Mathematical modeling and analysis of a hydrogen based internal combustion engine

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Abstract. The depletion of fossil fuels has raised an urgent demand for carrying out work for researchers and scientists to find an alternative fuel for a more stabilized emission and to minimize the environmental damage and their impact on the future generation. In the future, the energy system needs to be stabilized and has too renewable, sustainable, convenient, and efficient. The convection of all the combustion-based cars into the electric car may not be a suitable idea since the massive creation of the electricity in present technology is also a non-renewable source. So, research has come up with the idea of using alternative fuels in transportation to reduce carbon emissions and preserve fossil fuels for future generations. There is a variety of alternative fuels for an internal combustion engine. However, the hydrogen based internal combustion engine is estimated to be one of the most significant fuels in the near future to meet the stringent emission norms. The hydrogen usage in the internal combustion engine represents the alternation of petrol to produce the maximum amount of energy. In this paper, a study has been performed to understand the performance of the four-stroke hydrogen engine, which is compared with the standard four-stroke petrol engine to observe the energy supplied, energy losses by the exhaust gasses, thermal efficiency, and work done for both the engines.

Keywords: internal combustion engine, hydrogen engine, alternative fuel, carbon emission, combustion process, four-stroke engine.

1. Introduction

The hydrogen is the fuel of the future. As an avid researcher of alternative fuels and an ambitious chemistry student, this researcher understands the importance of a shift to a hydrogen economy. Hydrogen is an energy carrier that can be used in internal combustion engines produces virtually no greenhouse gas emissions when combusted with oxygen [1]. The only significant emission is water vapor. Hydrogen production and storage is currently undergoing extensive research. A solar-hydrogen system can provide the means of a totally emissions-free method of producing hydrogen. Although steam reformation of methane is currently the major route to hydrogen production, the emissions involved can also be controlled much more efficiently than our current system of transportation fuel [2]. The climatic change is a serious issues becoming increasing evident too much of the population. Rising CO2 levels have directly contributed to the global warming phenomenon. As shown in Figure 1 and Figure 2, the CO2 levels have rising dramatically in the past 200 years, along with the global average temperature [3]. The main region of the usage of the hydrogen is to reduce the NOx and the carbon components in the engine emission. Due to this emission the carbon content and the temperature are increasing the environment [4].

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Renewable Energy Systems for Sustainable Environment |

Optimization of engine parameters using NSGA II for the comprehensive reduction of emissions from VCR engine fuelled with ROME biodiesel

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Abstract

Diesel engines are most widely used as power plant for many applications, like automotive, agricultural purposes, portable machines and remote location power generation, because of their higher torque, power output, energy content per unit mass and cost of fuel. Because of the higher compression ratios, the diesel engines are able to produce greater cylinder pressures resulting in higher temperatures and thermal efficiency. On other hand, the diesel engines produce CO_x, NO_x, Soot and sulphur emissions which are harmful and these pollute the environment leading to acid rain, global warming and variety of human diseases. Also, the present emission regulations are framed such a way to ensure the environmental sustainability in addition to the economic and social importance. These constraints make the researchers find an alternate fuel for replacing the diesel fuel on the existing diesel engines for the reduction of environmental pollutions. Biodiesel is found to be a very good alternative fuel obtained from natural resources and having good energy with least possible emissions. Rubber seed methyl ester (ROME) is one kind of the biofuel can be used in the existing diesel without any engine modifications. The ROME is produced using trans esterification process and the biodiesel blends are prepared in the sequence of B20, B40, B60 and B80. The ROME is tested on the Variable Compression Ratio (VCR) engine to test the emission characteristic in line with the

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Effect of SiHGM reinforcements on the corrosion rate of Al 4032 MMC

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Available online 28 November 2021.

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Abstract

Al 4032 was being used as the material for manufacturing of pistons in automobiles and its usage was not limited only to pistons, but this material was being used in many structural and aerospace applications. The corrosive properties of Al 4032 have a major influence for adopting this material for long service life of the components. Hence, in this study an attempt was made to study the corrosive properties of Al 4032 and the composites manufactured by reinforcing silicon hollow glass <u>microspheres</u> (SiHGM) in Al 4032. The composites are fabricated using stir casting technique and their corrosive rate was studied by conducting electrochemical polarization test. From the results of the tests, the composites have shown better <u>corrosion resistance</u> when compared to the matrix material and the corrosion resistance of the composites has increased with the increase in amount of reinforcement.

Keywords

Al 4032; Stir casting; SiHGM; Corrosion; Potentiodynamic polarization

Design, Modeling & Simulation of A Thermoelectric Cooling System (TEC)

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ABSTRACT: Thermoelectric Devices are solid state devices which directly convert thermal energy to electrical energy and vice versa. In the recent past, a lot of effort has been made to improve the performance and also the power generated by a thermoelectric device. This is done by attaching heat sinks on either sides of the device. Optimizing heat sinks improves the overall efficiency of it but on the other hand the device also has to be optimized. TEC are mostly used for electronic cooling where the heated electronic devices serves as target that needs to be cooled while air acts as a heat sink with natural convection. In this paper, maximizing the cooling power of a TEC system has been studied and its effect with respect to variations in the TEC geometry has been discussed. 1D analytical model has been developed using Mathcad and a 3D model of the same has been numerically simulated using ANSYS whose setup used has been explained in detail. At low leg length of the TEC, the cooling power can be improved but a lot of other parameters have to be taken into account to accurately model the system. The contact materials used to electrically connect the device and the resistance of the conductor play a very important role while calculating the cooling power at low leg lengths and hence cannot be neglected. Results show that cooling power of the TEC can be dramatically improved at low leg lengths and with better heat sink material.

Key words: Design, Modelling, Simulation, TEC, ANSYS, Analytical Model

I. INTRODUCTION

Thermoelectrics is defined as the generation of electricity from a given temperature difference or vice versa. Solid state devices capable of producing power, these devices are environment friendly that come with low maintenance and reliability. They use a very simple concept of running on a temperature difference and as long as this criteria is being fulfilled, energy is produced. The concept of thermoelectricity can be classified into 2 parts. Thermoelectric Coolers (TEC) and Thermoelectric Generators (TEG). In order to run a TEC, a certain amount of current has to be input along with maintaining a temperature difference which gives a cooling power and the coefficient of performance of the device can then be measured. However, in a TEG, a load resistance is input along with maintaining a temperature difference and electricity is thus generated from these conditions. There have been quite a few number of applications in the recent past and the number of applications are increasing with time. Thermoelectrics has found its way into air conditioning systems, automobile applications, solar energy applications and many others.

History & Derivation of Thermo-Electrics

In 1821, Thomas Seebeck discovered that an electromotive force could be generated when a circuit was made out of two dissimilar materials and when the junction was heated. The electromotive force that was generated was named the Seebeck Effect. A few years later, Jean Peltier discovered that this same process could be reversed to produce heat when voltage was applied across the junction of two dissimilar materials [1]. In short, when current is passed through a circuit, one junction increases in temperature while the other junction cools down. A thermoelectric module is formed when a number of dissimilar materials are connected thermally in series and electrically parallel to each other [2]. At the end of the 19th century, electrons were discovered. And that was when the concept of thermoelectricity came to be clearer to the people working on it. We now understand that electrons can be liberated from any source even at temperatures as low as the room temperature. This is the reason we have electrostatics everywhere [1]. When a temperature difference is applied across a conductor, the hot region liberates more electrons and diffusion takes place from the hot side to the cold side. This distribution of electrons provoke the generation of an electric field which helps the electrons move from the hot side to the cold side due to Coulomb force. Therefore an electromotive force (emf) is generated which causes the current to move in the direction opposite to the flow of temperature. The same can be said about the opposite criteria as well. The movement of electrons due to the

Reconstruction and Segmentation Of Cancer Affected Patient's Lower Jaw, Developing Cad Model Of Cancer Part And Rapid Prototyping

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Abstract: Additive manufacturing is one of the latest manufacturing techniques which has the ability to generate complex parts. Our paper deals with application of this technique in the field of biomedical. This work concerns a type of bone cancer known as Osteosarcoma. A methodology has been proposed here in which Computer Tomography (CT) scan data is used to make a 3D model and the portion containing cancer is studied in Computer Aided Design (CAD) software. Different 3D printing parameters were changed to obtain a good quality part and respective time estimations were made. It was observed that bone implant in case of osteosarcoma can be easily fabricated using this method.

Key words: Cancer, Prototype, CT, CAD, 3D printing

I.   INTRODUCTION

3D printing is to manufacture any 3D data designed with CAD programs using a printer, by adding layers of material to a 3D physical part. 3D printing can be defined as additive manufacturing (AM) or layered manufacturing. 3D printing which has some techniques like selective laser sintering (SLS) material jetting, stereolithography (SLA), material extrusion and binder jetting etc. can be used for different materials and areas. It is interesting for many areas due to its success in the production of complex parts and the saving of material and time thanks to high-speed production. The effects of the developing technology can be seen in every field, from medicine to manufacturing. 3D printers have become a part of this developing technology. Although it is thought to be a very new technology for us, what is actually changed is that they are now more accessible and affordable than before. It is thought that 3D printing will move forward day by day thanks to the different facilities that provides for many different sectors. This technology, which is preferred especially for many applications in the field of health, provides great benefits especially for medical imaging and dental imaging, since it can largely manage studies such as medical device design and production that define the patient-specific anatomical structure. Applications using biocompatible materials such as the creation of tissue without any damage with living cells, blood vessel production, dental implants and special medical prostheses are just some of the contributions of the 3D printer to the biomedical field. In addition, this technology is also being researched in order to fix or replace defective organs such as kidneys, heart. Moreover, with this technology, organs that will perform the same biological functions as the original organs can be created. Thanks to this technology with organ and tissue printing, the future will be provided for many patients, and there is now a growing research effort focusing on the use of its research in a variety of biomedical applications. 3D printer technology has become a preferred application in many sectors, especially in recent years its use in biomedical applications has attracted attention. In this study, 3D technology is introduced and various 3D method are referred. The superior properties of the method and its use in biomedical applications are mentioned. The use of the method in surgical applications, medical imaging, pharmaceutical industry, production of patient-specific medical prostheses and implants, vet medicine applications, skin engineering and stem cell studies and organ printing were explained. In addition, this study includes the benefits of this technology which is expected to become widespread in the biomedical applications, the current challenges that need to be developed, trends and future opportunities.

Recently the use of 3D printing in the biomedical applications has been interesting for lots of researches. Many companies around the world have contributed to the increase in the use of this manufacturing method in the medicine with their laboratories and scientific researches. This technology offers significant benefits for biomedical applications and devices owing to the ability to

Cad Modelling of Human Ankle from CT and MRI Scan to Study the Bone Dislocation and Planning Operation Methodology by Using Slicing Software

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ABSTRACT: Recent findings show that 3DP is a versatile technology platform for numerous materials for mass customizable bone regeneration devices that are also getting approval from different regulatory bodies worldwide. After a brief introduction of different 3DP technologies, 3DP of different materials and devices for bone regeneration. From cell-based bioprinting to acellular patient-matched metallic or ceramic devices, 3DP has tremendous potential to improve the quality of human life through bone regeneration among patients of all ages.3D printing provides the end user with design freedom, part customization and the ability to print complex parts on demand. A case study on the various process parameters of 3D slicing and printing in bone regeneration of human ankle is presented here.

Key words: Ankle, Bone Dislocation, Slicing, 3DP, AM

I. INTRODUCTION

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II. BIOMEDICAL 3D PRINTERS

It can be expressed with many definitions such as "additive manufacturing" and "layered manufacturing". Although it has more than one definition, as we explained in our previous study, it is the method of adding main materials to layers that usually overlap to produce parts. Printing

Experimental Investigation on Effect of Layer Width on Dimensional Accuracy of FDM Build Parts

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ABSTRACT: 3D printing is emerging technology in advance manufacturing process. The main moto of the 3D printing is to achieve the most complex geometries accurately without effecting the features of the object within less time compare to conventional manufacturing. To build any component we need material and power source. Materials used in 3d printing are polymers, metals powders, ceramic powder etc… Material consumption is one of the important factors, here we are trying to optimize the consumption of material without effecting the features of the object before going for printing. most of the parameters effecting the material consumption and printing time among all the parameters like layer height, infill density, print speed and shell thickness etc... are majorly effecting parameters. Among these parameters line width or layer width also playing major role in consumption of material. Layer width in directly proportional to the material consumption which means increasing line width increases the material consumption and decrease in layer width decrease the material consumption. This line width directly effecting the printing time, bond strength and surface quality. Rapid increment and decrement of line width causes failure of print. In this study we are trying to optimize the material consumption and printing time by varying the line width for a constant layer height at different infill densities.

Key words: FDM, Density, 3D Printing, strength, surface quality.

I. INTRODUCTION

The potentials of additive manufacturing (AM) to produce the parts for various applications including prosthetics, automotive, intelligent structure and defence show its increasing recommendations. It is able to fabricate the parts using a variety of materials ranging from plastics to metals. Many AM systems are commercially available such as stereolithography apparatus (SLA), selective laser sintering (SLS), fused deposition modelling (FDM) and three-dimensional printing (3DP) for advanced applications. Among all available AM systems, FDM technology is the most widely used process for polymeric material. The major advantages of FDM technology are material availability, material diversity, cheaper, compact size and low working temperature. Based on the literature survey many studies also revealed some disadvantages of FDM technology such as surface properties, slow process and limits of dimensions. Researchers also performed the optimization of process parameters for avoiding limitations of FDM process. In every manufacturing process, the cost of process depends upon the material and energy consumption per part. Since 3d printing is advancing rapidly in manufacturing process, the material consumption per part varying depend on the process parameter like infill density, wall count, infill pattern, support material, support infill and brim count etc.. The cost of 3D printed part is varying depends upon the complexity of the geometry. If the complexity of the geometry of the increases cost also increases & vice versa. Since 3d printing is layered manufacturing process the, material consumption per each layer varies because material each layer contains cross sectional details of the geometry. The area of each cross section varies continuously and material and energy also consumption also varies. Compared with conventional manufacturing (CM), this unique fabricating approach largely simplifies and accelerates the production process without the requirements of moulds, dies and tools. Its feature of rapid prototyping provides users with an efficient manufacturing environment with higher material utilisation and lower time consumption. As opposed to subtractive manufacture (SM) such as CNC machining, AM is conducive to both thin-skin and light-weighted production with an alternative infill density and a higher material usage efficiency, rather than solid fabrication. The design freedom with limitless geometric constraints offers AM a broad application into customised productions, which allows users to personalise the processing parameters. To produce complex designs, AM avoids the tooling-related constraints with the assist of support structure, especially for the

Analysis of G-Code on FDM Build Parts to Achieve the Exact Height of CAD Model

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ABSTRACT: Additive manufacturing is the process of creating an object by building it one layer at a time. It is the opposite of subtractive manufacturing, in which an object is created by cutting away at a solid block of material until the final product is complete. Not every manufacturing process is the 100% efficient. In additive manufacturing also we have problems take care off before printing the model. Out of all the machine problems we have one more issue which we have taken care of slicing the model. When we slice the model, we have to consider the total height of the model and layer thickness. If, the layer height is not perfectly dividing the total height, we will get extra layers in the final printed model. These extra layers will consume extra energy and extra time. To avoid this extra material consumption and extra layer height we have rectified by editing the G-codes. Here we have modified the G code programme by using notepad. Here we have sliced the model with 0.1, 0.2, 0.3 0.4, 0.5 and 0.6mm layers of height. The final height of the component is calculated by reverse engineering the code and deleted the extra layer program and corrected it by replacing with the correct height programme layer.

Key words: FDM, G-Codes, CAD, AM, Slicing,

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Analysis of Effect of Process Parameters On Fused Deposition Modeling (FDM) Technique

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ABSTRACT: Rapid prototyping is a manufacturing process in which a computer-aided design (CAD) model is used to fabricate a physical model without the use of fixtures, tools, and human intervention. The prototype is made by deposition of material in layers. The major advantage of this manufacturing process is that it can fabricate complex part quickly with minimum loss of material. There are many rapid prototyping techniques available commercially. Fused deposition modelling (FDM) is one of the most widely acceptable methods in industry due to its simplicity of operation and ability to fabricate parts with locally controlled properties. However, the surface of the FDM parts shows a very low surface finish. In order to find out the effect of important factors that influence the process parameters on surface quality of spiralise contour and printing time and material consumption here we have done software runs to find the better printing parameters. Spiralise contour majorly used to prepare the casting patters and covering bodies of electronic gadgets and many more application. Here we are studying the process parameters effecting the quality of the print and printing time and consumption of material has been studied. The spiralise contour makes the solid print to outer layer print with constant increment in Z axis. Due to spiralise print the model majorly wall count, shell thickness, print speed will be effected directly. To control the quality of the final print part layer thickness, wall count, line width, print speed will play major role. Fused deposition modeling (FDM) is one of the RP techniques in which a plastic filament is melted in the extruder of the 3D printer and deposited on the build platform of the 3D printer to form the object layer by layer. Part quality and mechanical properties of the FDM fabricated parts extensively depends on process variable parameters such as layer thickness, raster angle, part orientation, raster width, air gap. Hence, selection and optimization of FDM process parameters is vital. The aim and objective of this article is to study and determine the influence of these parameters on processed part through the research work carried out so far. A number of optimization techniques and designs of experiments for the determination of optimum process parameter have been studied.

Key words: Rapid prototyping, FDM, 3D Printing, Optimization, DOE, CAD.

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Design and Analysis of Camshaft & Development of CAM Code for Die Manufacturing

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ABSTRACT: The camshaft and its associated parts control the opening and closing of the two valves. The associated parts are push rods, rocker arms, valve springs and tappets. This shaft also provides the drive to the ignition system. The camshaft is driven by the crankshaft through timing gears. Cams are made as integral parts of the camshaft and are designed in such a way to open the valves at the correct timing and to keep them open for the necessary duration In this paper a cam shaft is designed for PS 24/2 stationary multi cylinder engine by using theoretical calculations. Based on theoretical calculations, a 3D model of the camshaft is created using Unigraphics software. Static structural analysis is done using ANSYS with two different materials such as structural steel and aluminum alloy 7475 (AL 7475) to determine displacements and stresses developed in the camshaft. Core & Cavity is extracted for the cam shaft and CNC program is generated for both core and cavity using NX design software.

Key words: Design, Analysis, CAM, Die manufacturing, CNC

I. INTRODUCTION

A cam is a rotating or sliding piece in a mechanical linkage used especially in transforming rotary motion into linear motion or vice versa. It is often a part of a rotating wheel (e.g. an eccentric wheel) or shaft (e.g. a cylinder with an irregular shape) that strikes a lever at one or more points on its circular path. The cam can be a simple tooth, as is used to deliver pulses of power to a steam hammer, for example, or an eccentric disc or other shape that produces a smooth reciprocating (back and forth) motion in the *follower*, which is a lever making contact with the cam. The cam can be seen as a device that translates from circular to reciprocating (or sometimes oscillating) motion. A common example is the camshaft of an automobile, which takes the rotary motion of the engine and translates it into the reciprocating motion necessary to operate the intake and exhaust valves of the cylinders. The opposite operation, translation of reciprocating motion to circular motion, is done by a crank. An example is the crankshaft of a car, which takes the reciprocating motion of the pistons and translates it into the rotary motion necessary to operate the wheels. Cams can also be viewed as information-storing and -transmitting devices. Examples are the cam-drums that direct the notes of a music box or the movements of a screw machine's various tools and chucks. The information stored and transmitted by the cam is the answer to the question, "What actions should happen, and when?" (Even an automotive camshaft essentially answers that question, although the music box cam is a still-better example in illustrating this concept.) Certain cams can be characterized by their displacement diagrams, which reflect the changing position a roller follower would make as the cam rotates about an axis. These diagrams relate angular position to the radial displacement experienced at that position. Several key terms are relevant in such a construction of plate cams: base circle, prime circle (with radius equal to the sum of the follower radius and the base circle radius), pitch curve which is the radial curve traced out by applying the radial displacements away from the prime circle across all angles, and the lobe separation angle (LSA - the angle between two adjacent intake and exhaust cam lobes). Displacement diagrams are traditionally presented as graphs with non-negative values. A camshaft is a shaft to which a cam is fastened or of which a cam forms an integral part. An early cam was built into Hellenistic water-driven automata from the 3rd century BC. The camshaft was later described in Iraq (Mesopotamia) by Al-Jazari in 1206. He employed it as part of his automata, water-raising machines, and water clocks such as the castle clock. The cam and camshaft later appeared in European mechanisms from at least the 14th century, or possibly earlier.

Figure 1.1 Computer animation of a camshaft operating valves

Modeling and Damping Analysis of High Grade Steel Alloy Drive Shaft in Automobile

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ABSTRACT: A drive shaft is a mechanical component for transmitting torque and rotation, usually used to connect other components of a drive train that cannot be connected directly because of distance or the need to allow for relative movement between them. As torque carriers, drive shafts are subject to torsion and shear stress, equivalent to the difference between the input torque and the load. The functions of the driveshaft are it must transmit torque from the transmission to the differential gear box. The drive shafts must also be capable of rotating at high speeds required by the vehicle. The drive shaft must also operate through constantly changing angles between the transmission, the differential and the axles. The length of the drive shaft must also be capable of changing while transmitting torque. High strength steel is a new generation of steel material exhibiting improved properties over conventional steel grades. The Drive Shaft of the rough terrain vehicle (BAJA) suffered from a dynamic instability problems due to the nature of rigorous instability on rough terrain. This problem is inherent to study the vibration properties of the drive shafts as they tend to break down causing severe shaft dynamic loading. The multidisciplinary problem of drive shaft dynamics was to be addressed accurately in the time/frequency domain using traditional "strike method" of testing structures with modally tuned impulse hammer and data acquisition system. Modal testing is conducted with FFT Analyser using impact hammer as input force transducer and accelerometer to record the output signals. CAD modelling of drive shaft is done using available drawings & dimensions. FE simulation of drive shaft is carried out to solve modal analysis. Validating and comparing the result of both FE analysis and experimental modal analysis.

Key words: Damping, HSS, Steel alloy, Vibration, FEA

I. INTRODUCTION

A drive shaft is a mechanical component for transmitting torque and rotation, usually used to connect other components of a drive train that cannot be connected directly because of distance or the need to allow for relative movement between them. As torque carriers, drive shafts are subject to torsion and shear stress, equivalent to the difference between the input torque and the load. They must therefore be strong enough to bear the stress, whilst avoiding too much additional weight as that would in turn increase their inertia.

An automobile may use a longitudinal shaft to deliver power from an engine/transmission to the other end of the vehicle before it goes to the wheels. A pair of short drive shafts is commonly used to send power from a central differential, transmission, or transaxle to the wheels. An automotive drive shaft transmits power from the engine to the differential gear of a rear wheel drive vehicle. The torque capability of the drive shaft for passenger cars should be larger than 3500 Nm and the fundamental

bending natural frequency should be higher than 9200 rpm to avoid whirling vibration. In front-engine, rear-drive vehicles, a longer drive shaft is also required to send power the length of the vehicle.

An automotive drive shaft transmits power from the engine to the differential gear of a rear wheel drive vehicle. The drive shaft is usually manufactured in two pieces to increase the fundamental bending natural frequency because the bending natural frequency of a shaft is inversely proportional to the square of beam length and proportional to the square root of specific modulus which increases the total weight of an automotive vehicle and decreases fuel efficiency. The torque that is produced from the engine and transmission must be transferred to the rear wheels to push the vehicle forward and reverse. The drive shaft must provide a smooth, uninterrupted flow of power to the axles. The drive shaft and differential are used to transfer this torque.

The Drive Shaft of the rough terrain vehicle (BAJA) suffered from a dynamic instability problems due to the nature of rigorous instability on rough terrain. This problem

Development and Reconstruction of Spinal Cord from CT Scan Files and RPT Estimation Analysis

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ABSTRACT: Rapid Prototyping (RP) is an emerging technology, especially in a Three-Dimensional Printing (3DP) application. 3DP is used in many fields such as aeronautical, automotive, architecture, medical, and many others. 3DP can be effectively used in anatomical education for medical students who are pursuing their undergraduate degrees. It can also be used for pre-operative surgical planning by experts before surgery. Some complex organs of the human body which cannot be seen visible even after dissection of the cadaver can be printed using a 3D printer which provides haptic studies on organs and bones to students. These 3D printed parts can be used in pre-operative planning such as analysis and diagnosis formulation of affected organs. Further, it can be used in explaining the operative procedures to patients which helps them to understand and co-operate with the medical procedures. Therefore, this paper aims at 3DP of complex organs and bones for anatomical studies and pre-operative planning procedures. As a first step in the work, some of the human bones were printed and analysed for its quality.

Key words: CT Scan, RPT, 3D Printing, Complex organs.

I.   INTRODUCTION

Rapid Prototyping (RP) is a technology that will construct scale models of the prototype from its 3D Computer-Aided Design (CAD) data. Unlike the subtractive process which will remove material to fabricate a part, 3D Printing (3DP) is based on an additive process that adds layer by layer material to the substrate for constructing the whole model. In manufacturing sectors, a lot of time required for fabricating a prototype, patterns, and molds with many complex processes. To reduce the manufacturing time and to avoid the complexity, industries have started using 3DP techniques to produce a complex pattern, molds, and prototypes. In subtractive process, tool movements are planned for material removing from work piece to attain the desired shape compare to subtractive process like milling, turning and machining, AM technology has the most capabilities to get the complex geometries such as anatomical structures. RP provides cost- effective models of the designs that will be used to realize the product before the fabrication of expensive prototypes. Various types of RP techniques include Stereolithography (SLA), Selective Laser Sintering (SLS), Fused Deposition Manufacturing (FDM), Laminated Object Manufacturing (LOM) and Ballistic Particle Manufacturing (BPM). 3D printing is a technique that will print the molten material layer by layer to form an entire 3D structure of a physical part. The 3D model created by CAD software will be converted to. STL format. The STL format was developed by Hull at 3D

systems and it is being used as the gold standard for the data transfer between CAD software and the 3D printer. Medical applications of 3D printing include printing of customized implants and prostheses like titanium mandibular prosthesis, skull implant, orthopedic implants, maxillofacial, spinal, hearing aids, Invisalign braces, neuroanatomical models and dental implants. Many researchers have tried to print knee meniscus, heart valve, spinal disk, cartilage tissues, bone, artificial ear, artificial liver and bio-resorbable tracheal splint. For example, 3D printing of a prosthetic socket with respect to the patient's residual limb was done using the rapid prototyping technique. The patient's limb was scanned using the 3D scanner and digital data was processed using TracerCAD software and SolidView Pro and then after rectification, it was printed using Z corporation Z402 3D printer. An anatomical study is very important for the postgraduate specialist to get surgical training. It is the required field of study for students practicing medicine. The knowledge obtained from anatomical study can be effectively used in the examination and diagnosis studies. This knowledge can be further used in explaining the operative procedures clearly to patients. Anatomical errors lead to litigation problems. Anatomical knowledge obtained from anatomical studies will avoid those errors. It provides the students to have haptic studies on 3D anatomy. Various teaching aids have been used for anatomical studies such as dissection by students, prosecution and demonstration, didactic teaching, models, technologies (Computer Aided Learning (CAL),

Experimental Analysis on Optimization of Process Parameters in Fused Deposition Modelling

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ABSTRACT: The 3D printing process is a kind of additive manufacturing, that the basic principle of this process is adding material layer by layer to form a product. The purpose of this research was to study the effect of orientation and internal over hangs on micro heat exchanger. In this we are optimizing the printing orientation to avoid the warpage of micro heat exchanger printing and decreasing the ovality of the circular tube by orienting. In this case study we are optimizing the orientation with constant layer height of 0.1mm to achieve the dimensional accuracy of internal features of micro heat exchanger. By the end of the study, the orientation effect on the micro heat exchanger will be deduced. In addition to that effect of various process parameters can be calculated.

Key words: Optimization, 3D Printing, Slicing, Modelling

I. INTRODUCTION

3D printing or Additive Manufacturing (AM) is any of various processes for making a three-dimensional object of almost any shape from a 3D model or other electronic data source primarily through additive processes in which successive layers of material are laid down under computer control. A 3D printer is a type of industrial robot. Early Additive Manufacturing equipment and materials were developed in the 1980s. In 1984, Chuck Hull of 3D Systems Corp, invented a process known as stereolithography employing UV lasers to cure photopolymers. Hull also developed the Standard Triangular language file format widely accepted by 3D printing software, as well as the digital slicing and infill strategies common to many processes today. Also during the 1980s, the metal sintering forms of Additive Manufacturing were being developed (such as selective laser sintering and direct metal laser sintering), although they were not yet called 3D printing or Additive Manufacturing at the time. In 1990, the plastic extrusion technology most widely associated with the term "3D printing" was commercialized by Stratasys under the name Fused Deposition Modelling (FDM). In 1995, Z Corporation commercialized an MIT-developed additive process under the trademark 3D printing (3DP), referring at that time to a proprietary process inkjet deposition of liquid binder on powder.

Additive Manufacturing technologies found applications starting in the 1980s in product development, data visualization, rapid prototyping, and specialized manufacturing. Their expansion into production (job production, mass production, and distributed manufacturing) has been under development in the decades since. Industrial production roles within the metalworking industries achieved significant scale for the first time in the early 2010s. Since the start of the 21st century there has been a large growth in the sales of AM machines, and their price has dropped substantially

Applications are many, including architecture, construction, industrial design, automotive, aerospace, military, engineering, dental and medical industries, biotech (human tissue replacement), fashion, footwear, jewellery, eyewear, education, geographic information systems, food, and many other fields.

3D printable models may be created with a Computer-Aided Design (CAD) package, via a 3D scanner, or by a plain digital camera and photogrammetry software. 3D printed models

1.2 3D Printer

3D-Printer is a machine reminiscent of the Star Trek Replicator, something magical that can create objects out of thin air. It can "print" in plastic, metal, nylon, and over a hundred other materials. It can be used for making nonsensical little models like the over-printed Yoda, yet it can also print manufacturing prototypes, end user products, quasi-legal guns, aircraft engine parts and even human organs using a person's own cells. We live in an age that is witness to what many are calling the Third Industrial Revolution. 3D printing, more professionally called additive manufacturing, moves us away from the Henry Ford era mass production line, and will bring us to a new reality of customizable, one-off production. 3D

Experimental Investigation of Surface Finish Enhancement of Fused Deposition Modelled Parts

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ABSTRACT: 3D printing is a promising digital manufacturing technique that produces parts with layer by layer. The influence of process parameters is investigated for PLA material in fused deposition modelling (FDM). This work aimed to determine what are the printing process parameters effect the surface roughness of printing parameters. Major influencing parameters are wall count, top and bottom closing layers effecting the surface roughness when the infill density is less than 100%. Wall count, top and bottom closing layers are need to increased when the wall count decreases. By increasing the wall count, top and bottom closing layers the strength of the component increases. But the material consumption and printing time increases.

Key words: 3DP, PLA, Wall count, layers, Granular material

I.   INTRODUCTION

3D printing or additive manufacturing (AM) is any of various processes for making a three-dimensional object of almost any shape from a 3D model or other electronic data source primarily through additive processes in which successive layers of material are laid down under computer control. A 3D printer is a type of industrial robot. Early AM equipment and materials were developed in the 1980s. In 1984, Chuck Hull of 3D Systems Corp, invented a process known as stereo-lithography employing UV lasers to cure photopolymers. Hull also developed the STL file format widely accepted by 3D printing software, as well as the digital slicing and infill strategies common to many processes today. Also during the 1980s, the metal sintering forms of AM were being developed (such as selective laser sintering and direct metal laser sintering), although they were not yet called 3D printing or AM at the time. In 1990, the plastic extrusion technology most widely associated with the term "3D printing" was commercialized by Stratasys under the name fused deposition modelling (FDM). In 1995, Z Corporation commercialized an MIT-developed additive process under the trademark 3D printing (3DP), referring at that time to a proprietary process inkjet deposition of liquid binder on powder. AM technologies found applications starting in the 1980s in product development, data visualization, rapid prototyping, and specialized manufacturing. Their expansion into production (job production, mass production, and distributed manufacturing) has been under development in

the decades since. Industrial production roles within the metalworking industries achieved significant scale for the first time in the early 2010s. Since the start of the 21st century there has been a large growth in the sales of AM machines, and their price has dropped substantially. According to Wohlers Associates, a consultancy, the market for 3D printers and services was worth \$2.2 billion worldwide in 2012, up 29% from 2011. Applications are many, including architecture, construction (AEC), industrial design, automotive, aerospace, military, engineering, dental and medical industries, biotech (human tissue replacement), fashion, footwear, jewellery, eyewear, education, geographic information systems, food, and many other fields.

1. 1 3D Printer

3D-Printer is a machine reminiscent of the Star Trek Replicator, something magical that can create objects out of thin air. It can "print" in plastic, metal, nylon, and over a hundred other materials. It can be used for making nonsensical little models like the over-printed Yoda, yet it can also print manufacturing prototypes, end user products, quasi-legal guns, aircraft engine parts and even human organs using a person's own cells. We live in an age that is witness to what many are calling the Third Industrial Revolution. 3D printing, more professionally called additive manufacturing, moves us away from the Henry Ford era mass production line, and will bring us to a new reality of customizable, one-off production. 3D printers use a variety of very different types of additive

Reconstruction of Knee Joint by Using 3 Matics and Mimics and Design and Analysis of Knee Joint Plate for Maximum Loading Condition

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ABSTRACT: The mechanical stress determination in human femur bone is of great importance in both research and clinical practice. One of the methods to estimate stress is through finite element modeling. In spite of that, the modeling technique has to be validated by an experimental approach as it is the best tool to access the accuracy of finite element model predictions. However, in the previous studies, this validation has not been carried out extensively due to limited number of studies available and the difficulties of the experiment procedure. The aim of this paper is to develop an experimental method in order to determine the maximum stresses at the surface of the bone prototype under normal loading. An experiment is conducted where load is applied at the femoral head and the maximum stress on the bone surface is determined with the presence of strain gauges. Three-dimensional (3D) printing technology has received great attention in the past decades in both academia and industry because of its advantages such as customized fabrication, low manufacturing cost, and unprecedented capability for complex geometry, and short fabrication period. 3D printing of metals with controllable structures represents a state-of-the-art technology that enables the development of metallic implants for biomedical applications. To develop the CAD model of knee joint we have used the CT scans of the knee joint and developed in the mimic's software. To design the knee joint implants, we have used 3Matics software. From here we can analysis the knee joint and plans the surgical operations. We can manufacture the suitable implant for specific patient requirement so that the surgical time will be reduced. The structural analysis has been performed using Altair inspire Optistruct software for human weight.

Key words: Knee joint, 3 Matics, Mimics, 3D Printing, CT scan, CAD

I. INTRODUCTION

This paper investigates the suitability of using RP technology and associated medical software solutions to transfer 2D Digital Imaging and Communications in Medicine (DICOM) data into 3d Standard Triangle Language (STL) data. This data is then utilized using medical software solutions to manufacture preoperative planning models and customized medical implants for the benefit of patients and surgical planning teams alike. The work also gives an overview of relevant subject matter such as medical scanning, RP, preoperative planning models, customized implants/jigs and biocompatible materials. Case studies are included as a method of illustrating how the different technologies integrate and function to produce tangible successful outcomes that make a significant difference in medical interventions.

Prior to RP the production of medical models of individual patients was very rare due to the difficulty and cost of generating (usually by CNC machining) complex geometry associated with anatomy. Medical implants were manufactured using pressing, forging, machining and casting processes. Unfortunately, due to the limitations of the manufacturing processes this often resulted in bulky, poorly fitting and costly implants. With the introduction of RP technology, these types of problems were solved using the additive manufacturing (AM) or "layer by layer" process. Building intricate geometrical parts suddenly became less problematic and cheaper this helped RP technology gain acceptance by the medical profession.

Production of Anatomical Models from CT Scan Data by JOHN BRENAN

In this paper the latest medical data processing software tools will be used to generate models for preoperative

Optimization of Support Structures to Minimize the Displacement of Standard ASTM E8 Tensile Specimen

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ABSTRACT - The purpose of this study is to study the influence of the laser power and the scanning speed on the surface hardness, and top surface and side surface roughness of Ti-6Al-4V metal specimens fabricated via the selective laser melting (SLM) technique. The laser power was varied between 150 and 300 W while the scan speed was varied between 800 and 1400 mm/s. Response surface methodology (RSM) in the Design Expert 11 software environment was used for the design of experiment and results analysis. The distance for surface indentations were targeted at 10–20 µm for the top surface and 60–80 µm for the side surface while the surface hardness profiling was studied using an indenter with the indentation performed at a load of 500 gf and at a dwelling time of 15 s. The study revealed that as the laser power was increased, the surface hardness increases, while the top surface and side surface roughness reduces. Then, when the scanning speed increased, the surface hardness, and top surface and side surface roughness were found to also increase. The optimum range of the process parameters selected are laser speed 300 W and scan speed 1400 mm/s. This produces a minimum surface roughness of 13.006μm for the top surface roughness and 62.166 µm f o r the side surface roughness with a corresponding hardness value of 409.391 HV. The findings of this study will assist manufacturers in the process design of the SLM of titanium alloy for aerospace applications.

Key words: Optimization, ASTM E8, RSM, SLM, Titanium alloy

I.   INTRODUCTION

The laser power and scan speed played contradicting roles in the resultant roughness and porosity. An appropriate increase in laser power and decrease in scan speed could reduce the surface roughness and simultaneously improve the density and dimensional accuracy. Additive Manufacturing (AM) is defined as the manufacturing process to build three dimensional objects by adding layer-upon-layer of material. The process starts with a computer-aided-design (CAD) file that includes information about how the finished product is supposed to look. The material can be plastic, metal, concrete or even human tissue. AM is achieved using an additive process, where successive layers of material are laid down in different shapes. It is also considered different from traditional machining techniques that mostly depend on the removal of material by subtractive processes like milling or lathing. All AM technologies involve a series of steps that move from the virtual three-dimensional   geometric representations to the physical resultant part. Due to variety of the product demands and the level of complexity, AM involves in process development in different ways and different degrees. Furthermore, in the early stages of product development of small and relatively simple products AM is

used for a simple fabrication of visualization model while in later stages the larger and more complex parts require certain technology and possible post processing activities for the final form of the product. Regardless the case, the construction process of all AM technologies follows to some degree at least the same principle generic process sequence.

According to Gibson (2010) eight key steps can be defined as the generic process of AM:

- •   Conceptualization and CAD
- •   Conversion to STL
- •   Transfer and manipulation of STL file on AM machine
- •   Machine setup
- •   Build
- •   Part removal
- •   Post processing of part
- •   Application

All AM parts must begin from virtual model designed on software describing the external geometry in detail. The output of the first step should be an STL file format given information of the external surface and the basic calculations of the slices of the part. At the next stage the part is transferred to an AM process software where is been

A Computational Fluid Dynamics Study and Heat Transfer in A Micro Channel

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ABSTRACT: A theoretical study of single phase microchannel heat exchanger has been carriedout. The computational fluid dynamics (CFD) model equations are solved to predict the hydrodynamic and thermal behaviour of the exchanger. The geometry of the problem and meshing of it have been made in ANSYS Workbench. The models have been solved by ANSYS Fluent 12.0 solver. The utility of nonmaterial as a heat enhancer has been justified by studying a circular microchannel thermal behaviour. Water and its nanofluids with alumina (Al_2O_3) are used as the coolant fluid in the microchannel heat sink. The present CFD calculated heat transfer coefficient values have compared with the analytical values and very close agreement is observed. The result shows that nanofluids help to increase the heat transfer coefficient by 15% and 12% respectively in laminar and turbulent zone. Thus use of nanofluids has been found beneficial both in laminar and turbulent zone. The relation between heat transfer coefficient and thermal conductivity of the fluid i.e. h is proved in the present study.

Key Words: microchannels, heat exchangers, nanoparticles, nanofluids, Fluent, CFD, heat transfer coefficient, pressure drop, friction factor.

I.   INTRODUCTION

Heat sinks are classified into single-phase or two-phase according to whether boiling of liquid occurs inside the micro channels. Primary parameters that determine the single phase and two-phase operating regimes Over the last decade, micromachining technology has been increasingly used for the development of highly efficient cooling devices called heat sink because of its undeniable advantages such as less coolant demands and small dimensions. One of the most important micromachining technologies is micro channels. Hence, the study of fluid flow and heat transfer in micro channels which are two essential parts of such devices, have attracted more attentions are heat flux through the channel wall and coolant flow rate. For a fixed amount of heat flux (heat load), the coolant may maintain its liquid state throughout micro- channels. With a lower flow rate, the flowing liquid coolant inside the channel may reach its boiling point and thus flow boiling occurs, which results in a two-phase heat sink.

MICROCHANNEL AND ITS USE

Tuckerman and Pease (1981) first made use of miniaturization for the purposes of heat removal, within the scope of a Ph.D. study in 1981. Their publication titled "High Performance Heat Sinking for VLSI" is credited as the first study on microchannel heat transfer.

Their pioneering work has motivated many researchers to focus on the topic and microchannel flow has been recognized as a high performance heat removal tool ever since. Before proceeding with microchannel flow and heat transfer, it is appropriate to introduce a definition for the term "microchannel". The scope of the term is among the topics of debate between researchers in the field. Mehendale et al. (2000) used the following classification based on manufacturing techniques required to obtain various ranges of channel dimensions, "D", being the smallest channel dimension:

As is evident from the diversity of application areas, the study of flow and heat transfer in microchannels is very important for the technology of today and the near future, as developments are following the trend of miniaturization in all fields. Literature shows that the microchannels and microchannels heat sinks were studied extensively, , this work studies the CFD simulation of micro channel flow and conjugates heat transfer, which couples fluid convection in a rectangular micro channel and heat conduction in the solids.

The present work is undertaken to study the following aspects of

1.   Computational Fluid Dynamics modeling and simulation of single phase microchannel heat

Performance Improvement of an Organic Rankine Cycle with Low Grade Thermal Energy Input From A Compound Parabolic Collector

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ABSTRACT -Solar energy collectors have been the need of the hour for the past couple of decades as the world has been desperately trying to find new and innovative ways to shift the dependency on fossil fuel to clean and green energy sources for power generation. The aim of the present study is two folds modelling of "Compound Parabolic Collector" and studying its contribution in the performance improvement of "Organic Rankine Cycle" engine for different ambient and operating conditions. Compound Parabolic Collectors (CPC) are mostly used for low temperature applications such as process heating, waste heat recovery etc., but with integration of the same to a proper heat engine, considerable amount of work output can be obtained. A concentration ratio of 2 was employed for the CPC, to have a higher acceptance angle so that maximum amount of solar radiation can be focussed on to the absorber. This also eliminates the use of tracking for the collector. The CPC module used for this study is the tubular absorber module. The performance of the CPC has been modelled with the use of a CFD tool, namely "Ansys". The physical and the mathematical models are also discussed in details. The model generated has been validated with similar experimental work. The use of ORC for the generation of work from the CPC unit has been explored in the second part of this study. The overall heat loss coefficient and the heat losses from the collector have been expressed as a function of the outlet temperature of the CPC unit. The effect of the solar radiation intensity, mass flow rate of the working medium, inlet temperature of the working medium has been discussed in the results. Finally, the thermal efficiency and the optical efficiency of the collector have been expressed as a function of the outlet temperature of the working medium. The thermal efficiency has been found to be in the range of 60-80% at a maximum temperature of 100° C as attained from the computational study for varying solar radiation (700-1500) W/m2. The performance of the ORC has been studied with the help of "Engineering equation solver". The effects of parameters such as pressure ratio, condenser or the cold side temperature are discussed in the results. The effect of incident solar radiation of the CPC on the efficiency of the ORC has been studied. The efficiency of the ORC cycle with the CPC unit as the heat source has been found and compared with a conventional ORC cycle. The efficiency of the ORC with a suitable working medium for the study has been found to be 13.03%. The ORC with CPC as the heat input showed considerable improvement in thermal efficiency over the conventional ORC unit where the later had an efficiency of 9 %. The present study illustrates the significance of low-grade process heat in the improvement of the performance of ORC.

Key words: CPC, CFD, ORC, Modelling, Solar energy collector

I. INTRODUCTION

The sun is a massive celestial object with a diameter of 1.39×109 m. The solar energy hits earth for a mere 8 min and 20 seconds after leaving the giant star, which is 1.5×1011 m away from the green planet. The sun hasan effective blackbody temperature of 5762 K. The temperature in the central region is much higher and it is estimated at 8×106 to 40×106 K. The sun is a continuous fusion reactor in which hydrogen is turned into helium. The sun's total energy output is 3.8×1020 MW which is equal to 63 MW/m2 of the sun's surface. This energy radiates outwards in all directions. Only a tiny

Design and Analysis of Aircraft Telescopic Wing and Material Optimization

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ABSTRACT: The development of morphing wing technologies for flight regime adaptation has received great interest from Researchers and engineers in the past years. This paper is in one such research where we have designed a morphing wing structure to our aircraft to adaptive mechanisms and structures. Morphing can encompass many aspects of the aircraft design, including the location, shape, area and angle of the wings, tail or fuselage. Our approach towards the work is to develop new concepts and technology thus enhances the overall flight performance of aircraft, enabling new approaches to the design of aircraft and improving multi-mission flexibility. We want to develop an aircraft with a morphing wing in a high-performance aircraft that can operate efficiently in multiple flight conditions by Changing in its material and thus finding the best material to improve overall performance.

Key words: Aircraft, optimization, telescopic wing, material

I. INTRODUCTION

Morphing changing ones image into another through a seamless transition. Morphing is generally achieved using either smart materials (materials which have one or more properties that can be significantly changed, in a controlled manner, by external stimuli), or structural morphing. The literature study of the paper through some of the resent designs shows that the morphable wing having more scope in the fields of improved aircraft performance for extent its flight envelope, extent performance reduced drag, vibration and improved range. Morphing changing ones image into another through a seamless transition. Morphing is generally achieved using either smart materials (materials which have one or more properties that can be significantly changed, in a controlled manner, by external stimuli), or structural morphing. And here we are using the composite material as the material for the wing design, large deformations of the morphing aircraft the orthotropic properties of composite material is used.

II. TELESCOPIC WING

External Telescoping Wing Section With Rectangular Platform

This concept involves rectangular inboard and outboard wing sections as shown in Figure, allowing for uniform cross sections within each wing segment. The outboard section must have a hollow cross section to allow the outboard section to slide over the inboard section. This will reduce the wing structural weight in the outboard section, but will also result in the outboard section having a greater chord than the inboard section. Consequently, the taper

ratio for the entire wing would be greater than one, resulting in increased lift generation at the wingtip.

Internal Telescoping Wing Section With Rectangular Platform

This concept involves rectangular inboard and outboard wing sections shown in Figure, allowing for uniform cross sections within each wing segment. The inboard section must have a hollow cross section for the majority, if not the entire, inboard span. This arrangement allows the outboard section to retract within the inboard section and gives the overall wing platform a taper ratio of less than one due to the reduction of chord between the inboard and outboard sections required for structural supports. The hollow cross section of the inboard wing will result in reduced structural integrity.

Tapered Inboard Platform With Internal Telescoping Rectangular Wing Tip

This concept involves a tapered inboard section and a rectangular outboard wing section as shown in Figure, requiring varying cross sections within the inboard wing segment. The inboard section must have a hollow cross section for the majority, if not the entire, inboard span. This arrangement allows the outboard section to retract within the inboard section and gives an overall wing platform taper ratio of less than one. The hollow cross section of the inboard wing will result in reduced structural integrity. However, the increased root chord will improve the structural integrity of the wing. This wing will not benefit from the usual structural benefit of reducing weight towards

Reconstruction, Segmentation and Smoothing of Tibia and Fibula Parts from Knee Joint Assembly and RPT Estimation and Material Consumption

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ABSTRACT: Medical images are essential tools for medical practitioner and specialists to use when diagnosing problems and diseases in the body. These images from CT and MRI scans are converted into 3D CAD model and based on 3D model, reconstruction of knee joint is being made for medical applications. Hence, in this paper an attempt is made to create a 3D reconstructed anatomy structure based on real medical images of a patient so that practitioner can study the 3D anatomy structure from real medical images. The 3D slicer workbench is used for generating a 3D model of the anatomy and problems from medical images. The model was created by combining segmentation and smoothing techniques using slicer software. The segmented part is exported as STL file directly. The STL file is sliced for FDM process prototyping. The segmented part sliced for different layer heights to study the printing time and material consumption. We have sliced the model in Ultimaker CURA 4.0.0. PLA (Polylactic Acid) is used for printing Tibia and Fibula because of its biocompatibility, biodegradability, non-toxic, non-immunogenic and non-inflammatory properties towards the human body.

Key words: Segmentation, Tibia, Fibula, Knee, RPT, CURA

I. INTRODUCTION

The increasing use and improvement of occupant restraint systems have reduced fatality and severe injury rates in motor vehicle crashes (MVCs), but the protection of the lower extremity (LE) was not improved as much as that of the head and chest [1]. LE injuries still account for 36% of all AIS2+ injuries sustained by front seat occupants in all frontal crashes [2]. Even though LE injuries are usually not fatal, they can lead to costly rehabilitation and disability, which is a heavy burden for the family and community.

Tibia is the shin bone and bears the majority of weight between the knee and the ankle. Lateral to (on the outer side of) the tibia is the fibula, a smaller long bone that provides stability and assists with rotation of the ankle. The tibia is a long bone, which means it is a limb bone that is longer than it is wide.

Femur and tibia fractures are commonly seen in MVCs and cortical bones are believed to have a dominant effect on bone strength, as they serve as a damage-tolerant structural framework [3]. Aging can cause changes in the shape, size, and cortical thickness of bones and thus lead to increased incidence of bone fractures [4]. Other factors such as stature and body mass index (BMI), can also affect bone morphology [5-9].

Finite element (FE) models are powerful and effective tools to assess human impact responses in MVCs and reproduce bone fractures. Multiple FE femur and tibia models have been developed previously. References [10-12] reported detailed LE models using the geometry extracted from CT and/or magnetic resonance imaging (MRI) data. However, their models could not reflect the variation in cortical bone thickness among the population, and a method to estimate the cortical bone thickness from CT scans was not reported.

Reference [8] did a comprehensive job on the development of parametric femur FE models, and the population variation in cortical bone thickness was considered. They used a fixed global thresholding method similar to [13] to segment the cortical bone from clinical CT scans, and the thickness was determined based on the distance between the outer and inner cortical surfaces along the normal direction. However, the estimated cortical thickness values were sensitive to the specified threshold, and may introduce significant errors in thin-cortex areas.

In the field of medical image process, several cortex thickness estimation techniques based on clinical CT scans have been proposed, such as the 50% relative threshold method [14-15]. This method considered bone

Product Design and Development Using 3D Technology By Fused Deposition Modelling

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ABSTRACT - 3D printing is a form of additive manufacturing technology where a three-dimensional object is created by laying down successive layers of material. It is also known as rapid prototyping, is a mechanized method whereby 3D objects are quickly made on a reasonably sized machine connected to a computer containing blueprints for the object. The 3D printing concept of custom manufacturing is exciting to nearly everyone. This revolutionary method for creating 3D models with the use of inkjet technology saves time and cost by eliminating the need to design; print and glue together separate model parts. Now, you can create a complete model in a single process using 3D printing. The basic principles include materials cartridges, flexibility of output, and translation of code into a visible pattern. 3D Printers are machines that produce physical 3D models from digital data by printing layer by layer. It can make physical models of objects either designed with a CAD program or scanned with a 3D Scanner. It is used in a variety of industries including jewelry, footwear, industrial design, architecture, engineering and construction, automotive, aerospace, dental and medical industries, education and consumer products.

Key words: Product design, 3D Technology, CAD, Scanner, AM

I.   INTRODUCTION

3D printing called as desktop fabrication. It is a rapid prototyping process whereby a real object can be created from a 3D design. A 3D printer machine uses a CAD model for rapid prototyping process. 3D printing is called as desktop fabrication which is a process of prototyping where by a structure is synthesized from its 3d model. The 3d design is stored in as a STL format and after that forwarded to the 3D printer. It can use a wide range of materials such as ABS, PLA, and composites as well.3D printing is one kind of rapidly developing and cost optimized form which is used for rapid prototyping. The 3D printer prints the CAD design layer by layer forming a real object. 3D printing process is derived from inkjet desktop printers in which multiple deposit jets and the printing material, layer by layer derived from the CAD 3D data.3D printing is diversifying and accelerating our life, letting various qualities of products to be synthesized easier and faster. Three-dimensional (3D) printing has the ability to impact the transmission of information in ways similar to the influence of such earlier technologies as photocopying. This identifies sources of information on 3D printing, its technology, required software and applications. Along 3D printing, companies are able to extract and innovate new ideologies and various design replications with no time or tool expense. 3D printing possibly challenges mass production processes in future. 3D printing influences many industries, such as automotive, architecture, education, medical, business and consumer industries.

MOTIVATION FOR THE PRESENT RESEARCH WORK:

Since over a century the visual world of printed scriptures has been dominated by the 2-D printing methods. Be that easy to read or comprehend but when it comes to imaging of definite and real-life models it is sorely outsourced. Any 3-D model cannot be represented and displayed easily in a 2-D workplace. The only thing worth mentioning for likable perception is the rendering of the image. This ushered in the era of the much-needed idea of "3-D" printing.

Basically, the singular purpose for the division of 3-D printer was to prepare 3-D samples directly on the bed of the printer. It has been an effective way of manufacturing since many companies are now opting for this type of method for their production operations.

1.1 OBJECTIVE:

1.   To study different methods of 3d printing and their applications.

2.   To study the working procedure of each component of a 3d printer and the evolution of 3d printer.

3.   To design and fabricate a 3d printer using tool kit.

CFD Analysis of Heat Transfer in A Double Pipe Heat Exchanger Using Fluent

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ABSTRACT: Numerical analysis of 3-d incompressible flow is done for concentric tubular heat exchanger type of domain; this is basically water to water heat exchanger. Analysis is done for both parallel flow and counter flow with different mass flow rate and when we compare the efficiency, efficiency is higher for counter flow and less for the parallel flow because in counter flow we have highest heat transfer area than in parallel flow. Calculation are done for the cross cheq. Ansys Fluent is used for the analysis of double pipe heat exchanger or analysis software. Ansys design modler is used as input CAD package to the FLUENT. Pressure correction technique is used for solving governing equation. Flow is basically simulated at higher Reynolds no., because when we increases the turbulence, efficiency of heat exchanger is also increases, analysis is done in ansys workbench 12.1 and various contour plots and vector plots are presented.

Key words: CFD, HE, CAD, Ansys, Parallel flow, counter flow

I. INTRODUCTION

Heat exchange between flowing fluids is one of the most important physical process of concern, and a variety of heat exchangers are used in different type of installations, as in process industries, power plants, food processing, refrigeration, etc. The purpose of constructing a heat exchanger is to get an efficient method of heat transfer from one fluid to another, by direct contact or by indirect contact. The heat transfer occurs by three principles: conduction, convection and radiation. In a heat exchanger the heat transfer through radiation is not taken into account as it is negligible in comparison to conduction and convection. Conduction takes place when the heat from the high temperature fluid flows through the surrounding solid wall. The conductive heat transfer can be maximized by selecting a minimum thickness of wall of a highly conductive material. But convection is playing the major role in the performance of a heat exchanger.

Forced convection in a heat exchanger transfers the heat from one moving stream to another stream through the wall of the pipe. The cooler fluid removes heat from the hotter fluid as it flows along or across it. Different co relation are used for the calculation of Nusselt no. and heat transfer coefficient.

Heat pipes are used widespread in broad applications since their operation is generally passive in essence. High heat transfer rates are doable by heat pipes over long distances, with minimal temperature difference, exceptional flexibility, simple fabrication, and easy control, not to mention, all without any external pumping power applied.

Possible applications are varied from aerospace engineering to energy conversion devices, and from electronics cooling to biomedical engineering. Heat pipe development is motivated to overcome the need to presumably manage thermal dissipation in progressively compressed and higher-density microelectronic components, while preserving the components temperatures to specification.

A heat pipe operates within a two-phase flow regime as an evaporation–condensation device for transferring heat in which the latent heat of vaporization is exploited to transport heat over long distances with a corresponding small temperature difference. Heat added to the evaporator is transferred to the working fluid by conduction and causes vaporization of the working fluid at the surface of the capillary structure. Vaporization causes the local vapor pressure in the evaporator to increase and vapor to flow toward the condenser, thereby transporting the latent heat of vaporization. Since energy is extracted at the condenser, the vapor transported through the vapor space is condensed at the surface of the capillary structure, releasing the latent heat. Closed circulation of the working fluid is maintained by capillary action and/or bulk forces. An advantage of a heat pipe over other conventional methods to transfer heat such as a finned heat sink is that a heat pipe can have an extremely high thermal conductance in steady-state operation. Hence, a heat pipe can transfer a high amount of heat over a relatively long length with a comparatively small temperature differential. Heat pipe with liquid-metal working fluids can have a thermal conductance of a thousand or even tens of thousands folds better than the best solid metallic conductors, silver or copper. In a heat

Design and Topology Optimisation of Truck Chasis for Maximum Stiffness to Reduce the Weight Using Altair

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ABSTRACT - Automotive chassis is an important part of an automobile. The chassis serves as a frame work for supporting the body and different parts of the automobile. Also, it should be rigid enough to withstand the shock, twist, vibration and other stresses. Along with strength, an important consideration in chassis design is to have adequate bending stiffness for better handling characteristics. So, maximum stress, maximum equilateral stress and deflection are important criteria for the design of the chassis. This report is the work performed towards the optimization of the automotive chassis with constraints of maximum shear stress, equivalent stress and deflection of chassis. Structural systems like the chassis can be easily analysed using the finite element techniques. The mass optimization of chassis is performed to reduce the weight of the chassis for maximum stiffness condition by using Altair inspire software.

Key words: Optimization, Topology, Chasis Stress, INSPIRE

I. INTRODUCTION

The chassis which is made of pressed steel members can be considered structurally as grillages. It acts as a skeleton on which, the engine, wheels, axle assemblies, brakes etc. are mounted. Every vehicle body consists of two parts; chassis and body work or superstructure. The chassis is the frame work of any vehicle. Its principle function is to safely carry the maximum load for all designed operating conditions. It must also absorb engine and drive line torque, endure shock loading and accommodate twisting on un even road surfaces. The chassis receives the reaction forces of the wheels during acceleration and breaking and also absorbs aero dynamic wind forces and road shocks through the suspension. So the chassis should be engineered and built to maximize pay load capability and to provide versatility, durability as well as adequate performance. To achieve a satisfactory performance, the construction of a heavy vehicle chassis is the result of careful design and rigorous testing. It should be noted that this 'ladder' type of frame construction is designed to offer good downward support for the body and pay load and at the same time provide torsion flexibility, mainly in the region between the gearbox cross member and the cross member ahead of the rear suspension. This chassis flexing is necessary because a rigid frame is more likely to fail than a flexible one that can 'weave' when the vehicle is exposed to arduous conditions. A torsionally flexible frame also has the advantage of decreasing the suspension loading when the vehicle is on uneven surfaces , assemblies, brakes, suspensions etc are mounted. The frame supports the cab, engine transmission, axles and various other components. Cross members are

also used for vehicle component mounting and protecting the wires and tubing that are routed from one side of the vehicle to the other. The cross members control axial rotation and longitudinal motion of the main frame, and reduce torsion stress transmitted from one rail to the other.

Layout of chassis and its main components:
• Frame: it is made up of long two members called side members riveted together with the help of number of cross members.
• Engine or Power plant: It provides the source of power
• Clutch: It connects and disconnects the power from the engine fly wheel to the transmission system.
• Gear Box
• U Joint
• Propeller Shaft
• Differential
1.1.1 Functions of the Chassis Frame
• To carry load of the passengers or goods carried in the body.
• To support the load of the body, engine, gear box etc.
• To withstand the forces caused due to the sudden braking or acceleration.
• To withstand the stresses caused due to the bad road condition.
• To withstand centrifugal force while cornering

1.1.2 Types of chassis frames
• Conventional frame
• Integral frame
• Semi-integral frame

CFD Analysis of a Finned Vertical Tube with Different Cross Sections to Improve the Heat Transfer Rate

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ABSTRACT: The heat transfer rate to a fluid flowing in pipe can be enhanced by the use of internal fins. This work concerned with simulation analysis of vertical tube with helical fins used to enhance their heat transfer performance subjected to natural convection heat transfer. All the main parameters which can significantly influence the heat transfer performance of finned tube has been analyzed. Natural convection in a vertical tube without fins was taken as the reference tube and different fin patterns such as a single fin with large no. of turns like coiled shape and large no. of fins with single turn is compared with reference tube on the basis of different parameters such as heat transfer rate, surface Nusselt number, heat transfer coefficient, fin effectiveness etc. There are some dimensionless numbers which affect the natural convection such as nusselt number which is the function of Reynolds number, grashof number and prandtl number, Rayleigh number which is the product of grashoff and Prandtl number. After getting best fin configuration compared it with different fin profile such as rectangular cross section, tapered fin with trapezoidal cross section and hyperbolic cross section. All the computer simulation analysis has been done on the ANSYS. The Navier-stokes equations were used to solve for the fluid flow inside the tube and the Boussinesq approximation was used to get the buoyancy effect. Aluminum is used for the fin material and air is taken as the fluid flowing inside the tube and the flow is taken as laminar. It was found that the large number of fins with single turn is more efficient than other fin patterns, as there is less flow resistance, high heat transfer rate.

Key words: CFD, FVT, HTR, ANSYS, Nusselt, Grashoff, Prandtl

I. INTRODUCTION

Convection is a process which involves mass movement of fluids. Natural convection occurs due to temperature difference which produces the density difference which results in mass movement, this process is called natural or free convection. For example, assume a plate which is maintained isothermal at temperature T_w and the surrounding temperature is T_∞. On getting heated, the fluid near the wall moves up due to the effect of buoyancy and this hot fluid is replaced by cold fluid moving towards the wall. Hence a circular current is set up due to density difference. There is a boundary layer adjacent to the plate where the velocity and temperature and velocity vary from plate to free stream. Initially the velocity increase with increasing distance from the surface and reaches a maximum and then decrease to approach zero value. This is because of action of viscosity diminishes rapidly with distance from plate, while density difference decreases more slowly.

The used of heat transfer enhancement has become widespread during the last so many years. The need of heat transfer enhancement is to reduce the size and cost of heat exchanger equipment, or increase the heat duty for a give size heat exchanger. This goal can be done in two ways active and passive enhancement. The active enhancement is less common because it requires addition of external power (e.g., an electromagnetic field) to cause a desired flow modification. In the passive enhancement, it consists of alteration to the heat transfer surface or incorporation of a device whose presence results in a flow field modification. The most popular enhancement is the fin.

Fins are the extended surfaces which are used to enhance the rate of heat transfer dissipation from heated surfaces to air. Fins can be placed on plane surfaces, tubes, or other geometries. These surfaces have been used to increase heat transfer rate by adding additional surface area and encouraging mixing. When number of fins are used to enhance heat transfer under natural convection conditions the optimum geometry of fins (corresponding to a maximum rate of heat transfer) should be used, provided this is compatible with available space and financial limitations. The common fins used extensively to increase the rates of natural convection heat transfer from systems are rectangular fins because such fins are simple and cheap,

Thermal Analysis of Solar Air Heater Using CFD as A Tool

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ABSTRACT: Solar air heating is a solar thermal technology in which the energy from the sun is captured by an absorbing medium and used to heat air. Solar air heater including a housing having a transparent front wall and an inlet and outlet for establishing a flow path for a gas such as air to be heated. An attempt has been made to carry out CFD based analysis using FLUENT to fluid flow and heat transfer characteristics of solar air heater. 3D model of the Solar Air heater involving air inlet, absorber plate, glass, modeled by ANSYS Workbench and the unstructured grid was created in ANSYS. The results were obtained by using ANSYS FLUENT software. This work is done by using computational fluid dynamics (CFD) tool with respect to flow and temperature distribution inside the solar air heater.

Key words: CFD, Ansys, AH, Tool, Solar air heating

I. INTRODUCTION

Solar air heating is a solar thermal technology in which the energy from the sun, insolation, is captured by an absorbing medium and used to heat air. Solar air heating is a renewable energy heating technology used to heat or condition air for buildings or process heat applications. It is typically the most cost-effective out of all the solar technologies, especially in commercial and industrial applications, and it addresses the largest usage of building energy in heating climates, which is space heating and industrial process heating.

HISTORY OF AIR HEATING:

For the first 100 years home heating was dominated by biomass (wood) and it was not until 1885 that the nation would burn more coal than wood. Prior to 1885 the majority of homes were heated with wood burning brick fireplaces and derivatives of the cast iron Franklin stove invented in 1742.

By the end of the 19th century the invention of low-cost cast-iron radiators would bring central heating to homes with a coal fired boiler in the basement delivering hot water or steam to radiators in every room. At about the same time, in 1885, Dave Lennox built and marketing the industry's first riveted-steel coal furnace. Without electricity and fans to move air, these early furnaces transported heat by natural convection (warm heated air rising) through ducts from the basement furnace to the rooms above. These two methods would dominate home central heating until 1935, when the introduction of the first forced air furnace using coal as a heat source used the power of an electric fan to distribute the heated air through ductwork within the home.

Shortly thereafter, gas and oil-fired versions of forced air furnaces would relieve the homeowners from the chore of "stoking the coal fire" and relegate coal furnaces and cast-iron radiators to the dust bin of history. Fast forward to today and about 60% of our homes be heated with gas fired forced air furnaces (FAU's) and another 9% with oil fired FAU's. In warmer climates, a quarter of our homes would be heated by FAU's using electric "heat pumps" to supply heating energy.

MODERN BEGINNINGS:

Chimneys and Stoves: -

The next important advance in heating was the invention of the chimney. The origins of the chimney flue probably lie with the Normans, who used sidewall flue openings in place of the previously used central roof vents. Many sidewall flues were constructed at an oblique angle upward, thus beginning a transition to vertical chimney construction.

After the 14th century, chimneys appear in written literature. However, their use seems to have spread very slowly. Chimneys were still rare enough 200 years later that one Early chimneys were very large, so as to allow a chimney sweep to climb into them. But the size precipitated such vicious drafts that room divider screens sometimes had to be used to shield the occupants.

Stove heating soon advanced beyond the crude devices first used. The first freestanding warm-air stove was probably the "Furnus Acapnos" or "smokeless stove" invented by Dalesme in France in the late 1600s. Dalesme introduced fresh fuel in the same opening as combustion air, directing

Design and Analysis of Three Plate Injection Mould

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ABSRACT: The objective of this paper is to design a three-plate injection mould that used to produce the differential cover components which are used in automobile. In the proposed work we are trying to design injection mould that has the capacity to produce thin walled plastic components without warpage defect and also a mould which permits the part to be created in new plane away from gating system to allow sufficient cooling time for the component before ejection. The aim is to create a mould which has flexibility to place gating system anywhere on the mould design. The design of three plate injection mould has done using inspire design software and the analysis software. For manufacturing and study the mechanical behavior of the three-plate injection mould has been carried out for four materials. Out of four materials AISI 304 gives us the better results.

Key words: Injection mould, Automobile, Ansys, AISI 304, materials

I.   INTRODUCTION

Injection molding is the most commonly used manufacturing process for the fabrication of plastic parts. A wide variety of products are manufactured using injection molding, which vary greatly in their size, complexity, and application. The injection molding process requires the use of an injection molding machine, raw plastic material, and a mold. The plastic is melted in the injection molding machine and then injected into the mold, where it cools and solidifies into the final part. The steps in this process are described in greater detail in the next section

Injection molding is used to produce thin-walled plastic parts for a wide variety of applications, one of the most common being plastic housings. Plastic housing is a thin-walled enclosure, often requiring many ribs and bosses on the interior. These housings are used in a variety of products including household appliances, consumer electronics, power tools, and as automotive dashboards. Other common thin-walled products include different types of open containers, such as buckets. Injection molding is also used to produce several everyday items such as tooth brushes or small plastic toys. Many medical devices, including valves and syringes, are manufactured using injection molding as well.

II.   EJECTION

 Mould tool ejection systems vary enormously both in complexity and design. The prime function of any ejector system must be that of clearing the moulded components away from the mould on opening, thus enabling the press to recycle. Once clear of the mould the components free fall under gravity away from the moulding area or are removed by other means, e.g. by robot. Usually situated in the core half of the mould, the ejection system can be actuated by the moulding machine or the opening action of the mould. A few of the most commonly encountered ejection components arc listed and described below.

(a) Ejector ban: The ejector bar mechanically interfaces the mould ejection system with that of the moulding machine. The bar can either be linked to the mould (e.g. by a screw thread) or used as a knocker bur without any mechanical linkage between mould or machine.

(b) Ejector plates: The ejector bar transmits the ejection force as a single point load to the centre of the ejector plates. The applied load is distributed to the various components attached or contained within the plate assembly. Ejector plates must be of rigid construction in order to withstand the relatively high cyclic loads imposed on them during service. If the plates flex or bow under load tool wear may occur which could significantly shorten the mould's service life.

(c) Support pillars and parallel blocks: These components transmit the clamping force from the mould back plate through and about the ejector plate recess directly to the core plate. The support pillars additionally act as guides to locate the ejector plate assembly. The amount of ejection stroke available is determined primarily by the overall height of these two components.

(d) Ejector pins and blades: These headed components are trapped between the ejector plates. The ejector pins and blades are usually positioned within the core assembly, seated in reamed holes and ground flush to the face of the

Modelling and Mass Optimization of CNC Machine   Arbor for Maximum Cutting Force by Using Altair Inspire

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ABSTRACT: Traditionally, the design field has been identified with particular end products, e.g., mechanical design, electrical design, ship design. In these fields, design work is largely based on specific techniques to foster certain product characteristics and principles. The scope of this work includes, to design, model and simulate the CNC arbor, to optimize the cutting tool arbor for maximum stiffness condition and also to detailed factor safety in design . When new software and manufacturing processes are introduced, traditional empirical knowledge is unavailable and considerable effort is required to find starting design concepts. Milling operation is today the most effective and productive manufacturing method for roughing and finishing large surfaces of metallic parts. The model simulates precisely the mass optimization of cutting tool and structural analysis to study the optimized model is to make sure that the arbor in safe condition. The accuracy of the simulation model has been thoroughly verified, with the aid of a wide variety of experiments. The analysis of mass optimization and structural analysis is performed in the Altair inspire software.

Key words: Optimization, CNC, Cutting force, Design, Arbor

I. INTRODUCTION

Today, Computer Numerical Control is an extension of what was once Numerical Control. It refers essentially to the concept of controlling automated machine tools via programmable computers. Clearly, with the older system of Numerical Control, a computer wasn't involved, but today the technology has advanced in leaps and bounds (and continues to advance every year). CNC has set the stage for a tremendous upsurge in productivity – it's an environment where machine tools can operate automatically, and without the attention and oversight of an operator.

Historically, the first commercial Numerical Control machines were used in the early 1950's, and operated with "punch tape". And although a proven method, the so-called "new" technology was not readily accepted by manufacturers. In the late 1950's, Numerical Control began to capture the interest of more and more manufacturers, but still with some problems and issues that required attention. Things became more manageable when industry groups standardized the operational aspects of NC, bringing some order and commonality to the manufacturing sector.

Over the years, as CNC technology gained acceptance (with proven results), manufacturers began to replace older technologies and manual machining methods with Computer Numerical Control. And while the United States launched the CNC technology revolution, Germany and

Japan became more successful in enhancing the technologies and bringing down unit costs. In more recent years, microprocessors have brought down unit costs even more, and have made CNC technology much more accessible to smaller manufacturing companies, as well as individuals. Whether it's metal cutting machines, or woodworking machines, the technology is being used universally, and with advanced applications emerging every year. As for the CNC machinist, CAD programs, CAM programs, and other computer software are the basis for designing and fabricating almost every product that consumers use on a daily basis. Indeed, like the 1950's and 1960's, advances and innovations in technology will continue to revolutionize throughout the 2000's.

The term "CNC" is a generic term which can be used to describe many types of device, this would include plotters, vinyl cutters, 3D printers, milling machines and others. CNC stands for Computer Numerically Controlled and basically means that the physical movements of the machine are controlled by instructions, such as co-ordinate positions that are generated using acomputer.The term "CNC Machine" is typically used to refer to a device which uses a rotating cutting tool which moves in 3 or more axes (X, Y and Z) to cut-out or carve parts in different types of materials. The information on these pages will focus on what are typically referred to as "CNC Routers" although it would be applicable to most CNC milling and engraving

CFD Analysis of Whale Inspired Hydrofoil with Different Angles of Attack

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ABSTRACT - Recent discoveries in the biomimicry field found that mimicking Humpback whale flippers can give us better Drag and Lift coefficients. CFD analysis is done on whale inspired modified NACA-0021 foil with sinusoidal leading edge. And Velocity and pressure contours are generated to see the results.It has found that with the change in the angle of attack of each foil the velocity contour changes. The geometry was managed using the Design Modeler tool. The fluid flow simulation was carried out using ANSYS Fluent. The result showed the performance of E387 is better than other hydrofoils as it gives better lift force with the least drag force, resulting in better hydrodynamics of turbine blade. Overall, the value of lift and drag coefficients at 10 o was more consistent than 0 o and 20 o AOA.

Key words: CFD, Hydrofoil, Angles, AOA, Ansys, E387

I. INTRODUCTION

It is a fact of common experience that a body in motion through a fluid experience

a resultant force which, in most cases is mainly a resistance to the motion. A class of body exists, However for which the component of the resultant force normal to the direction to the motion is many time greater than the component resisting the motion, and the possibility of the movement of fast ships above water depends on the use of the body of this class for wing structure. Hydrofoil is such an aerodynamic shape that when it moves through water, the water is split and passes above and below the wing. The wing's upper surface is shaped so the water rushing over the top speeds up and stretches out. This decreases the water pressure above the wing. The water flowing below the wing moves in a comparatively straighter line, so its speed and water pressure remain the same. Since high water pressure always moves toward low water pressure, the water below the wing pushes upward toward the water above the wing. The wing is in the middle, and the whole wing is "lifted." The faster an fast boat moves, the more lift there is. And when the force of lift is greater than the force of gravity, the fast boat is able to lift above water. AOA is the angle between the oncoming water or relative wind and a reference line on the fast boat or wing. Sometimes the reference line is a line connecting the leading edge and trailing edge at some average point on a wing. So in this report I have basically took an hydrofoil NACA 0021 and with various angle of attacks and keeping velocity constant I concluded a result on maximum lift and drag coefficient. Surfing is a global sport that involves catching and riding

waves on a surfboard fitted with fins. Currently, only one other study compares field performance and numerical (computational fluid dynamics, CFD) results of different surfboard fin designs [1]. The study involved a single, longboard-style surfing fin, comparing a standard longboard fin to a tubercled, "real whale" (RW) design. Static CFD results showing improved efficiency and an expanded operating envelope for RW led to field testing of a prototype RW design. Results from over 650 surfed waves, comparing RW to a standard longboard fin confirmed the CFD results, with significant improvements in max speed, average speed, and distance surfed on individual waves. Rather than single longboard fins, the present study compares field and numerical results from 3-fin thruster sets. Introduced by Simon Anderson in 1980 [2], thruster sets are commonly used in high performance shortboard surfing, where maneuverability and control are key performance factors. Specifically, this paper focuses on the cutback, or top turn (Figure S1), an important maneuver during recreational and competitive surfing [3–5]. To gain more understanding of field performance of RW vs. control fins attached to shortboards, this study uses dynamic CFD to simulate field results and compare forces imparted to 3-fin thruster sets.

1 .1 OBJECTIVE

1. To check the behavior of CL (coefficient of Lift), CD (coefficient of Drag) in
2. NACA- 0012 (National Advisory Committee for Aeronautics) When the velocity is kept constant. When the AOA(Angle Of Attack) is varied from -25° to 25° with a gap of 5 degrees.

Optimization of Support Structures to Avoid the Lift Off of Printing Component for Renishaw Am 240 Machines

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ABSTRACT: Additive manufacturing is rapidly growing technology in the field of production and research. AM is perceived as an environmentally friendly and sustainable technology and has already gained a lot of attention globally. The potential freedom of design offered by AM is, however, often limited when printing complex geometries due to an inability to support the stresses inherent within the manufacturing process. Additional support structures are often needed, which leads to material, time and energy waste. Research in support structures is, therefore, of great importance for the future and further improvement of additive manufacturing. This paper aims to review the varied research that has been performed in the area of support structures. To study the effect of support structures we have taken three different types of support structures to optimize the best support structure. Optimizing the perfect support support structure will give better results on the final build component. Support structure will help in improving the better mechanical properties also. The dimensional accuracy and surface roughness are also depending on the support structure geometry.

Key words: Optimization, AM240, simulation, circular support structures, Temparature

I. INTRODUCTION

Selective Laser Melting (SLM) is a metal additive manufacturing (AM) process wherein a laser beam is used to melt and fuse metal powder layer by layer to create a part. This technology is considered to be one of the upcoming techniques to manufacture near net shape components for industries like automobile, aerospace, defence and biomedical. Further, due to layer-by-layer building approach, this process enables to fabricate components with complex shapes using volume optimization techniques like topology optimization (TO). Brackett et al. (2011) reviewed the feasibility of implementation of topology optimization to additive manufacturing techniques. They reported that TO designs can be effectively employed to manufacture products using AM with a significant improvement in TO methods. Furthermore, Brandt et al. (2013) employed the SLM technique to fabricate an optimized design of an aerospace bracket. They described various strategies to improve the manufacturability of the 2 optimized designs using the SLM process. However, to realize the full potential of TO, the AM processes have to be fully optimised, as reported in detail by Zegard and Paulino (2016).

Till date, most of the studies have been carried out to assess the feasibility of SLMprintability of a variety of engineering materials. Yap et al. (2015) reviewed different materials that were being employed in the SLM process along with their applications. They reported that most engineering materials like aluminium, steels, cobalt- and nickel-based superalloys, and titanium alloys are being studied for printability using SLM. However, to fabricate functional parts using SLM process, considerable research is required to obtain fully dense metal components by selection of optimum process parameters. For example, Yasa and Kruth (2011) printed single layers of 316L stainless steel to study the effect of SLM process parameters on density and microstructure. They reported that even though SLM process is capable of producing parts with densities of 98-99%, the remaining porosity of even 1-2% would render the as-built SLM parts not suitable for high strength and load bearing applications in aerospace and defence industries. Therefore, it is vital that a comprehensive understanding of the SLM process is developed to achieve desired properties. SLM is a complex additive manufacturing process that involves understanding the interaction between various parameters relating to materials, machine, as well as fabrication aspects. Irrinki et al. (2016) found that the powder parameters like particle size and shape along with powder atomization process affect the density and mechanical properties of SLM printed parts. Moreover, Attar et al. (2015) studied the influence of particle morphology on the density of in-situ Ti-TiB composite material parts fabricated via SLM. The relative density of the samples produced using spherical particles was 99.5% when compared to samples printed

Design and Analysis of Screw Operated Gripper and RPT Estimation

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ABSTRACT: The objective of the paper is to build a three fingered gripper for a flexible robotic arm to have the capability of mimic the motion of a snake such that work space of the robotic arm is maximized. In this paper a three fingered gripper is designed with payload capacity of 2kg by considering flexible design, ease of manufacture, low cost and recyclable material as the constraints. The designing of three fingered gripper is done in AUTODESK FUSION360. Based on the design, it is identified that the screw operated gripper has more flexibility and better efficiency when compared with other designs hence the performance of screw operated gripper is analysed using Ansys software. From the analysis, based on the deformation and stress values, it is ensured that designed screw operated gripper made of ABS (Acrylonitrile butadiene styrene) material is capable of handling 2kg of load. The printing time and cost estimation is carried out by slicing of screw operated gripper by using Ultimaker Cura software.

Key words: RPT, CURA, FUSION360, ABS, FRA

I.   INTRODUCTION

Grippers are special devices designed to help robots handle objects in the real world. Grippers are also known as 'end-effectors' or 'manipulators'. Some grippers look just like hands, while others look like a hand with two or three fingers. Some grippers don't look like hands at all; they look more like robot claws. Other grippers come with giant suction cups. Some grippers look like a soft round ball. Some have magnetized tips. And grippers receive their power in different ways, from electrical to pneumatic (air) and hydraulic (hydraulic fluid).

Payload refers to the entire weight the robot arm is able to support, including the gripper. Just as your arm and hand can only lift certain weights at the gym, a robot can only handle so much weight without faltering. So, when choosing your robot hand, you must consider the payload capabilities of the robotic arm and the gripper itself.

Robotics is a mixture of geometric transformations, control theory, stepper / DC motors, digital signal processing and a real-time operating system. Robot is a reprogrammable and multifunctional manipulator designed to move materials / pieces from one place to another through different movements programmed to perform a series of tasks and the robot can also be classified according to its application method as a way of control, operating parameters, environmental conditions, structural design, structure materials, technology level. The two main types of control are servant and non-servant. The volume of the work space of a robot can be articulated in a rectangular, cylindrical, spherical or spherical shape. The growing competition of

industrial robots for tasks normally performed by human hands has led to the need for more efficient handling equipment, in particular pre-tensioning instruments (more commonly called clamps). This is one of the reasons why tweezers deserve special attention. However, industrial robots are not simply a substitute for people often in applications beyond the normal (physical or temporary) capacity of conventional labour.

II.   LITERATURE SURVEY

A. Krishnaraju et al [1] designed a three fingered robot mechanism which has the potential to fulfil various demand in industry and factories. So far there are so many mechanisms available for robot gripper in three fingered robot gripper mechanism is a type of mechanism which is used in industrial robots for moving object, which has higher gripper ratio. The kinematic system has been designed for one degree of freedom and the kinematic design of robot structure is developed using SAM mechanism software. The gripper modelling has been designed using Pro-E Wildfire5.0 software and a three finger gripper is fabricated by aluminium material for 5 kg payload. The gripper mechanism has three fingers which are used to hold the object in a balanced way to meet the challenges faced on the industrial life. The fingers are also provided with senses to identify the type of object.

S. Chandra Sekhar et al [2] published a paper. In this paper, the design of an open source, low cost, single actuator under actuated gripper that can be created through fast and commonly accessible through rapid prototyping techniques and simple off the shelf components. This work establishes

Design, Modelling and Analysis of Front Wheel Assembly of Baja SAE Vehicle

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ABSTRACT: The purpose of the Society of Automotive Engineers (SAE) Baja Major Qualifying Project (MQP) was to analyze the pre-existing Baja SAE (BSAE) vehicles to determine flaws and design a new chassis that improved upon the previous designs. This MQP identified particular problems with the size of the engine compartment, the overall suspension alignment and attachment points, as well as the visibly crooked nature of the vehicle. After consideration of possible solutions, the MQP created various preliminary designs utilizing the Baja SAE Rules as a guide for design decisions. In this study we have perform the numerical solutions for different subsystems of Baja SAE vehicle to design the front wheel assembly. The modelling of front wheel done in auto desk fusion 360 software and assembly operations performed.

Key words: Design, Modelling, Fusion 360, SAE, MQP

I.   INTRODUCTION

The purpose of this paper is to optimize the design of front wheel assembly of ATV for the better performance of the vehicle by reducing the weight of the components of front wheel assembly and also by changing the material properties of components of front wheel assembly. Therefore, the design should meet the following criteria, Lightweight to maintain good performance to weight ratio of the ATV. Optimum stiffness to ensure low system compliance and maintaining designed geometries. Ease of maintenance for enhancing serviceability and setup repeatability. As the name suggest, Front Wheel assembly consists of various component, as shown in figure 1, that are Assemble together to get a single complete unit. The complete wheel assembly is attached to the rim of the wheel, with the four mounting points on the one side and from the knuckle side; it is attached to the suspension control arms and the tie rod including both, with the three points. The front wheel assembly is used to allow the vehicle to move. Front wheel assembly connects the steering arm, which allows the driver to steer the vehicle, and the caliper is the component, which allows the driver to stop the vehicle with the help of Brake pads which mounts on the rotating disc.

The major problem of this assembly is that its weight includes in the unsprung weight of the vehicle which is totally undesirable. The unsprung mass of the vehicle has an impact on the various performance parameters of the vehicle while it is moving in dynamic conditions like problems in acceleration, braking, steering effort etc.

The objective of the research work is to design the front wheel assembly for ATV vehicle and further optimizing it by reducing its weight. The sub objective of the paper includes:

1. Study of static and dynamic parameters of the wheel assembly.
2. Study of suspension, steering, braking systems and parameters affecting its performance.
3. Workout the parameters by analysis, design, and optimization of the system.

II.   METHODOLOGY

The design and optimization of the front wheel assembly has a very wide scope. The designers modify and optimize the front wheel assembly especially the hub and knuckle in order to reduce the unsprung weight of the vehicle which in turn improves the overall performance of the vehicle. This is very vastly seen in the student integrated competitions at college level. The front wheel assembly is excessively integrated in the automotive industry as well. This results in overall weight reduction of vehicle, fuel efficiency which is an important matter of concern these days.

In this report, firstly calculations are done on steering, braking, and suspension subsystems. For the design of steering and suspension system this report uses special type of ICR (instantaneous center of rotation) diagram and for calculating various parameters related to the front wheel assembly a extensive survey is done. For obtaining the vehicle behavior in various conditions special software is used called as LOTUS. The formulae derived are validated using design books and research papers. The points required to design the front wheel assembly were obtained.

Design and Analysis of Aircraft Engine Cooling Fan

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ABSTRACT - The current work is aimed to design an aircraft engine cooling fan. the family of turbo machines and they move air or gas conns belong continuously at desired velocity by action of a rotor. Flow investigation of the fan is planned to be carried out by using ANSYS-FLUENT software for different designed off design points of operation. The performance of the fan generated from the CFD analysis at the design point will be compared with that of the designed data assumed for calculation. This will also be compared with the best efficiency point of operation. For the analysis, an CAD drawing, and a 3-D model of the fan impeller and casing are developed for the designed fan. This is followed by the generation of Grid and aerodynamic analysis using the available CFD solver. The work is concluded by identifying possible zones of improvements in the design of impeller and casing and suggests suitable modifications.

Key words: Design, Aircraft, CFD, Ansys, Grid, Aerodynamic

I.   INTRODUCTION TO TURBO MACHINES

Turbomachines used for the compression of gases are classified under radial, axial, or mixed flow types depending on the flow through the impeller. In a radial or centrifugal machine, the pressure increase due to the centrifugal action forms an important factor in its operation. The energy is transferred by dynamic means from the impeller to the fluid. The fluid because of centrifugal action is continuously thrown outwards making way for fresh fluid to be inducted in because of the reduced local pressure. Another characteristic feature of the centrifugal impeller is the angular momentum of the fluid flowing through the impeller is increased by virtue of the impeller outer diameter being significantly larger than the inlet diameter. In axial flow machines, a large mass of gas is set in motion by the rotating impeller and is made to move forward because of the aerodynamic action of the blades. A mixed flow machine encompasses the properties of both the above types. Depending on the pressure rise attained, these machines are named as fans and blower or compressors. There is however no distinct demarcation among the different types. Fans handle gases in large volumes without appreciable density variation. Pressure ratio attainable is of the order of 1.05. They are invariably single stage machines. Blowers cover pressure ratios from 1.05 to about 4. They are made either as single stage or two or three stages. No inter cooling is required. Compressors include pressure ratios from 3 to 12 or higher. They are invariably multistage with or without intercooling. For higher pressure ratios appreciable compression takes place followed by a reduction in volume. The calculations are done on the basis of mass flow in such cases. The selection of a type of impeller namely axial, radial, or mixed flow for a specified pressure rise, speed and flow rate follow from shape number considerations defined by

$$N_{shape} = n \, \sqrt{(v)} / \, w^{0.75}$$

The shape number is important to achieve an optimum efficiency. Radial machines have low shape numbers ranging from 0.033 to 0.12 and are known as slow running impellers. Axial flow types have shape numbers from 0.33 to 1.5. Mixed flow types have values in between those of radial and axial impellers. An idea of the shape of impeller can be obtained from the shape number. For example, slow running impellers have long and narrow vane channel passages and large shroud diameters. This increases the friction losses and lowers the efficiency high shape numbers are desirable. The energy which is converted into pressure in the impeller is indicated by the degree of reaction which is the ratio of specific pressure energy to the specific work of the machine. Blowers and compressors operate with degree of reaction greater than zero, and mostly than 0.5. The reason is that the static pressure can be generated more efficiently in the impeller than in the guide vanes as the centrifugal forces in the rotating channels of the impeller help in the suction of the boundary layer and dead zones. If the specified pressure rise cannot be obtained in one stage, two or more stages as required are built in series, the individual stages being joined by what are known as return guide passages or return channels. In such a multistage centrifugal compressor or blower, the chief problems encountered are regarding the design of efficient guide and return channel passages as well as carefully designed shroud and vane contours. Though compressors with more than eight or ten stages are in existence, the number of stages is generally restricted to two or three. The desired pressure rise is obtained by

Thermal Analysis of Engine Cylinder Fins to Optimize the Shape to Improve the Heat Transfer Rate

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ABSTRACT: The Engine cylinder is one of the major automobile components, which is subjected to high temperature variations and thermal stresses. In order to cool the cylinder, fins are provided on the surface of the cylinder to increase the rate of heat transfer. By doing thermal analysis on the engine cylinder fins, it is helpful to know the heat dissipation inside the cylinder. We know that, by increasing the surface area we can increase the heat dissipation rate, so designing such a large complex engine is very difficult. The main aim is to analyze the thermal properties by varying the geometry of fins. The accurate thermal simulation could permit critical design parameters to be identified for improved life. Presently Material used for manufacturing cylinder fin body is Aluminum Alloy AA 6061 which has thermal conductivity of 160 – 170 W/mk. presently analysis is carried out for cylinder fins using this material.

Key words: FINs, HTR, AA6061, Simulation, material

I.   INTRODUCTION

Internal combustion engine cooling uses either air or a liquid to remove the waste heat from an internal combustion engine. For small or special purpose engines, cooling using air from the atmosphere makes for a lightweight and relatively simple system. Watercraft can use water directly from the surrounding environment to cool their engines. For water-cooled engines on aircraft and surface vehicles, waste heat is transferred from a closed loop of water pumped through the engine to the surrounding atmosphere by a radiator. Water has a higher heat capacity than air, and can thus move heat more quickly away from the engine, but a radiator and pumping system add weight, complexity, and cost. Higher-power engines generate more waste heat, but can move more weight, meaning they are generally water-cooled. Radial engines allow air to flow around each cylinder directly, giving them an advantage for air cooling over straight engines, flat engines, and V engines. Rotary engines have a similar configuration, but the cylinders also continually rotate, creating an air flow even when the vehicle is stationary. Aircraft design more strongly favors lower weight and air-cooled designs. Rotary engines were popular on aircraft until the end of World War I, but had serious stability and efficiency problems. Radial engines were popular until the end of World War II, until gas turbine engines largely replaced them. Modern propeller-driven aircraft with internal-combustion engines are still largely air-cooled. Modern cars generally favor power over weight, and typically have water-cooled engines. Modern motorcycles are lighter than cars, and both cooling fluids are common. Heat engines generate mechanical power by extracting energy from heat flows, much as a water wheel extracts mechanical power from a flow of mass falling through a distance. Engines are inefficient, so more heat energy enters the engine than comes out as mechanical power; the difference is waste heat which must be removed. Internal combustion engines remove waste heat through cool intake air, hot exhaust gases, and explicit engine cooling Engines with higher efficiency have more energy leave as mechanical motion and less as waste heat. Some waste heat is essential: it guides heat through the engine, much as a water wheel works only if there is some exit velocity (energy) in the waste water to carry it away and make room for more water. Thus, all heat engines need cooling to operate. Cooling is also needed because high temperatures damage engine materials and lubricants. Cooling becomes more important when the climate becomes very hot. Internal-combustion engines burn fuel hotter than the melting temperature of engine materials, and hot enough to set fire to lubricants. Engine cooling removes energy fast enough to keep temperatures low so the engine can survive Some high-efficiency engines run without explicit cooling and with only incidental heat loss, a design called adiabatic. Such engines can achieve high efficiency but compromise power output, duty cycle, engine weight, durability, and emissions.

1.1 Generalization difficulties

It is difficult to make generalizations about air-cooled and liquid-cooled engines. Air-cooled diesel engines are chosen for reliability even in extreme heat, because air-cooling would be

simpler and more effective at coping with the extremes of temperatures during the depths of winter and height of

Geometry and Location Optimization of Wavy Flag to Improve the Heat Transfer Rate Vortex Generator

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ABSTRACT: This work demonstrates the effect of different shapes and positions of a wavy flag vortex generator on the heat transfer in a rectangular channel using Computational Fluid Dynamics (CFD) analysis. It covers the shape optimization as well as the position optimization of the shape optimized flag to achieve the best heat transfer enhancement. The result of post analysis shows that the shape optimized flag is the combination of rectangular and triangular flag and the optimized position is the flags arranged horizontally along the breadth of the channel. Average Nusselt number in shape optimized flag is 20 % higher than that in no flag condition, whereas in best optimized position in which 3 shape optimized flags are used it is 70 % higher when compared to no flag condition. This work also covers the experimental validation for the result of position optimization. Although, heat transfer enhancement by introducing additional turbulence had been widely studied but usage of flag, effect of different shapes of flag and the flag positions for improving the heat transfer has not been explored much in practical applications. This paper thus presents the use of flag for heat transfer enhancement.

Key words: Geometry, Optimization, HT, Vortex, Enhancement.

I.   INTRODUCTION

All the industrial systems dealing with heat and fluid transfer involve fluid flow through channels and must deal with efficient heat dissipation problem at the same time. Heat transfer through channels is one of the classical problems in the heat transfer and fluid mechanics. The thermal behaviour of these channels has been described well by the correlations given by Dittus and Boelter [1]. These correlations imply that the Nusselt number of the fluid flowing inside the channel is a function of Reynolds and Prandtl number which represent the flow properties of fluid. Nusselt number is used to find the average heat transfer coefficient which gives the idea of amount of the heat carried by the air. Nusselt number can be easily varied by changing the Reynolds or the Prandtl number. As it is difficult to vary flow properties (i.e. change the Prandtl number), usually the Nusselt number is controlled by varying the Reynolds number. Vortex generators can be used as one of the methods to vary the Reynolds number in a channel. Vortex generator (VG) is aerodynamic device, consisting of a small vane like structure usually attached to a lifting surface. These are most often used to delay the local flow separation and aerodynamic stalling, in applications such as wings and control surfaces, flaps, elevators, aileronsand rubber. Various heat transfer enhancement techniques are used for enhancing the heat transfer in the channel. All these techniques come under active and passive techniques. They are used to enhance heat transfer by generating the vortex (whirl) in the flow. Passive techniques involve creating protrusions, dimples, corrugations etc. The flow can take place only in one direction as passive devices will be in-affective in case the flow direction changes. Active techniques involve external source like fans in which direction of flow can be altered, but the active techniques require an external source of energy which is a drawback. Another disadvantage is the size, as the fans cannot be introduced in small channels. The passive method has been more widely accepted than the active methods as they do not require any external power to produce whirl in the flow. Like these passive techniques, vortex generators can be used in the form of flags. Flag is a better solution to both active and passive techniques as they do not require the external source of energy and change in the direction of the flow doesn't affect its performance as it can change the direction of its fluttering with the change of course of flow. When the fluid flows over the flag, due to the fluttering of flag a whirl is produced which results in the mixing of the fluid. This mixing affects the thermal boundary layer and the temperature field which in turn increases the heat transfer. Software and numerical based analysis have been carried out to study the vortex generator's effect on the heat transfer. Ralph Kristoffer and Rajneesh N. Sharma conducted a study concluding that extensive and intensive experimental results are lacking to validate numerical and

Forced Convection Studies with Different Geometries in Tube Bank Arrangement Using CFD

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ABSTRACT: Heat transfer to or from a bank (or bundles) of tubes in cross flow heat exchanger is relevant to numerous industrial applications; such as, steam generation in a boiler or air cooling in the coil of an air conditioner. The purpose of this research work is to find out the effect of horizontal pitch on the Nusselt number and friction factor of tube. The compact tube bank arrangement experiences high convective resistance on air side, due to low convective heat transfer coefficient. The arrangement of seven cylinders in triangular arrangement is made in such a way that maximizes the turbulence of air in the tube bank arrangement. The numerical analysis of this tube bank arrangement with Ansys fluent is carried out. This work consists of circular and diamond shape tubes, with different value of pitch for maximum heat transfer. The increase in turbulence will increase the convective heat transfer coefficient of air due to better mixing of air. The circular tube & diamond shape tube bank have maximum Nusselt no at horizontal pitch of 2.5D & 3D respectively. The value of coefficient of friction should be minimum so that there will be less pressure drop. The circular & diamond shape tube have least values of coefficient of friction at horizontal pitch of 3D

Key words: Convection, Geometry, CFD, Nusselt Number, HT

I. INTRODUCTION

The heat transfer in tube bank arrangement in cross flow heat exchanger has wide range of applications, such as steam generation in boiler or air cooling in the coil of an air conditioner. In energy transfer related applications, heat exchanger performance is of great importance in meeting today's stringent energy efficiency standards with low cost and less environmental impact. In the liquid-to-gas and phase-change heat exchangers, typical to many Heating, Ventilating and Air Conditioning & Refrigeration (HVAC&R) systems, the gas-side thermal resistance contributes heavily to the overall thermal resistance. Fin-and-tube heat exchangers have been widely applied in lots of fields, such as energy, power, chemical, food, and refrigeration. Improved heat transfer performance will have a significant impact on the energy crisis. For the gas-to-liquid fin-and tube heat exchanger, a high thermal resistance exists because of the poor thermo physical property of air. For example, the airside thermal resistance can comprise 75% of the total thermal resistance in an evaporator and 95% in a condenser for typical refrigeration systems. Researchers are devoted to developing the enhanced heat transfer surfaces, especially on the air side. Generally, in tube bank arrangement the fluid moves inside the tubes while second fluid moves outside the tubes. So, with the help of better mixing of fluids by providing different tube bank arrangement the heat transfer can be enhanced. The spacing between the rows of tubes have

significant effect on the heat transfer and skin friction coefficient of tubes. The prime motive of this work is to find out the effect of horizontal pitch on the convective heat transfer coefficient as well as on the skin friction coefficient. So the development of the higher effective heat exchanger requires a larger contact area for heat transfer with reduced volume. Such larger contact area is easily achieved by passing one fluid through a number of small channels or tubes. This process with an array of the cylinder leads towards the development of a new class of heat exchanger, as tube banks. The tube bank is a special case of the heat exchanger, where the heat interaction is between the hot fluids flowing through a number of small tubes and cold fluid usually passes over the tube surface along the cross direction. There are several techniques commonly used to increase the heat transfer rate by improving thermal contact between the heat exchanger fluid and wall. Themost common methods typically manipulate the surface, including its roughness, use of coiled tubes and vortex generators.

II. LITERATURE REVIEW

Smith et al[2] have investigated experimentally the effect of Reynolds number on the nusselt number and skin friction coefficient in tandem arrangement with uniform heat flux over the tubes. The results presented by the author suggest that Nusselt number have strong dependency on cone angles, tail length ratio and Reynolds number. The heat transfer and friction factor will increase with cone angle

Effect of layer height on final dimensional accuracy of SLM printing machine

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Abstract: Selective laser melting technology which rapidly growing technology in the additive manufacturing process. Additive manufacturing is influenced by so many parameters majorly laser power, scan speed, scanning strategy, layer height, support structure, laser diameter, hatch space etc. These are the various parameters which may influence properties of the resulting part. To study the influence of layer height on the final part we have simulated the rocker arm for different layer heights taken 30, 40, 50 and 60 microns. We have studied the displacement and displacement in 3 direction, plastic strains, vonmisses stresses nodal temperature and temperatures, form this study can say that the layer height 50 and 60 microns has very close results and plastic strain become constant. To print the rocker arm we go for 40 or 50 microns.

Key words: SLM, AM, 3D Printing, Plastic strains, Von-missess stresses

I. INTRODUCTION

Selective Laser Melting (SLM) is a metal additive manufacturing (AM) process wherein a laser beam is used to melt and fuse metal powder layer by layer to create a part. This technology is considered to be one of the upcoming techniques to manufacture near net shape components for industries like automobile, aerospace, defence and biomedical. Further, due to layer by layer building approach, this process enables to fabricate components with complex shapes using volume optimization techniques like topology optimization (TO). Brackett et al. (2011) reviewed the feasibility of implementation of topology optimization to additive manufacturing techniques. They reported that TO designs can be effectively employed to manufacture products using AM with a significant improvement in TO methods. Furthermore, Brandt et al. (2013) employed the SLM technique to fabricate an optimized design of an aerospace bracket. They described various strategies to improve the manufacturability of the 2 optimized designs using the SLM process. However, to realize the full potential of TO, the AM processes have to be fully optimised, as reported in detail by Zegard and Paulino (2016).

Till date, most of the studies have been carried out to assess the feasibility of SLMprintability of a variety of engineering materials. Yap et al. (2015) reviewed different materials that were being employed in the SLM process along with their applications. They reported that most engineering materials like aluminium, steels, cobalt- and nickel-based superalloys, and titanium alloys are being studied for printability using SLM. However, to fabricate

functional parts using SLM process, considerable research is required to obtain fully dense metal components by selection of optimum process parameters. For example, Yasa and Kruth (201 1) printed single layers of 316L stainless steel to study the effect of SLM process parameters on density and microstructure. They reported that even though SLM process is capable of producing parts with densities of 98-99%, the remaining porosity of even 1-2% would render the as-built SLM parts not suitable for high strength and load bearing applications in aerospace and defence industries. Therefore, it is vital that a comprehensive understanding of the SLM process is developed to achieve desired properties. SLM is a complex additive manufacturing process that involves understanding the interaction between various parameters relating to materials, machine, as well as fabrication aspects. Irrinki et al. (2016) found that the powder parameters like particle size and shape along with powder atomization process affect the density and mechanical properties of SLM printed parts. Moreover, Attar et al. (2015) studied the influence of particle morphology on the density of in-situ Ti-TiB composite material parts fabricated via SLM. The relative density of the samples produced using spherical particles was 99.5% when compared to samples printed using irregular shaped particles having a relative density of about 95%. On the contrary, powder characteristics are external parameters as they are usually supplied by either the machine manufacturers or powder-manufacturing suppliers. Furthermore, SLM machine parameters like laser type, maximum laser power and laser wavelength are machine dependent parameters and are restricted in terms of improving the properties of as-built SLM parts. Hence,

3D Printing Thermo-Mechanical Analysis of Carburettor for Optimized Support Structure Orientation for SLM 280 Machine

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ABSTRACT: Carburettor manufacturing is one of the challenging manufacturing process which takes high production time. This can be reduced with great interest if we take manufacturing in to account. Here we would like to manufacture the carburettor by using metal LPBF process. Metal AM process is rapidly growing technology. In metal AM process the complexity of the object is not considered. The quality of the final printed parts depends on the so many factors like laser power, scanning strategy, scanning speed, hatch distance, layer height etc… Among all the process parameters print orientation plays major role in consumption of support material and support printing time. To make the manufacturing easier and to meet less production times we have performed 3D printing simulation for different orientation. This study concentrates on material consumption, printing time, and thermo-mechanical properties and analyzes the best orientation for printing the carburettor and by optimizing the printing orientation cost.

Key words: 3D Printing, SLM280, Optimization, structure, Carburettor

I.   INTRODUCTION

Engine works on fuel. The earliest form of fuel supply mechanism for modern automobile is carburettor. The primary function of carburettor is to provide the air-fuel mixture to the engine in the required proportion. ¬The goal of a carburettor is to mix just the right amount of gasoline with air so that the engine runs properly. If there is not enough fuel mixed with the air, the engine "runs lean" and either will not run or potentially damages the engine. If there is too much fuel mixed with the air, the engine runs rich and either will not run (it floods), runs very smoky, runs poorly (bogs down, stalls easily), or at the very least wastes fuel. The carburettor is in charge of getting the mixture just right.

1.2 Carburettor Basics

A carburettor basically consists of an open pipe through which the air passes into the inlet manifold of the engine. The pipe is in the form of a venturi: it narrows in section and then widens again, causing the airflow to increase in speed in the narrowest part. Below the venturi is a butterfly valve called the throttle valve - a rotating disc that can be turned end-on to the airflow, so as to hardly restrict the flow at all, or can be rotated so that it almost completely blocks the flow of air. This valve controls the flow of air through the carburettor throat and thus the quantity of air/fuel mixture the system will deliver, thereby regulating engine power and speed. The throttle is connected, usually through a cable or a mechanical linkage of rods and joints or rarely by pneumatic link, to the accelerator on a motorbike or the equivalent control on other vehicles or equipment.

Fuel is introduced into the air stream through small holes at the narrowest part of the venturi and at other places where pressure will be lowered when not running on full throttle. Fuel flow is adjusted by means of precisely-calibrated orifices, referred to as jets, in the fuel path.
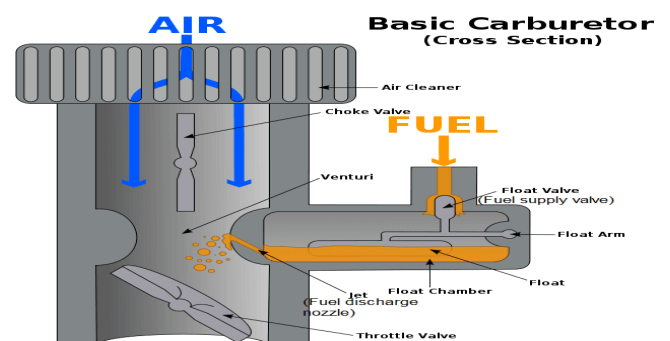
FIG 1: Carburettor Basics

1.2.1 Parts of Carburetor

1.   A carburettor is essentially a tube.

Optimization of Laser Power to Avoid the Thermal Stress in The Metal Am Process to Avoid Lift Off of the Build Part

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ABSTRACT: This investigation uses a complex geometry which combines both straight edges and a rounded feature, allowing for the in-depth analysis of the effects of laser power on Ti-6Al-4V alloy parts produced by additive manufacturing. The printing study was carried out using the laser beam powder bed fusion technique (SLM 280 HL). The laser power was altered in the range of 500 to 600 W, in order to evaluate the effects of changing the input energy received by the powder particles on the as-built parts. The impact of changing laser power was investigated based on printed part dimensions, displacement, plastic strain, von-mises stress, nodal temperature, temperature. It was determined that laser power has a direct influence on dimensional accuracy, displacement, plastic strain, parts printed at the higher power. The laser power optimized at 550 W where the minimum displacement, plastic strain, von-mises stress and minimum temperature are getting minimum values.

Key words: Optimization, Laser Power, Thermal stresses, Plastic strain,, Von-misses stress

I. INTRODUCTION

Selective Laser Melting (SLM) is a metal additive manufacturing (AM) process wherein a laser beam is used to melt and fuse metal powder layer by layer to create a part. This technology is considered to be one of the upcoming techniques to manufacture near net shape components for industries like automobile, aerospace, defence and biomedical. Further, due to layer by layer building approach, this process enables to fabricate components with complex shapes using volume optimization techniques like topology optimization (TO). Brackett et al. (2011) reviewed the feasibility of implementation of topology optimization to additive manufacturing techniques. They reported that TO designs can be effectively employed to manufacture products using AM with a significant improvement in TO methods. Furthermore, Brandt et al. (2013) employed the SLM technique to fabricate an optimized design of an aerospace bracket. They described various strategies to improve the manufacturability of the 2 optimized designs using the SLM process. However, to realize the full potential of TO, the AM processes have to be fully optimised, as reported in detail by Zegard and Paulino (2016).

Till date, most of the studies have been carried out to assess the feasibility of SLM printability of a variety of engineering materials. Yap et al. (2015) reviewed different materials that were being employed in the SLM process along with their applications. They reported that most engineering materials like aluminium, steels, cobalt- and nickel-based superalloys, and titanium alloys are being studied for printability using SLM. However, to fabricate functional parts using SLM process, considerable research is required to obtain fully dense metal components by selection of optimum process parameters. For example, Yasa and Kruth (2011) printed single layers of 316L stainless steel to study the effect of SLM process parameters on density and microstructure. They reported that even though SLM process is capable of producing parts with densities of 98-99%, the remaining porosity of even 1-2% would render the as-built SLM parts not suitable for high strength and load bearing applications in aerospace and defence industries. Therefore, it is vital that a comprehensive understanding of the SLM process is developed to achieve desired properties. SLM is a complex additive manufacturing process that involves understanding the interaction between various parameters relating to materials, machine, as well as fabrication aspects. Irrinki et al. (2016) found that the powder parameters like particle size and shape along with powder atomization process affect the density and mechanical properties of SLM printed parts. Moreover, Attar et al. (2015) studied the influence of particle morphology on the density of in-situ Ti-TiB composite material parts fabricated via SLM. The relative density of the samples produced using spherical particles was 99.5% when compared to samples printed

Effect of Layer Height and Printing Speed on Print Time Estimation and Cost Analysis

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ABSTRACT: The 3D printing process is a kind of additive manufacturing, that the basic principle of this process is adding material layer by layer to form a product. The purpose of this research was to study the effect of layer thickness and printed speed on CNC cutting tool for making casting replica. In this we are varying the layer thickness and printing speed on material consumption and printing speed. In this study by varying the layer thickness and printing speed time also varying. As the layer height increasing printing time decreasing similarly, as the printing speed increasing printing time decreasing. But by increasing the layer height dimensional accuracy of the final printed part is decreasing. Similarly, as the printing speed increases the bond between the layers is decreases. In same way by increasing the layer height and printing speed surface roughness increasing.

Key words: Printing speed, print time, CNC, layer height, surface roughness

I. INTRODUCTION

3D printing or additive manufacturing (AM) is any of various processes for making a three-dimensional object of almost any shape from a 3D model or other electronic data source primarily through additive processes in which successive layers of material are laid down under computer control. A 3D printer is a type of industrial robot. Early AM equipment and materials were developed in the 1980s. In 1984, Chuck Hull of 3D Systems Corp, invented a process known as stereo lithography employing UV lasers to cure photopolymers. Hull also developed the STL file format widely accepted by 3D printing software, as well as the digital slicing and infill strategies common to many processes today. Also, during the 1980s, the metal sintering forms of AM were being developed (such as selective laser sintering and direct metal laser sintering), although they were not yet called 3D printing or AM at the time. In 1990, the plastic extrusion technology most widely associated with the term "3D printing" was commercialized by Stratasys under the name fused deposition modelling (FDM). In 1995, Z Corporation commercialized an MIT-developed additive process under the trademark 3D printing (3DP), referring at that time to a proprietary process inkjet deposition of liquid binder on powder. AM technologies found applications starting in the 1980s in product development, data visualization, rapid prototyping, and specialized manufacturing. Their expansion into production (job production, mass production, and distributed manufacturing) has been under development in the decades since. Industrial production roles within the metalworking industries achieved

significant scale for the first time in the early 2010s. Since the start of the 21st century there has been a large growth in the sales of AM machines, and their price has dropped substantially. According to Wohlers Associates, a consultancy, the market for 3D printers and services was worth $2.2 billion worldwide in 2012, up 29% from 2011. Applications are many, including architecture, construction (AEC), industrial design, automotive, aerospace, military, engineering, dental and medical industries, biotech (human tissue replacement), fashion, footwear, jewellery, eyewear, education, geographic information systems, food, and many other fields.

1.1 3D PRINTER

3D-Printer is a machine reminiscent of the Star Trek Replicator, something magical that can create objects out of thin air. It can "print" in plastic, metal, nylon, and over a hundred other materials. It can be used for making nonsensical little models like the over-printed Yoda, yet it can also print manufacturing prototypes, end user products, quasi-legal guns, aircraft engine parts and even human organs using a person's own cells. We live in an age that is witness to what many are calling the Third Industrial Revolution. 3D printing, more professionally called additive manufacturing, moves us away from the Henry Ford era mass production line, and will bring us to a new reality of customizable, one-off production. 3D printers use a variety of very different types of additive manufacturing technologies, but they all share one core thing in common: they create a three-dimensional object by building it layer by successive layer, until the entire object is complete. It's much like printing in two

Buckling Analysis of Cantilever Twisted FGM Plate for Buckling Load and Non-Buckling Dimensional Buckling Load

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ABSTRACT - **The demand and application of composites are increasing nowadays. Composite materials in the form of plate or plate-like structures are widely used in wind turbine blades and ship building due to its high specific strength and stiffness. For high thermal applications, Functionally Graded Materials (FGM) are used in preference to laminated composites because of its good performance in the thermal field. The pre-twisted cantilever plates have major use in turbine blades, fan blades, compressor blades, chopper blades, marine propellers and chiefly in gas turbines. These structures are often subjected to thermal environments, and hence FGMs are a good alternative to metal plates. The present work deals with the study of buckling analysis of cantilever twisted functionally graded material plates. The analysis is done by using ANSYS, and the results are validated using ABAQUS. A SHELL-281 element having six degrees of freedom per node is employed in ANSYS. The functionally graded material plate with a uniform variation of the material property through the thickness is estimated as a laminated section containing number of layers, and each layer is taken as isotropic. The power law is used to determine material properties in each layer. From convergence studies, ten by ten mesh and twelve number of layers are found to give good accuracy. Buckling behavior of cantilever twisted FGM plate for the various parameters like twist angle, side to thickness ratio, aspect ratio and gradient index are studied.**

Key words: Buckling, Cantilever, Ansys, FGM, Property

I.   INTRODUCTION

A composite material is a structural material made from two or more constituent materials with significantly distinct physical or chemical properties, which when fused produce a material with characteristics unlike that of the individual components. The main advantage of a composite material is that they are light as well as strong. Functionally Graded Materials (FGM) are a set of composites that exhibit a uniform change of material properties from one face to another and hence eliminate the stress concentration, normally encountered in laminated composites. The characteristics of these FGM's are the ability to yield a new composite material with uniform composition variation from thermal resistant ceramics to fracture resistant metals. The FGM concept originated in the year 1984 in Japan during a space research program. This program envisaged the manufacture of a temperature resistant material to resist a temperature of 2000 Kelvin and a temperature gradient of 1000 Kelvin having a thickness below 10mm. The structural component of an FGM can be characterized by the material constituents. It shows the rate of change of material properties. The gradient index governs the

chemical configuration, geometric configuration and physical state of FGM. Primarily FGM involves two material mixtures in which material configuration changes from one surface to another. Variation of porosity from one face to another face also yields functionally graded material. A steady rise in porosity builds impact resistance, thermal resistance, and low density. These FGM's have significant applications in civil and mechanical structures including Thermal structures like Rocket heat shield, heat exchanger tubes, wear resistance linings, thermos-elastic generators, diesel and turbine engines etc. The major applications of pre-twisted cantilever panels are in turbine blades, fan blades, compressor blades, chopper blades, marine propellers and chiefly in gas turbines. Nowadays, in research field the twisted plates have become key structural units. Because of the use of twisted panels in turbomachinery, aerospace and aeronautical industries, it is necessary to understand both vibration and buckling characteristics of the pre-twisted panels.

1.2   Importance of Present study

Composite materials in the form of plate or plate-like structures are widely used in wind turbine blades and a

Design and Analysis of an Uneven Terrain Freight Transportation Mechanism

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ABSTRACT: Wheels are optimal only in highly selective sites or limited artificial environment that we purposefully design to allow wheeled locomotion. They exhibit poor performance in variable terrain and is subjected to large scale wear and tear. Using idea of Theo Jansen's kinetic sculptor this paper aims to create a legged mechanism which can be used as an alternate for tyres over rough terrains. It is an 8-bar mechanism that mimic nature and come up with smooth walking pattern even in rough terrain. The system minimizes the loss of energy during locomotion and allows the vehicle to maintain a constant velocity and height over variable terrain. It is a single degree freedom system and foot of the system traces an ovoid path. The system is expected to have a large social impact as it reduces the cost involved in transportation over uneven terrains and reduces physical load for workers. It finds application in various industries like mining, military purpose etc. In this work a 4-legged Theo Jansen walking mechanism was designed using Catia modelling and a structural analysis on the same was carried out. Also, a real time working model of this mechanism was fabricated.

Key words: Design, Analysis, Mechanism, CATIA, Fabrication

INTRODUCTION AND LITERATURE REVIEW

Humans are mainly using wheeled vehicles for on the ground transportation. But if we look around in the nature, there is no biological creature moving on wheels. To move on the ground, living creatures use legs or crawl. Wheels are optimal only in highly selective sites or limited artificial environment that we purposefully design to allow wheeled locomotion. They exhibit poor performance in variable terrain and is subjected to large scale wear and tear. Compared to wheel locomotion, walking has many advantages: lower energy consumption, no need for roads, better to cross over obstacles, the contact with ground is in a determined point, the ground is damaged less. Hence, the scientists are trying to design vehicles which are using legs or other locomotion ways that are inspired from nature. The purpose of this study is to contribute to the area of mechanism design and optimization of a single-degree-of-freedom leg mechanism. The leg mechanism is considered to be very energy efficient especially when walking on rough terrains. This paper describes the design and fabrication process of a 2n-legged passive walker based on the work of Theo Jansen; the primary focus of this paper is the design of a crank-based leg linkage. Walking machines possess several advantages over wheeled machines in areas of variable terrain. Consider a wheel moving a constant velocity V; every point on its perimeter is moving at a constant velocity V tangent to the curve of the wheel as shown in Figure 1.1. A comparable walking mechanism would be one which moves at a constant velocity V, and where the "foot" of the walker traces out a similar circular path with a constant velocity V at all points on the path (also shown in Figure 1.1). The most obvious advantage of the foot over the wheel is that the foot may step over inconsistencies in the terrain. Local maxima and minima may be completely avoided by simply stepping over them. This results in less loss of energy during locomotion and allows the vehicle to maintain a constant velocity and height over variable terrain.
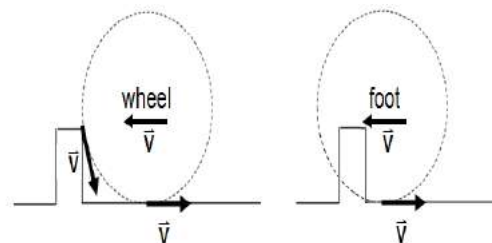
Fig 1.1. Comparison of wheel and foot response to a local maximum in the terrain.

The dotted lines indicate the perimeter of the wheel or the path of the foot. The arrows indicate the direction of movement. The foot may step over the obstacle completely, while the wheel must move over the obstacle. Now consider a case where the comparable foot and wheeled systems

DOI : 10.35291/2454-9150.2022.0256

Design and Rigid Dynamic Analysis of Engine Cylinder with Integrated Mass Optimization of Connecting Link to Reduce the Weight for Maximum Stiffness Condition

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ABSTRACT: The connecting rod is the intermediate member between the piston and the Crankshaft. Its primary function is to transmit the push and pull from the piston pin to the crank pin, thus converting the reciprocating motion of the piston into rotary motion of the crank. This paper describes designing and Analysis of connecting rod. Currently, existing connecting rod is manufactured by using Forged steel. In this, drawing is drafted from the calculations. A parametric model of Connecting rod is modelled using SOLIDWORKS software and to that dynamic motion analysis is performed and structural results generated from the motion condition to study the stress values. For the developed stress analysis at different RPM's have been calculated and mass optimization for maximum stiffness condition is performed to reduce the weight of the connecting rod for developed stress values. By performing the analysis, we have reduced the weight of the connecting rod.

Key words: Optimization, Link, Weight, stiffness, Connecting rod, Solidworks

I. INTRODUCTION

Connecting rod interconnects the piston and the crank shaft and transmits the gas forces from the piston to the crankshaft. Its primary function is to transmit the push and pull from the piston pin to the crank pin and thus convert the reciprocating motion of the piston into rotary motion of the crank. Generally connecting rods are manufactured using carbon steel and in recent days aluminium alloys are finding its application in connecting rod. In this work connecting rod is replaced by aluminium based composite material. And it also describes the fabricating and testing of connecting rod. It consists of a long shank a small end and big end. The small end of connecting rod is usually made in the form of an eye and is provided with a bush. It is connected to the piston by means of piston pin. The big end of connecting rod is connected to the crank by means of damping. Connecting rod has three main zones. The piston pin end, the centre shank and the big end. The piston pinned is the small end, the crank end is the big end and the centre shank is of I cross section. Connecting rod is a pin jointed strut in which more weight is concentrated towards the big end. Connecting rod is acted upon by gas loads and inertia loads during its operation. The forces include gas forces due to combustion and inertia forces due to its own weight. The automobile engine connecting rod is a high-volume production, critical component. Every vehicle that uses an internal combustion engine requires at least one connecting rod depending upon the

number of cylinders in the engine. Connecting rods for automotive applications are typically manufactured by forging from either wrought steel or powdered metal. They could also be cast. However, castings could have blow - holes which are detrimental from durability and fatigue points of view. The fact that forgings produce blow-hole-free and better rods gives them an advantage over cast rods. Between the forging processes, powder forged or drop forged, each process has its own pros and cons. Powder metal manufactured blanks have the advantage of being near net shape, reducing material waste. However, the cost of the blank is high due to the high material cost and sophisticated manufacturing techniques. With steel forging, the material is inexpensive and the rough part manufacturing process is cost effective. In this work connecting rod is replaced by aluminium based composite material and it also describes the design and analysis of connecting rod. Generally connecting rods are manufactured using carbon steel and in recent days aluminium alloys are used. Durability is one of the critical importance of this component, the critical importance of this component, this can be achieved by getting the knowledge about different aspects such as production technology, materials, performance simulation, and fatigue. When building a high-performance engine, great attention is paid to the connecting rods, eliminating stress risers by such techniques as grinding the edges of the rod to a smooth radius, shot peening to induce compressive surface stresses (to prevent crack initiation). Time and

Design and Simulation of Disc Brake Rotor by Using Taguchi Analysis to Study the Major Influence on Mechanical Behaviour of Bajaj Pulsar 150cc

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ABSTRACT: Braking system is the major part of the vehicle in order to slow down and stop the vehicle. Disc brakes were most popular on sports cars when Disc brakes were first introduced, since these vehicles are more demanding about brake performance. Disc brakes are more common form in most passenger vehicles, although many (particularly light weight vehicles) use drum brakes on the rear wheels to keep costs and weight down as well as to simplify the provisions for a parking brake. As the front brakes required most of the braking effort, this can be a reasonable compromise. Many early implementations for automobiles located the brakes on the inboard side of the driveshaft, near the differential, while most brakes today are located inside the wheels. An inboard location reduces the unsparing weight and eliminates a source of heat transfer to the tires. Here we are studying the disc brake of BAJAJ pulsar by suing Taguchi analysis to optimize the disc for maximum brake condition. To optimize the disc brake we have taken the 3 * 3 TAGUCHI method. We have taken the outer radius and inner radius and thickness of the disc brake. We have optimized for better performance.

Key words: Design, Simulation, Taguchi, Mechanical Behaviour, Breaking system

I.   INTRODUCTION

In recent years, brake systems have undergone tremendous changes in terms of performance, technology, design and safety.

A brake is device means of which artificial frictional resistance is applied to moving machine member, in order to stop the motion of a machine. In the process of performing this function, the brakes absorb either kinetic energy of the moving member or the potential energy given up by objects being lowered by hoists, elevators etc.

The energy absorbed by brake is dissipated in the form of heat. This heat is dissipated in the surrounding atmosphere to stop the vehicle, so the brake system should have following requirements:

- The brake must be strong enough to stop the vehicle with in minimum distance in an emergency.
- The driver must have proper control over the vehicle during braking and vehicle must not skid.

- The brakes must have well anti-fade characteristics i.e. their effectiveness should not decrease with Constant prolonged application.

1.1   PRINCIPLE OF BRAKING

Braking system is necessary in an automobile for stopping the vehicle. Brakes are applied on the wheels to stop or to slow down the vehicle.

"The kinetic energy due to motion of the vehicle is dissipated in the form of heat energy due to friction between moving parts (Wheel or Wheel drum) and stationary parts of vehicle (brake shoes)".

Brakes operate most effectively when they are applied in manner so that wheels do not lock completely but continue to roll without slipping on the surface of road.

1.2   FUNCTION OF VEHICLE BRAKING

- To slow down or stop the vehicle in the possible time at the time of need.
- To control the speed of vehicle at turns and also at the time of driving down on hill slope.

Determination of Optimum Scanning Speed to Regulate Performance Characteristics of Spur Gear Through Simulation of 3D Printing

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ABSTRACT: Gears are commonly used for transmitting power. They develop high stress concentration at the root and the point of contact. We have performed the 3D printing simulation to spur gears to study the effect of laser scanning speed on capturing the geometry and minimum stresses and displacements. The laser transferred energy decreased with the increase of scan speed, which cause more holes and cracks in the alloy. The smaller scan speed causes low bond strength and leads to porosity. Due to presence of porosity in the gear will affect strength and life of the spur gear. To avoid these problems, we have optimized the scanning speed to decrease the porosity in the final printed component. Due to increase in scanning speed dimensional accuracy of the final printed part will decrease due to overrun of the laser. If the scanning speed decreases over melting of the power will occur and larger melt pools will be created and surface roughness will be increased due to this very rough surface generates. To avoid these problems, we have optimized the laser power for optimized scanning speed.

Key words: Optimization, Scanning speed, Simulation, 3D printing, overrun

I.   INTRODUCTION

Gears are used for a wide range of industrial applications. They have varied application starting from textile looms to aviation industries. They are the most common means of transmitting power. They change the rate of rotation of machinery shaft and also the axis of rotation. For high-speed machinery, such as an automobile transmission, they are the optimal medium for low energy loss and high accuracy. Their function is to convert input provided by prime mover into an output with lower speed and corresponding higher torque. Toothed gears are used to transmit the power with high velocity ratio. During this phase, they encounter high stress at the point of contact. A pair of teeth in action is generally subjected to two types of cyclic stresses:

i) Bending stresses inducing bending fatigue

ii) Contact stress causing contact fatigue.

Both these types of stresses may not attain their maximum values at the same point of contact. However, combined action of both of them is the reason of failure of gear tooth leading to fracture at the root of a tooth under bending fatigue and surface failure, due to contact fatigue. When loads are applied to the bodies, their surfaces deform elastically near the point of contact. The highest stresses exist at regions where the lines are bunched closest together.

The highest stress occurs at two locations:

A. At contact point where the force F acts

B. At the fillet region near the base of the tooth.

The surface failures occurring mainly due to contact fatigue are pitting and scoring. It is a phenomenon in which small particles are removed from the surface of the tooth due to the high contact stresses that are present between mating teeth. Pitting is actually the fatigue failure of the tooth surface. Hardness is the primary property of the gear tooth that provides resistance to pitting. In other words, pitting is a surface fatigue failure due to many repetitions of high contact stress, which occurs on gear tooth surfaces when a pair of teeth is transmitting power. Gear teeth failure due to contact fatigue is a common phenomenon observed. Even a slight reduction in the stress at root results in great increase in the fatigue life of a gear.

Structural Analysis of Earth Auger Bit

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ABSTRACT: Earth Auger as we all know is a vital part in Drilling all Holes in the ground be that a simple hanging bar to one of the most complex rockets. Quite possibly the most important parts of Earth Auger are a Auger bit. So, it is vital to strengthen this important aspect to ready it for any use. Our fundamental objective behind this paper is to study the Earth Auger bit in detail while doing analysis using ANSYS and testing various materials with different moments and by applying load on Auger bit. Our main spotlight will be on deformation and stress analysis using Structural steel , Stainless steel (ss304) and Gray cast Iron Auger bit on ANSYS. The significance of this analysis becomes more important as it reduces various expenses and labor effort.

Key words: Auger Bit, Structural steel , Stainless steel , Gray cast iron Bits , ANSYS.

I. INTRODUCTION

EARTH AUGER

The modified auger is easy to carry and transport one place another. Its designed structure help to reduce the injuries and accidents. Also, its drill bit can drill hole on many types of soils. Material used to make frame able to sustain vibrations and forces acting on it. Our aim to make earth auger more use friendly and to avoid accidents and health disorder related to it.

HISTORY

An earth   auger, earth   drill,   or post-hole   auger is a drilling tool or machine used for making holes in the ground. It typically consists of a rotating vertical metal rod or pipe with one or more blades attached at the lower end, that cut or scrape the soil.

Metal augers have been in use since the Middle Ages to drill holes in wood. In the 19th century, the hand-operated earth auger became a common farm and construction tool in the US, and several inventors submitted patents for them. An example is the design of a certain M. Hubby of Maysfield, Texas, consisting of an open hollow cylinder with two blades at the bottom edge.

The first known power earth auger was built in 1943 by John Habluetzel , a farmer in Wamego, Kansas, from parts scavenged from other equipment, including a 7-inch helical blade from a screw separator. It was attached to a tractor and could be operated by the driver from his seat. It dug one 2.5-foot-deep hole every minute. His invention was featured in the Kansas State Board of Agriculture's 35th Biennial Report. He went on to dig holes for other farmers at 10 cents per hole, a side business that he operated well into the 1950s. He donated his invention to the Kansas Museum of History in 1999

There are a number of varieties of the tools known as **earth augers**. If you are looking for a large cutting tool that can remove a lot of earth at one time, then an earth auger is ideal. However, as well as being small hand-held tools, they can also come as very powerful earth-movers, digging holes up to 7 feet deep. There are many different types of earth auger, so you should know as much as you can about these different types of earth auger, and what will be best for you.

II. TYPES OF AUGER BITS

WOOD BORING AUGER BITS:

This is the one of the most common type of auger bit and is used for drilling through thick pieces of wood for construction of channels for pipelines or electric cables. A wood boring auger can be defined as a spiral-shaped drill bit that is specifically designed for boring clean, deep holes into the wood. This is the standard type of auger bit which is used in DIY, and can be used simultaneously with hand drills, power drills and drill presses, etc. Stubby wood augers are also used in confined spaces where it is very difficult or just not possible to fit a regular bit. Although being not much popular than some other wood-working bits in home, augers are most often used by construction workers, where drilling to a much greater depth is more frequently required

III. LITERATURE REVIEW

Prof. R.V. Adakane,Sumedh Shastri, Shekhar Kola, Kartik Giri 12 Dec (2020) Design and Development of Earth Auger. The Work aims at design and development of earth auger which would be modification to overcome all the shortcomings of the existing earth auger. The work will

Modeling and 3D Printing Simulation of Jet Engine Propeller with Minimum Printing Time Orientation Optimisation

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ABSTRACT: Turboprop motors are the class of motors that drives the air ship propeller. Turboprop comprises of propeller, blower, burning chambers, turbine, and a spout. It works with less speed, less cost, better eco-friendliness, low climbing pace, less ozone depleting substance discharge and less vibration. The propeller cutting edge and shaft are viewed as the basic pieces of a turboprop motor as they turn at high speeds. To manufacture these propellers by using conventional manufacturing is very difficult. To manufacture these propeller, Additive manufacturing will be the best suitable option. But due to very less thickness manufacturing of propeller is also difficult. Before 3D printing the part, we have simulated the propeller for best optimized orientation for minimum displacement and strains. In this study horizontal printing orientation is the best orientation for LPBF process.

Key words: 3DP, AM, LPBF, Propeller, Simulation

I.   INTRODUCTION

Air ship motors are the real piece of the drive framework in a flying machine and it will create the mechanical power. They are significantly arranged into three sorts. They are turbine motors, cylinder motors and electric engines. The greater part of the air ship motors utilizing today is open rotors/turbofans. These motors will be appropriate for long courses and eco-friendliness of these motors is less contrast with turboprop motors. Turboprop motors are the sorts of air ship motors which drives the propeller. Propeller sharp edge is a critical piece of the motor. Propeller cutting edge will have the airfoil shape which will pivot at fast. As the sharp edge will pivot it will push the air. In the event that the airfoil is of the deviated shape, there will be weight distinction over the cross segment. There will be lift and drag drive following up superficially on account of the weight distinction, Along with these powers there will be streamlined pushed compel acting because of air mass stream and radiating power packaging because of turn. For the plan of the cutting edge we have to consider all the above said powers and furthermore need to locate the regular recurrence of the sharp edge so as to maintain a strategic distance from the reverberation marvels.

1.1.1 INTRODUCTION TO THE PROPELLER

• Propeller changes over rotational power from the motor into push.

• The pivoting sharp edge of a propeller has comparative qualities to a wing going through the air

• A propeller sharp edge produces push F through a streamlined lift compel segment, requests a motor torque Q to conquer streamlined drag, and will slow down if the neighborhood resultant approach of the edge surpasses max

• Additional factors: trailing vortex age, tip misfortunes, compressibility

1.1.2 General Information

Push is the power that moves the air ship through the air. There are distinctive sorts of drive frameworks create push in various ways, in spite of the fact that it ordinarily produced through some utilization of Newton's Third Law. Propeller is one of the impetus framework. The motivation behind the propeller is to move the flying machine through the air. The propeller comprises of at least two edges associated together by a centre point. The centre serves to append the edges to the motor shaft.

Figure 1.1 : Basic nomenclature of an air foil

Fig:1.2 air flow through propeller

DOI : 10.35291/2454-9150.2022.0261

Modelling and Structural Analysis of Pelton Wheel Turbine at Maximum Load Condition

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ABSTRACT:A Pelton turbine bucket is the individual component which makes up the turbine section of a pelton turbine. The blades are responsible for extracting energy from the high pressure water produced by the nozzle jet. The pelton buckets are very often the limiting component of pelton turbines. To survive in this difficult environment, blades often use exotic materials. In this paper a pelton turbine bucket is designed and Modeled in 3D modeling software CATIA. We know that the efficiency is directly related to material performance making the material selection of primary importance. In this paper, materials considered for turbine blades are steel, cast iron and fiber glass reinforced plastic. Optimization is done by different materials by performing coupled field analysis on the turbine blade for both the designs. The objective of this work is to perform coupled field analysis of pelton wheel buckets for various materials and varying the number of buckets on the pelton wheel for finding out the efficiency, high stress handling factors.

Keywords: Pelton wheel, Load condition, Optimization, CATIA V5 software and ANSYS work bench

I. INTRODUCTION

Pelton turbines belong to the family of free jet turbines. A nozzle is placed at the end of the pressure line which converts the potential energy of the water into kinetic energy by forming a water jet. The jet is directed to the runner buckets, the hydraulically active parts of the turbine. At the entrance into the symmetrically shaped buckets the water jet is split into two parts, each developing a sheet of water on the bucket's curved surface. At the end of the working cycle, the water leaves the bucket in the opposite direction of the free jet. The rotational Mechanical energy is then transferred through the shaft to the generator which is produced by the momentum and pressure of the water jet striking the buckets. Pelton turbine basins, single or two pails together are for the most part made by mold throwing. The throwing of basins for Pelton turbines should be possible by replicating from other existing buckets. It is fitting to cast the single cans and, subsequent to machining, to settle them to the rotor plate. In this way convoluted throwing molds can be kept away from. It is not prescribed to make the pails of split channel areas or other welding developments of sheet metal segments, as a result of lacking quality and poor effectiveness. The basins can be made of diverse materials. This is likewise the case if the rotor is cast in one piece. On present day Pelton turbines the basins are basically of cast steel with 13% chrome. However, different materials and routines are additionally utilized, including cast iron, or composites, for example, bronze or aluminum, or infusion forming with fiberglass fortified plastic.

WORKING PRINCIPLE:

- The water is transferred from the high head source through a long conduit called Pen stock.
- Nozzle arrangement at the end of pen stock helps the water to accelerate and it flows out as a high speed jet with high velocity and discharge at atmospheric pressure.
- The jet will hit the splitter of the buckets which will distribute the jet into two halves of bucket and the wheel starts revolving.
- The kinetic energy of the jet is reduced when it hits the bucket and also due to spherical shape of buckets the directed jet will change its direction and take U-turn and fall into tail race.
- In general, the inlet angle of jet is in between 1º to 3º, after hitting the buckets the deflected jet angle is in between 165º to 170º.
- The water collected in the tail race should not submerge the Pelton wheel in any case.
- To generate more power, two Pelton wheels can be arranged to a single shaft or two water jets can be directed at a time to a single Pelton wheel.

INTRODUCTION TO CAD/CAM/CAE:

The Modern world of design, development, manufacturing and so on, in which we have stepped can't be imagined without interference from computers. The usage of

Design and Modelling of Francis Turbine by Using Generative Shape Design

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ABSTRACT: The Francis turbine is a type of water turbine. It is an inward-flow reaction turbine that combines radial and axial flow concepts. Francis turbines are the most common water turbine in use today and can achieve over 95% efficiency. Francis turbines are primarily used for electrical power production. The power output of the electric generators generally ranges from just a few kilowatts up to 1000 MW, though mini-hydro installations may be lower. The best performance is seen when the head height is between 100–300 meters (330–980 ft). Penstock (input pipes) diameters are between 1 and 10 m (3.3 and 32.8 ft). The speeds of different turbine units range from 70 to 1000 rpm. A wicket gate around the outside of the turbine's rotating runner controls the rate of water flow through the turbine for different power production rates. Francis turbines are usually mounted with a vertical shaft, to isolate water from the generator. This also facilitates installation and maintenance. In this paper, we are using static structural analysis. The analysis focuses on stress distribution in the runner blades. It has been found that the maximum stresses due to the water pressure are located at the trailing edge of the runner blade towards the transition between the blade and the crown.

Key words: Design, Modelling, Penstock, Francis turbine, reaction turbine

I.   INTRODUCTION

TURBINE

Turbines convert hydraulic energy or hydro-potential into mechanical energy. Mechanical energy developed by turbines is used to run electric generators coupled to the shaft of turbines. Hydroelectric power is the cheapest source of power generation. Poncelet first introduced the idea of the development of mechanical energy through hydraulic energy. Modern hydraulic turbines have been developed by L.A. Pelton (impulse), G. Coriolis and J.B. Francis (reaction) and V `Kaplan (propeller).

TYPES OF TURBINES

Classifications and types
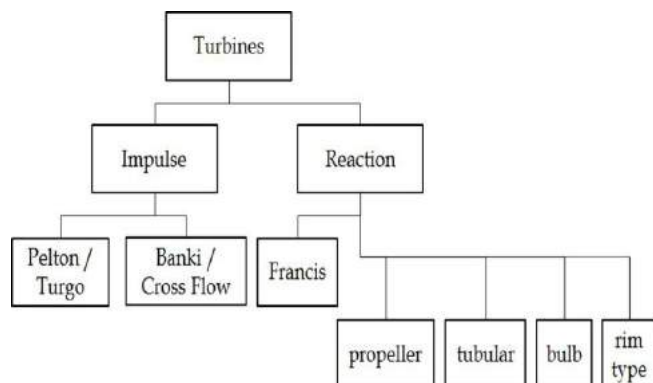
Major Components of Francis Turbines

- Spiral Casing
- Stay Vanes
- Guide Vanes
- Runner Blades
- Draft Tube
- Spiral Casing
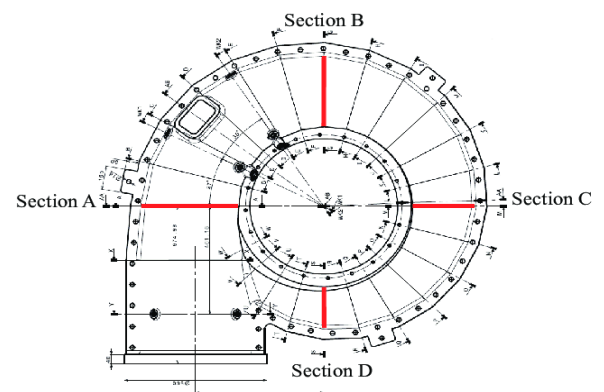
The spiral casing is the inlet medium of water to the turbine. The water flowing from the reservoir or dam is

Optimization of printing process parameters to avoid the plastic strain during the printing of micro channel

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Abstract: The problem of designing a compact high-performance evaporator for miniature refrigeration system has been investigated. Micro cooling channel has multiple applications to transfer the heat and cool the system. To manufacture these micro channels through conventional machining is very difficult to overcome these problems we choose Additive manufacturing to manufacture the model. We choose SLM 280HL printer to simulate the model and we used Altair inspire tool to simulate printing process for different laser powers to find the optimized laser power. Due to very less cross section present in the micro channel very large stress and temperature will be developed. Due to large temperatures the warpage plate will occur, to control this warpage laser power has been optimized to control the warpage of the model. After performing this simulation, the laser optimized at 600W giver better printing results.

Key words: Optimization, strain, micro channel, warpage, SLM 280HL

I. INTRODUCTION

Liquid cooling plates have vast applications in electronic devices, computer processors, automotive engines, etc. Amid dense processing units, temperature stability is of key importance in technological advancement. Multitask processors are widely used in this techno-era. Liquid cooling processes in the perspective of system space and working fluid may lead to an appropriate thermal environment. A liquid cooling plate is used for the transmission of heat from hot surfaces of gadgets having a high load to the fluid circulating within a liquid plate system. A number of various heat sink plates have been introduced to manage high heat flux while considering the allowable temperature in electrical equipment [1]. The use of conventional air cooling systems is being outpaced to meet demands of modern high tech appliances [2, 3]. So, liquid cooling plates with micro-channel setups have been considered as a possible method to overcome high power concentrations [4] and hybrid 2 micro-channel systems [5, 6] have been considered as a possible method to overcome high power concentrations. While micro-channel liquid plates may have relatively better thermal performance than their conventional counterparts, they do require high pumping power, and this is due to the enhanced compactness of the flow channels [7]. Consequently, liquid cooling plates having micro-channel setups should be designed carefully with reliable estimates of pressure drop to fulfill cooling demands of high heat flux applications.

Micro-channel cooling is an effective method to enhance cooling for electronic devices. The problem of boundary layer development as a liquid coolant travels downstream persists in convection micro-channel heat sink.
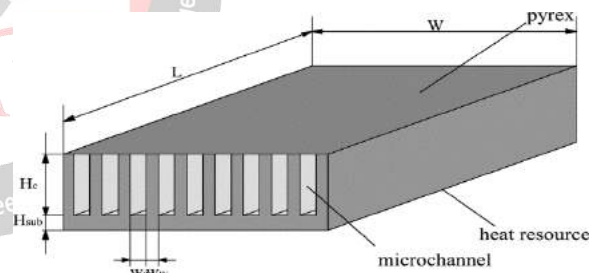
Fig 1.0: Cooling system

1.1 Invention: The use of micro-channel as a visible cooling system was proposed by TUCKER MAN & PEASE (GERMAN ENGINEERS). They designed cooled hat sink by etching micro channel heat sink with 50um wide and 300um height on a silicon substrate. Fluid flow inside channel is at the heart of many natural and man-made systems. Heat and mass transfer is accomplished across the channel walls in biological systems, such as brain, lungs, kidneys, intestines, blood vessels etc.. as well as in man-made systems, such as heat exchanges, nuclear reactions, air separation units, desalination etc…. In general, the transport process occur across the channels walls where as bulk flow takes place through the channel of cross-sectional area. The channel cross section thus serves as a conduct to transport fluid to and away from channel walls

Modelling and Material Optimization of Piston Head to Sustain the Higher Load Conditions Without Failure

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Abstract: Engine pistons are one of the most complex components among all automotive and other industry field components. The engine can be called the heart of a vehicle and the piston may be considered the most important part of an engine. There are lots of research works proposing, for engine pistons, new geometries, materials and manufacturing techniques, and this evolution has undergone with a continuous improvement over the last decades and required thorough examination of the smallest details. Notwithstanding all these studies, there are a huge number of damaged pistons. Damage mechanisms have different origins and are mainly wear, temperature, and fatigue related. But more than wear and fatigue, damage of the piston is mainly due to stress development, namely- Thermal stress, Mechanical stress. This paper describes the stress distribution on piston of internal combustion engine by using FEA. The FEA is performed by CAD and CAE software. The main objectives are to investigate and analyse the thermal stress and mechanical stress distribution of piston at the real engine condition during combustion process. The paper describes the FEA technique to predict the higher stress and critical region on the component. With using solid works software, the structural model of a piston will be developed. Using ANSYS 2021R1 software, simulation and stress analysis is performed.

Key words: Optimization, CAD, CAE, FEA Ansys, Simulation

I. INTRODUCTION

Increasing the performance of an internal combustion engine requires the transformation of total fuel energy to useful energy at the highest as possible. Increase of inner cylinder heat plays important role in the increase of engine performance and decrease of exhaust emissions. It is understood as a result of literature studies that coating combustion chamber elements with thermal barriers contributes a lot to the increase of inner cylinder heat. This study includes an evaluation of experimental studies and its results carried out upon the methods applied on coating with thermal barrier in diesel engines, the effects of coating on the performance of engine and exhaust emissions. Ceramic coatings applied to diesel engine combustion chambers are aimed to reduce heat which passes from in-cylinder to engine cooling system. Engine cooling systems are planned to be removed from internal combustion engines by the development of advanced technology ceramics. One can expect that engine power can be increased and engine weight and cost can be decreased by removing cooling system elements (coolant pump, ventilator, water jackets and radiators etc. It is important to calculate the piston temperature distribution in order to control the thermal stresses and deformations within acceptable levels. The temperature distribution enables the

designer to optimize the thermal aspects of the piston design at lower cost, before the first prototype is constructed. As much as 60% of the total engine mechanical power lost is generated by piston ring assembly Most of the internal combustion (IC) engine pistons are made of aluminium alloy which has a thermal expansion coefficient 80% higher than the cylinder bore material made of cast iron. This leads to some differences between running and the design clearances. Therefore, analysis of the piston thermal behaviour is extremely crucial in designing more efficient engines. The thermal analysis of piston is important from different point of views. First, the highest temperature of any point on piston should not exceed 66% of the melting point temperature of the alloy. This limiting temperature for the current engine piston alloy is about 370 °C. This temperature level can be increased in ceramic coating diesel engines. Ceramics have a higher thermal durability than metals; therefore, it is usually not necessary to cool them as fast as metals. Low thermal conductivity ceramics can be used to control temperature distribution and heat flow in a structure. Thermal barrier coatings (TBC) provide the potential for higher thermal efficiencies of the engine, improved combustion and reduced emissions. In addition, ceramics show better wear characteristics than conventional materials. Lower heat rejection from the combustion chamber through thermally insulated

Reconstruction and Modelling of Hip Joint by Using 3D Slicer and Rapid Prototyping

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ABSTRACT: The use of three-dimensional (3D) printing is becoming more common, including in the field of orthopaedic surgery. There are currently four primary clinical applications for 3D-printing in hip and pelvic surgeries: (i) 3D-printed anatomical models for planning and surgery simulation, (ii) patient-specific instruments (PSI), (iii) generation of prostheses with 3D-additive manufacturing, and (iv) custom 3D-printed prostheses. Simulation surgery using a 3D-printed bone model allows surgeons to develop better surgical approaches, test the feasibility of procedures and determine optimal location and size for prosthesis. PSI will help inform accurate bone cuts and prosthesis placement during surgery. Using 3D-additive manufacturing, especially with a trabecular pattern, is possible to produce a prosthesis mechanically stable and biocompatible prosthesis capable of promoting Osseo integration. Custom implants are useful in patients with massive ace tabular bone loss or periacetabular malignant bone tumours as they may improve the fit between implants and patient-specific anatomy. 3D-printing technology can improve surgical efficiency, shorten operation times and reduce exposure to radiation. This technology also offers new potential for treating complex hip joint diseases. Orthopaedic surgeons should develop guidelines to outline the most effective uses of 3D-printing technology to maximize patient benefits. In this study we are developing the hip joint from the conventional CT/MRI scans to study the hip joint. In this study, the determining factors for hip replacement and the different fabrication techniques such as direct 3D printing, Fused Deposition Modeling (FDM), Selective Laser Sintering (SLS) and stereo lithography(SLA) for hip replacement.

Key words: Modelling, Prototype, 3D Prinint, Tumours, FDM and SLS

I. INTRODUCTION

Three-dimensional (3D) printing technology is additive manufacturing that produces 3D shapes by stacking two-dimensional (2D) cross-sectional shapes with various materials. It is used for laminated manufacturing, such as rapid prototyping (RP). In the early days, there were a number of key limitations in printing materials, moulding time, size, precision and strength of the moulding's, which limited industrial uses. In recent years, however, printing materials have been diversified including metals, and printing equipment has been developed accordingly. The paradigm of industrial use is rapidly changing as the production of complex shapes and customized products become possible. Today, 3D-printing technology can be used to create simulation models or medical implants, thus significantly aiding doctors and medical companies by optimizing the way a surgeon plans and executes a procedure. The application of 3D-printing technology to clinical medicine has already become the fastest growing innovation in the medical field.

The use of 3D-printing in the field of orthopaedic surgery is rapidly increasing. The ease of segmenting bone from computed tomography (CT) scans, and the variety of available 3D printers enables researchers, manufacturers, and surgeons to easily use 3D-printing technology. Over the last decade, there have been significant developments in the orthopaedic surgery field, especially in hip and pelvic surgeries. Many scientific papers have been published regarding research in the field of 3D-printed hip prosthesis.

Currently, the use of 3D-printing technology in hip and pelvic surgeries can be divided into four important categories. First is the development of anatomical models based on patient imaging; these bone models can facilitate an improved understanding of the path-anatomy and surgeons can use it to simulate the surgery to potentially improve execution. Second is the synthesis of patient-specific instruments (PSI) that may increase the accuracy of a surgery; most PSIs are manufactured in the form of guides or jigs. Third is the production of arthroplasty implants; 3D-printed hip implants are advantageous because ingrowth surfaces can be modified to optimize

Mass Optimization of Braking Pedal and Simulating 3D Metal Printing Process to Study the Temperature Distribution

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ABSTRACT: Safety aspect in automotive engineering has been considered as a number one priority in development of new vehicle. Each single system has been studied and developed in order to meet safety requirement. Instead of having air bag, good suspension systems, good handling and safe cornering, there is one most critical system in the vehicle which is brake systems The main objective of the paper is to design of brake pedal and optimizing the brake pedal for minimum thickness and simulating for metal ADDITIVE MANUFACTURING process. Disc brake technology used for bikes has improved significantly as high performance is most desirable now days. More specifically, the paper deals with analysis of brake pedal for minimum mass condition and less weight when compare to that is available on commercial four-wheeler. The FEA analysis determines, the minimum stresses developed in brake pedal when load acting over it. Then simulating the brake pedal for optimal laser conditions to avoid the warpage during the printing process. We have found the optimal laser power for printing the brake pedal. The Brake pedal have more surface area, we need to apply more force on it. We optimize the surface area of Brake pedal to reduce the applying force.

Key words: Optimization, 3D Metal printing, Simulation, AM

I.   INTRODUCTION

A brake is an instrument or equipment that makes use of artificial frictional resistance to stop the motion of a moving member. While performing this function, the brakes imbibe potential energy or kinetic energy of the moving member. The energy that is absorbed by the brakes is dissipated in the form of heat. The dissipated heat is in turn liberated into the surrounding atmosphere.

Fig 1.1-disc brake rotor

Fig 1.2-disc brake assemblies

1.2 BRAKING REQUIREMENTS:

- Brakes of a vehicle should be strong enough to stop the vehicle in a minimum time & distance.
- While braking the driver should have good control over the vehicle i.e. the vehicle should not skid.
- Brakes should be a good anti wear resistant.
- Brakes should have good anti fade characteristics.

1.3 CLASSIFICATION OF BRAKES:

- Based on mode of operation brakes are classified as follows:
- Hydraulic Brakes.
- Electrical Brakes.
- Mechanical Brakes.

The mechanical brakes according to the direction of acting force may be sub divided into the following two groups:

- Radial Brakes
- Axial Brakes.

Radial Brakes. In these brakes the force acting on brake drum is in radial direction for Radial brakes. These brakes are of two types: Internal Brakes and external brakes Axial Brakes. In these brakes the force acting on the brake drum is in axial direction for axial brakes.

A Pure Thermal Analysis of 3D Printing for Different Laser Powers for Optimization Thermal Distribution

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ABSTRACT: Engine pistons arrangement are one of the most complex components among all automotive and other industry field components. The engine can be called the heart of a vehicle and the engine head may be considered the most important part of an engine. There are lots of research works proposing, for engine pistons, new geometries, materials and manufacturing techniques, and this evolution has undergone with a continuous improvement over the last decades and required thorough examination of the smallest details. Not with standing all these studies, there are a huge number of damaged engines. Damage mechanisms have different origins and are mainly wear, temperature, and fatigue related. But more than wear and fatigue, damage of the engine head is mainly due to stress development, namely- Thermal stress, Mechanical stress. Considering the complexity of the component, manufacturing of engine head and other parts of engine cylinder will become very complex. To avoid this we have choose the metal additive manufacturing process to build the engine head but before going for the printing process we have simulated the 3D printing process to optimize the process parameter which is best suited for the printing of engine head. The paper describes the FEA technique to predict the higher stress and critical region on the component to study the displacement, plastic strain, von mises stresses during the printing process. With the help of solid works software, the structural model of a engine arrangement will be developed. Using Altair Inspire software, thermos mechanical simulation has been performed for different laser powers. By performing AM simulation laser power has significant role in quality and dimensional accuracy of the AM build parts. Laser power directly effect the surface roughness and dimensional accuracy of the part.

Key words: 3D Printing„ Thermal Analysis, Optimization, Stress, strain

I. INTRODUCTION

Increasing the performance of an internal combustion engine requires the transformation of total fuel energy to useful energy at the highest as possible. Increase of inner cylinder heat plays important role in the increase of engine performance and decrease of exhaust emissions. It is understood as a result of literature studies that coating combustion chamber elements with thermal barriers contributes a lot to the increase of inner cylinder heat. This study includes an evaluation of experimental studies and its results carried out upon the methods applied on coating with thermal barrier in diesel engines, the effects of coating on the performance of engine and exhaust emissions.

Ceramic coatings applied to diesel engine combustion chambers are aimed to reduce heat which passes from in-cylinder to engine cooling system. Engine cooling systems are planned to be removed from internal combustion engines by the development of advanced technology ceramics. One can expect that engine power can be increased and engine weight and cost can be decreased by removing cooling system elements (coolant pump, ventilator, water jackets and radiators etc.

It is important to calculate the piston temperature distribution in order to control the thermal stresses and deformations within acceptable levels. The temperature distribution enables the designer to optimize the thermal aspects of the piston design at lower cost, before the first prototype is constructed. As much as 60% of the total engine mechanical power lost is generated by piston ring assembly

Most of the internal combustion (IC) engine pistons are made of aluminium alloy which has a thermal expansion coefficient 80% higher than the cylinder bore material made of cast iron. This leads to some differences between running and the design clearances. Therefore, analysis of the piston thermal behaviour is extremely crucial in designing more efficient engines. The thermal analysis of piston is important from different point of views. First, the highest temperature of any point on piston should not exceed 66% of the melting point temperature of the alloy .

Modelling and Topology Optimization of Car Rim to Reduce the Weight of the Wheel for Maximum Stiffness Condition Using Altair Inspire

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ABSTRACT: The wheel is a main mechanical term of the vehicular suspension system that supports the static and dynamic loads encountered during vehicle action. Since cars carry heavy loads of occupants as well as self-weight, the alloy wheel rim should be strong enough to withstand this load. Thus, their design should be done very cautiously. While designing such a main kind of automotive component taking care of protection and cost are very important concerns so that users can use it safely. Major five technical considerations while modelling any new alloy wheel rim are styling, aesthetic, mass, manufacturability, and capability Alloy wheel rims are automobile wheels that are made from an alloy of aluminium or magnesium metals or sometimes a mixture of both. In this study we have performed the mass optimization of wheel rim to reduce the weight of the wheel to perform efficiently in dynamic condition. We have performed the mass optimization for maximum stiffness condition to reduce the weight of the wheel. We have performed the structural analysis before and after the optimization of rim to make sure the stress and displacements results are same for safety conditions.

Key words: Modelling, Topology, Optimization, Rim, Altair, stiffness

I.   INTRODUCTION

Archaeologies and historians of today see the introduction of the wheel as the real genesis of any old civilization. The wheel is the most significant discovery of old times. The wheel has developed from an oversized bearing to a fully integral part of any modern transportation vehicle. Modern motor vehicles are produced according to very strict rules to ensure the safety of passengers.

Materials to produce these wheels have become has sophisticated as a design and material can range from steel to nonferrous alloys like magnesium and aluminium. Automotive wheels have evolved over the decades from early spoke design of wood and steel. Today's modern vehicles are using the stamped metal configuration and modern cast and forged aluminium alloys rims. Since the 1970's several innovative methods of testing well aided with experimental stress measurement have been initiated.

Within the past 10 years, durability analysis (fatigue life predication) and reliability method for dealing with variations inherent in engineering structure have been applied to the automotive wheel Braking performance shows effect on the wheel rim parameters: size, weight, design and materials. The size of the wheel rim governs how much space there is between the rim and brake rotor. If the diameter of the wheel rim is higher there will be more scope for air flow around the brakes and therefore better cooling. The weight of the wheel rim is also an important issue. The handling. A more rigid wheel will reduce wheel flex. This is essentially important with low aspect ratio, high performance tires that can be generate high cornering forces

II.   LITERATURE SURVEY

G. Ashok Kumar, M. Uma Mahesh, S. Madhu Sudan, T. choli raj [1] [Dec -2016 DESIGN AND ANALYSIS OF WHEEL RIM BY USINGCATIA &ANSYS The purpose of the car wheel rim is to provide a firm base on which to fit the tyre. Its dimensions, shape should be suitable to satisfactorily accommodate the particular tyre required for the vehicle. In this study a tyre   of car   wheel rim belonging to the disc wheel category is considered. Design in an important industrial activity which influences the quality of the product. The wheel rim is designed by using modelling software CATIAv5R18.In modelling the time spent in producing the complex 3-D models and the risk involved in design and manufacturing process can be easily minimized. So, the modelling of the wheel rim is made by using CATIA. Later this CATIA model is imported to ANSYS for analysis work. ANSYS software is the latest software used for simulating the different forces, pressure acting on the component and also for calculating and viewing the results. A solver mode in ANSYS software calculates the stresses, deflections, bending moments and their relations without manual interventions, reduces the time compared with the method of mathematical

Design of Precision Steering Mechanism and Motion Study of Ackermann Steering Mechanism for A Four-Wheeler Vehicle with Minimum Error Percentage

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ABSTRACT: Steering systems are used to change the direction of the vehicle. These are essential to provide vehicle safety, steering quality and steering control and used to turn the vehicle without loss of traction and also used to maintain the directional stability of the vehicle. The most commonly used steering geometries are Davis and Ackermann. The types of steering systems are trapezoidal; double trapezoidal and Rack & pinion etc... Direct steering mechanism is rotating the wheel and an indirect steering mechanism is by rotating up and down or pulls and push. Twin lever steering mechanisms is push and pull type and controlled mainly by Bi-articular muscles, making use of advancements in science and technology. The main aim of the paper is to decrease the error percentage associated with the current ackermann steering mechanism. Due to this turning pairs there is an error exist in the mechanism. So by varying the steering arm length and steering arm angle (ackermann angle) we can reduce the error percentage. So by taking different arm angles(ackermann angles),by calculating different error percentages. And consider the angle which produces less error percentage. To perform the analysis on steering arm we choose Ansys software to validate the design of steering arm for applied steering for from the steering wheel. Steering arm is directly connected to wheel hub and rotate the wheel directly.

Key words: Steering Mechanism, Ansys, structural steel, CI

I.   INTRODUCTION

More than hundred years that have passed since the introduction of automobile, it can seen that original method of controlling cars pulled by animals such as horses was by reins. Early automobiles had a single push pull bar which is known as tiller steering. Later on it becomes it became a steering wheel.

The most convectional steering arrangement is to turn the front wheel using a hand –operated steering wheel which is positioned in front of a driver, near the steering column, which may contain universal joints (which may also be part of the collapsible steering column design), to allow it to deviate somewhat from a straight line other arrangements are sometimes found on different types of vehicles for examples, A tiller or rare- wheel steering. Tracked vehicles such as bulldozers and tank usually employ differential steering that is, tracks are made to move at different speeds or even in opposite directions, using clutches and brakes, to bring about a changes of course or direction. To change the vehicle's direction we are using twin lever steering mechanism. Depending on the vehicle's design and construction convenience we choose linkage steering system which four bar mechanism and works on

Ackermann's geometry. According to Ackermann's principle the inner wheel turns more than that of the outer wheel

NORMALSTEERING:

•   The most conventional steering arrangement is to turn front wheels using a hand operated steering wheel.

•   This is positioned in front of the driver , via steering column.

•   Other types of steering are Tiller or Rear wheel steering.

Design and Mass Optimization of Steering Arm for Metal Additive Manufacturing and Simulating 3D Printing Process to Avoid the Wrapage Failure

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ABSTRACT: Steering systems are used to change the direction of the vehicle. These are essential to provide vehicle safety, steering quality and steering control and used to turn the vehicle without loss of traction and also used to maintain the directional stability of the vehicle. The most commonly used steering geometries are Davis and Ackermann. Steering arm is used for transmitting the turning force from the steering gear to the drag link especially of an automotive vehicle. Direct steering mechanism is rotating the wheel and an indirect steering mechanism is by rotating up and down or pull and push. Twin lever steering mechanism is push and pull type and controlled mainly by Bi-articular muscles, making use of advancements in science and technology. In this paper, we have performed the mass optimization of steering arm of Formula 1 car for maximum steering effort and simulated for Metal additive manufacturingprocess to study the effect of printing process parameters before and after optimization of steering arm. When compare to actual model the weight of the optimized steering arm reduced to 30%. We have performed the analysis on steering arm using Inspire software.

Key words: AM, Wrapage failure, INSPIRE, Optimization, Mechanism

I. INTRODUCTION

Steering System

More than hundred years that have passed since the introduction of automobile, it can be seen that original method of controlling cars pulled by animals such as horses was by reins. Early automobiles had a single push-pull bar which is known as tiller steering. Later on it became a Steering wheel.

The most conventional steering arrangement is to turn the front wheels using a hand– operated steering wheel which is positioned in front of the driver, via the steering column, which may contain universal joints (which may also be part of the collapsible steering column design), to allow it to deviate somewhat from a straight line. Other arrangements are sometimes found on different types of vehicles, for example, a tiller or rear– wheel steering. Tracked vehicles such as bulldozers and tanks usually employ differential steering — that is, the tracks are made to move at different speeds or even in opposite directions, using clutches and brakes, to bring about a change of course or direction.
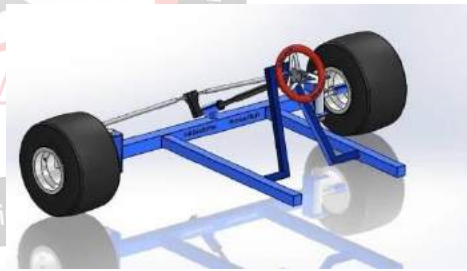
Fig 1: F1 Racing Car Steering System

NORMAL STEERING:
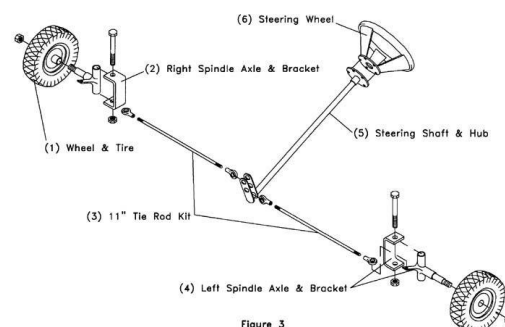
Fig.2 Steering system

The most conventional steering arrangement is to turn front wheels using a hand operated steering wheel. This is

DESIGN AND ANALYSIS OF INDIAN RAIL-WHEEL ASSEMBLY FOR SUPER ELEVATION

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ABSTRACT

Mechanics of the rail-wheel is one of the fundamental areas of the study in the railway engineering. Complicated geometries like rail-wheel problems are solved by using Finite element analysis software. In present years, loads on axle of railway cars increase because increased in transport of goods and faster infrastructural growth. The rail-wheels are subjected to high contact stresses of alternating magnitude. The rail wheel assembly designs in CATIA software and analysis in ANSYS software. The materials assigned for wheel high carbon steel and nickel chromium molybdenum alloy steel material. Assigned material for sleeper pad concrete and light weight concrete, track material is stainless steel. Finding which material is the best material for wheel, sleeper pad through static, modal and dynamic analysis by using different speeds and materials to analyze strength and dynamic characteristics of wheel axel of the locomotive. In this project take the best material for each part of rail wheel assembly and apply the assembly of rail wheel. Static and random analysis to determine the deformation, stress and strain. Dynamic analysis for observation of frequencies, mode shapes. Model analysis to determine the deformation with respect to frequency.

1.1 INTRODUCTION

A **train wheel** or **rail wheel** is a type of wheel specially designed for use on rail tracks. A rolling component is typically pressed onto an axle and mounted directly on a rail car or locomotive or indirectly on a bogie (UK), also called a truck (North America). Wheels are cast or forged and are heat-treated to have a specific hardness. New wheels are trued, using a lathe, to a specific profile before being pressed onto an axle. All wheel profiles need to be periodically monitored to ensure proper wheel-rail interface. Improperly trued wheels increase rolling resistance, reduce energy efficiency and may create unsafe operation. A railroad wheel typically consists of two main parts: the wheel itself, and the tire (or tire) around the outside. A rail tire is usually made from steel, and is typically heated and pressed onto the wheel, where it remains firmly as it shrinks and cools. Monobloc wheels do not have encircling tires, while resilient rail wheels have a resilient material, such as rubber, between the wheel and tire.

Characteristics required for wheels

Following are the characteristics required for wheels:

(1) Weight: Wheels are un sprang parts; therefore lightweight is preferable from the viewpoints of their influence over riding comfort and bogie parts. This characteristic is especially important when designing high-speed vehicles.

(2) Web fatigue strength: A web must have sufficient fatigue strength to withstand cyclic mechanical stress caused by the weight of the car body.

(3) Rolling contact fatigue strength of tread: Sufficient fatigue strength to withstand the rolling contact stress (Hertz stress) between the tread and rail is necessary.1)

(4) Characteristics of stress alternation caused by thermal attach: When a rim expands because of thermal input caused by tread braking, thermal stress is developed at the web and rim areas. Sometimes the excessive thermal input changes the normal stress distribution given by the production stage into an abnormal situation.

(5) Thermal crack and fracture resistance: This is the characteristic relating to thermal cracks initiated on a rim by the frictional heat generated by tread brake and their propagation. In worst case, wheel fracture takes place.

ANALYSIS OF NOISE REDUCTION IN ROTOR BLADE OF HELICOPTER USING DIFFERENT MATERIALS

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Abstract

A helicopter main rotor is the combination of several rotor wings and a control system that generates aerodynamic lift force that supports the weight of helicopter, and the thrust that counteracts aerodynamic drag in forward flight. In this project, the work basically deals with the modeling and analysis of the rotor blade of a helicopter for its strength. A rotor blade is complex 3D model geometry. This requires high end modeling CAD software is used for generating the blade model in CATIA V5 R20. This Project consists of brief details about Fiber Reinforced Plastic materials and the advantages of using composite rotor blade over the conventional metallic rotor blade. This project focus on the metal and composite strength analysis of the rotor blade. Determine the frequency of given rotor blades of helicopter using ANSYS software with modal, dynamic and harmonic analysis.

1. Introduction

Helicopter noise reduction is to research into designing helicopters which can be operated more quietly, reducing the public-relations problems with night-flying or expanding an airport. A helicopter main rotor or rotor system is the combination of several rotary wings (rotor blades) and a control system that generates the aerodynamic lift force that supports the weight of the helicopter, and the thrust that counteracts aerodynamic drag in forward flight. The helicopter rotor center is powered towards the engine, and the rotor blades connect to the center. The blade pitch is typically controlled by a swashplate connected to the helicopter flight controls. Each main rotor is mounted on a vertical mast over the top of the helicopter, as opposed to a helicopter tail rotor, which connects through a combination of drive shaft(s) and gearboxes along the tail boom.

In addition, it is useful for military application in which stealth is required: long-range propagation of helicopter noise can alert an enemy to an incoming

helicopter in time to re-orient defenses. The lift may be made towards the wings of the plane when they move through the air. There would four strengths acting on the helicopter, they are THRUST, DRAG, LIFT and WEIGHT. Each blade can swivel about a feathering hinge as it spins. Vertical pitch links push the blades up and down, making them swivel as they rotate.

HELICOPTER NOISE SOURCES:

Rotor Noise

The rotor generates different types of noise: Thickness noise is caused by the blade periodically displacing air during each revolution. This sound propagates in the plane of the rotor. Moreover, a rotating blade at non-zero angle of attack imposes rotating forces onto the surrounding air, causing blade loading noise. This sound generally propagates in a direction perpendicular to the plane of the rotor. Each main rotor blade also sheds a strong tip vortex whose trajectory travels downstream from the rotor in an approximately epicyclical manner. In descent conditions and sometimes at moderate speeds in level flight, the vortex trail may intersect the paths of subsequent blades. This event causes a blade-vortex interaction (BVI) impulsive noise sometimes referred to as "blade slap".

Engine Noise

Most engines are located above the aircraft, so noise is directed upward. Turbine engines are also less noisy than older types of helicopter engines. Most noise from helicopters is generated by the motion of the rotors.

Thickness Noise

Thickness noise is dependent only on the shape and motion of the blade, and can be thought of as being caused by the displacement of the air by the rotor blades. It is primarily directed in the plane of the rotor.

A STUDY OF FRP COMPOSITE PROPERTIES AND COMPARISON OF PROPERTIES TO ANALYZE FATIGUE STRENGTH AND FRACTURE

CH VIJAY KRISHNA RAO[1]   Dr S. SAMBHU PRASAD[2]   Mr N. RAGHUVEER[3]

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Abstract

Fiber reinforced polymer composite materials are gradually substituting traditional metallic materials because of their high specific strength and better corrosion resistance. However, the cost of the composites is still higher than the traditional materials. Different fibers are used in polymer matrix composites. Glass, Kevlar and carbon fiber are one of the promising reinforcements in polymer matrix composites.

In this paper, Glass, carbon and Kevlar fibers are popularly used in polymer composites for their improved properties and lower weight. The influence of stacking arrangement on mechanical properties of hybrid composite containing glass, carbon and Aramid fiber. Three hybrid composites of symmetrical pattern were created; i.e. [GCGC] [CACA] and [GAGA].

A composite plate is created using software CATIA and it is imported to ANSYS and properties of Aramid composites are added to it and constraints are applied after meshing it now on same material properties of normal composites are added and same process is repeated and comparison of results is done.

1.INTRODUCTION

A composite material is made by combining two or more dissimilar materials. They are combined in such a way that the resulting composite material or composite possesses superior properties which are not obtainable with a single constituent material. So, in technical terms, we can define composite as a multiphase material from a combination of materials, differing in composition or form, which remain bonded together, but retain their identities and properties, without going into any chemical reactions. The components do not dissolve or completely merge. They maintain an interface between each other and act in correct to provide improved, specific or synergistic characteristics not obtainable by any of the original components acting singly.

Glass: By blending quarry products (sand, kaolin, limestone and colemanite) at 1,6000C, liquid glass is formed. The liquid is passed through micro-fine bushings and simultaneously cooled to produce glass fiber filaments from 5-24gm in diameter. The filaments are drawn together into a strand (closely associated) or roving (loosely associated), and coated with a "size" to provide filament cohesion and protect the glass from abrasion.

Carbon: Carbon fiber is produced by the controlled oxidation, carbonization and graphitization of carbon- rich organic precursors which are already in fiber form. The most common precursor is polyacrylonitrile (PAN), because it gives the best carbon fiber properties, but fibers can also be made from pitch or cellulose. Variation of the graphitization process produces either high strength fibers (@~2,6000C) or high modulus fibers (@ ~3,0000c) with other types in between. Once formed, the carbon fiber has a surface treatment applied to improve matrix bonding and chemical sizing which serves to protect it during handling. Carbon fibers are usually grouped according to the modulus band in which their properties fall. These bands are commonly referred to as: high strength (HS), intermediate modulus (1M), high modulus (HM) and ultra-high modulus (UHM). The filament diameter of most types is about 5-7μm.

Aramid: Aramid fiber is a man-made organic polymer (an aromatic polyamide) produced by spinning a solid fiber from a liquid chemical blend. The bright golden yellow filaments produced can have a range of properties, but all have high strength and low density giving very high specific strength. All grades have good resistance to impact, and lower modulus grades are used extensively in ballistic applications. Compressive strength, however, is only similar to that of E glass. Although most commonly known under its Dupont trade name 'Kevlar', there are now a number of suppliers of the fiber, most notably Akzo Nobel with 'Twaron'. Each supplier

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Team

Studies Based on CFD Behaviour of Aerofoil and Regression Analysis

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Abstract

The performance of an aerofoil depends upon the angle of attack, leading-edge radius, surface modifications, etc. The aerofoil which has a broader range of attack angle and surface area is responsible for the upliftment in the performance of the aerofoil. The present work deals with the evaluation of the aerofoil spread with dimples over the active surface. The positions and area of spread are modified accordingly and evaluated for the velocity and pressure lineation. The aerofoil with 30% dimples over the active surface is found to possess higher values for the required intents of velocity and pressure at an inlet velocity of 9 m/s. The optimum model with better lineation values is further evaluated for the co-efficient of lift and drag to propose the best design. The best result is obtained at an aerofoil of NACA 8412 series with 30% dimples extension at the rear end placed at 15° angle of attack and the regression analysis is done for the coefficient of lift values.

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FLOW BEHAVIOR ON GROOVED PIPE WITH A CD – NOZZLE USING CFD

Authors

Venkatesh Gandhikota
Srikanth S
B S V Rama Rao

Abstract

A convergent nozzle that has a divergent path promotes a forced flow due to its throat. The CD-shaped protrusions along the internal surface of a pipe have been identified as potential obstacles to the flow of the pipe. The geometry of the pipe is provided with a fluid medium which passes through it. The generated model has been used to evaluate the inlet velocities and the lineation of the pipe. This software simulates the data collected during the experiments. The results of the tests are presented in terms of their correctness and applicability.

Key Words

Cite This Article

"FLOW BEHAVIOR ON GROOVED PIPE WITH A CD – NOZZLE USING CFD", International Journal of Emerging Technologies and Innovative Research (www.jetir.org), ISSN:2349-5162, Vol.8, Issue 9, page no.c556-c560, September-2021, Available :http://www.jetir.org/papers/JETIR2109274.pdf

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Cite This Article

"FLOW BEHAVIOR ON GROOVED PIPE WITH A CD – NOZZLE USING CFD", International Journal of Emerging Technologies and Innovative Research (www.jetir.org | UGC and issn Approved), ISSN:2349-5162, Vol.8, Issue 9, page no. ppc556-c560, September-2021, Available at : http://www.jetir.org/papers/JETIR2109274.pdf

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Electromagnetic and microwave absorption properties of MWCNTs based polymer nanocomposites

Satish Geeri, Aditya Kolakoti ▾

World Journal of Engineering
ISSN: 1708-5284 (International Standard Serial Number.)

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Abstract

Purpose

The purpose of the present work is to fabricate composite with strong absorbing nature and with more strength. The usage of wireless communication is increasing day by day, electromagnetic absorbing material is required to reduce this pollution. In the present experimental investigation, composites were fabricated for zero and 45° fiber orientation and as a filler material of Multiwall Carbon Nanotubes (MWCNTs) for the proposed percentage in the composites. Microwave absorbing properties were investigated for both perfect electric conductor (PEC)-backed composites and without PEC-backed composites.

Design/methodology/approach

The electromagnetic absorbing performance was analyzed based on complex permeability, complex permittivity, dielectric tangent and magnetic tangent losses. The experimentation was done by Vector Network Analyzer in the frequency range of 8.2 to 12.4 GHz by X-band. The surface morphological study was done. The mechanical and thermal properties are also investigated for these composites.

Findings

By investigating the experimental values, the induced percentage of MWCNTs and PEC of composites affects the electromagnetic and microwave absorption properties of the composites. The microwave absorption properties improved when the composites were able to absorb wide bandwidth and low reflection loss. The best results are obtained for PEC-backed composites for 5%, which is about −43.56 dB at 11.1 GHz compared to without PEC-backed composites. The reflection loss is developed by the dielectric loss initiated from

A REVIEW ON PERFORMANCE EVALUATION OF PELTON TURBINE

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Abstract:

Experimental methods have been used to measure fan performance. But the current generation often aims to measure using quantitative methods such as CFDs. The movement of a liquid liquid is an effective tool for measuring the performance of an electric generator. Pelton fan ship, a jet of water coming out of his nose was under air pressure. The performance of Pelton fans is highly dependent on the size, velocity, pressure of the aircraft and the size of the bucket. The current review paper mainly focuses on the use of literature for design improvement and CFD applications for the performance evaluation of Pelton fans.

Key words: *Pelton Turbine, CFD, Multi phase fluid flow, surface flow, etc.*

1. Introduction:

The Pelton Turbine is a tangent pulse turbine that uses a high-tech Pelton hydroelectric power plant located primarily in the region. The highest head, especially in mountainous areas. In bucket turbines, water is converted into kinetic energy through a nozzle at the end of the pressure line. The pressure is constant throughout the cycle and equal to atmospheric pressure, so that energy is transferred by the action of the excitation. The flow in the scale is unstable with an unknown free area, diverging from the two-phase flow of air and rising within the moving range. The performance of the Pelton turbine depends on several factors;

These turbines are bucket jet size, bucket water layer profile and bucket size, bucket water layer and bucket size.

Model tests were previously used to analyze the performance of a Pelton turbine for different bucket and nozzle sizes. But this analysis is time consuming and costly, and now that day-to-day progress has been made in CFD and numerical methods, optimizing the design of the Pelton turbine can be done in a short time frame. Turbine flow is a multiphase free surface flow consisting of air and water as the working medium.
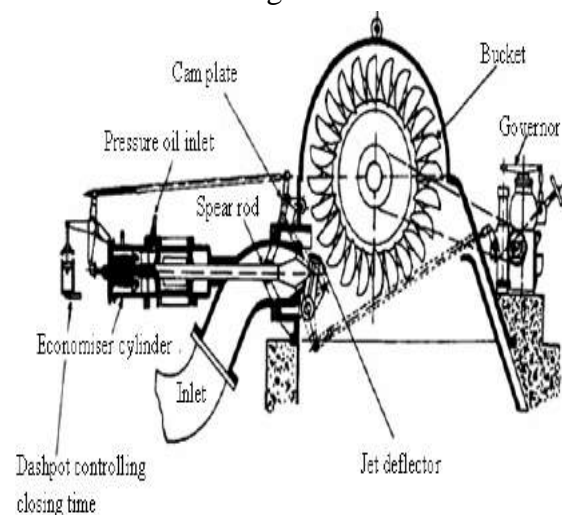
Fig. 1 Main Components of Pelton Turbine [1].

1.1 Literature Review:

BhattaraiSuyesh (2019) .et.al ... Mainly highlighted the main challenges associated with PELB turbine flow simulation.

Avinash Gudimetla[1]*, Dumpla Lingaraju[2], S. Sambhu Prasad[3]

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MODELLING AND OPTIMIZATION OF WEAR PARAMETERS OF Al 4032 REINFORCED WITH COAL ASH USING TAGUCHI AND RSM APPROACH

The present study aimed to analyze the wear behaviour of composites synthesized by reinforcing Al 4032 with 2, 4, 6 wt.% of coal ash using the stir casting technique. Wear testing was performed on the composites at room temperature in the absence of lubrication using a pin-on-disc tribometer considering the process parameters as wt.% of reinforcement, speed and load. Micro structural characterization using scanning electron microscope (SEM) and energy dispersive X-ray analysis (EDX) was performed on the cast composites to ascertain the existence of the reinforcement along with its distribution in the prepared composites. The Taguchi L_{16} orthogonal array was utilized to design experiments to study the significance of the process parameters on the wear rate. A mathematical model was developed for the wear rate using response surface methodology (RSM). 6 wt.% reinforcement, at the speed of 100 rpm and 10 N load were the obtained optimized parameters for the minimum wear rate. Surface plots as well as contour plots were analyzed to understand the consequence of the process parameters on the wear rate. The analysis of variance (ANOVA) revealed that speed with 76.10 % was the most prominent parameter followed by load and reinforcement with 11.23 and 9.42% respectively.

Keywords: coal ash, stir casting, mechanical properties, wear rate, Taguchi, RSM, ANOVA

INTRODUCTION

Enhancement of the mechanical properties along with better tribological characteristics can be obtained by tailor-made materials by reinforcing metal matrices with micro-sized particulates, which find applications in many verticals of engineering, industry, recreation and many more [1-3]. The research on aluminium is increasing because of its distinguished features of low cost, light weight and better mechanical properties [4-6] along with its ability to be cast with various types of reinforcement [7], which have made aluminium a promising material with high strength and stiffness in various structural applications. Few studies have been performed on Al 4032 [2, 8] and by considering its importance in the automobile industry and other fields [9], it was chosen as the matrix material in this study.

Different types of materials like particulates and fibers [7] are employed to reinforce aluminium in order to enhance its wear resistance along with its strength. Better tribological characteristics were obtained by reinforcing aluminium metal matrices with particulates when compared with unreinforced aluminium and its alloys [10]. Research on aluminium alloys was conducted by reinforcing them with various ceramic particles and better wear resistance was reported by researchers [11-17]. The uses of hybrid reinforcements have also shown a promising increase in mechanical and wear characteristics, because of the embodiment of hard reinforcements, which contributed to the increase in hardness of the composites [18].

A by-product from thermal power plants is coal ash, which was chosen as the reinforcement in the present study to investigate its effect on the wear characteristics of Al 4032. Some authors have reported the use of ash as reinforcement, which enhanced the hardness and mechanical properties of composites [19-21]. Reinforcing Al 4032 with coal ash reduces the problems associated with the disposal of industrial waste from thermal power plants, making the environment pollution free as well as fabrication of low-density composites at a low cost, with better mechanical and wear characteristics.

There are many methods for fabricating composites as reported by authors [22-32]. Stir casting is one of the low-cost techniques for fabricating composites with better distribution of the reinforcement, leading to better strength of composites. Hence, in this study, stir casting was used to fabricate composites with coal ash as reinforcement.

The design of experiments (DOE) is an abundantly used statistical tool to study the effect of process parameters on responses with a minimum number of

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Experimental Setup for Heat Transfer Analysis on Rectangular Plate by Natural Convection

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ABSTRACT
This paper represents the profiled activity accomplished by natural convection and it has the major broad application in the field of engineering and technology. In natural convection the fluid which surrounds the heat source receives heat radiations as its density decreases by temperature gradient as a result the air becomes less dense and forms its provisions for escape and the process continuously takes place for regular intervals, as the cold fluid is made readily available for heat contact and its geometric figure mainly depends on design, and analysis. Thermal analysis is done on the Rectangular flat plate materials used for the process is made of brass which is an alloy of copper and zinc as the brass is non- ferrous metal with excellent electrical and thermal conductivity as well as good corrosion resistance, ductility and strength the thermal conductivity of brass is 109 (w/mk) by which the brass has the excellent thermal conductivity and is a first choice for heat exchangers.
The design task of rectangular plate can be accomplished in Catia V5R21 software as it is being end up by making its geometrical model and the thermal behavior is studied in ansys 2020 R1 Academic software Fluent database. CFD analysis is to determine the pressure drop, velocity, heat transfer rate and mass flow rate for the rectangular plate. Thermal analysis is to determine the heat flux and temperature distribution along the rectangular plate. Its post processing gives out the study on contours of various parameters and its values. The charts are prepared by plotting the parameters values on Y axis against the X axis.
Keywords: Natural convection ,Ansys CFD, Thermal Analysis, Rectangular plate, Heat flux, etc..,

I. INTRODUCTION:

Natural convection is an appliance of heat transfer by which the fluid motion is caused by density differences in the fluid occurred by temperature gradients. Which results in mass movement of fluids, in natural convection, fluid surrounding a heat source receives heat, becomes less dense and rises up. The fluid or air surrounding the source surface moves to replace it. This cooler fluid gets heated and the process becomes unbroken, which results for formation of convection currents, this process transfers heat energy from the bottom of the convective cell to the top.

Natural convection has attracted a great deal of attention from researchers because of its presence both in nature and engineering applications.
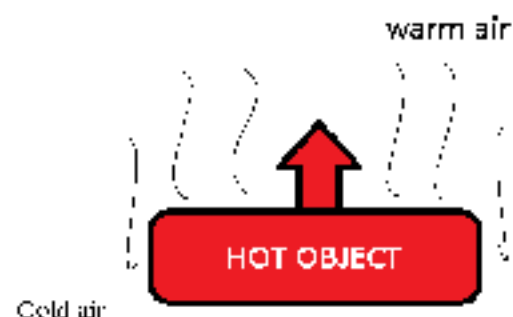
Fig 1: Natural convection heat transfer

In nature, convection cells formed from air raising above sunlight-warmed land or water are a major feature of all weather systems. Convection is also seen in the rising plume of hot air from fire, plate tectonics, oceanic currents (thermohaline circulation) and sea-wind formation (where upward convection is also modified by Coriolis forces). In engineering applications, convection is commonly visualized in the formation of microstructures during the cooling of molten metals, and fluid flows around shrouded heat- dissipation fins, and solar ponds.

Research Article | Published: 03 March 2021

Modelling and evaluation of combustion emission characteristics of COME biodiesel using RSM and ANN—a lead for pollution reduction

Ramachandran Thulasiram ✉, Santhosh Murugan, Dharmalingam Ramasamy & Surendarnath Sundaramoorthy

Abstract

Nowadays, the emissions from the diesel engines are focused lot to minimise the environmental pollutions in accordance with the emission standards. In this regard, biodiesels are found to be efficient for the diesel engines due to their higher energy contents and low exhaust emissions. Use of biofuel in association with diesel will be an efficient way for the cost-effective performance of the diesel engines with reduced pollutions. The COME is an efficient combustible oil, in which the diesel is blended at different proportions to identify their suitability in the diesel engines. In this regard, the properties of the COME-Diesel blends are determined and analysed for their influence on the combustion characteristics. To understand the performance and emission characteristics of blends, experiments are carried out on the variable compression ratio (VCR) engine keeping the blend, compression ratio, load, and speed as variables. The response surface methodology (RSM) used as a tool for designing and conducting the experiments according to the predetermined variables. The experimental sets generated are performed to determine the NO and HC emissions (response functions). The adequacy of the models is verified through ANOVA and through the p and F tests. The experimental design matrix is also used in training the artificial neural network (ANN) to develop the empirical models. The models from RSM and ANN are experimented and the results obtained from both the models are compared for their accuracy levels. Once the hypothesis is

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DESIGN AND FATIGUE ANALYSIS OF LEAF SPRINGS WITH DIFFERENT CROSS SECTION

June 2020

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Abstract and Figures

Suspension system is the important part in the wheeled vehicles; it provides a smooth flow in the vehicles by absorbing the sudden loads and impact about the uneven road surfaces. There are several types of suspensions. When it comes to heavy vehicles leaf springs are used for suspension. The main advantage of these is that they can handle more weight when compared to the other types. Generally these springs fails because of heavy loads and fatigue, fatigue is caused due to repeated fluctuation of loads. Several researches and analysis have been done in order to reduce this fatigue and new materials are also added to study the behaviour of leaf spring with respective to the application of loads. In this paper we are mainly focusing on how the leaf springs respond or vary with the change in the cross section on member. We have varied the leaf spring cross sections to trapezoidal, rectangular and capsule. The cross sections are varied is such a way that they don't increase the weight of the vehicle in order to obtain better output results. Calculations have been done, the leaf springs are designed and analysis is done by using CATIA v5. 1. Introduction Now a day's several heavy machinery trucks and load carrying have been introduced to the market, the main success of these vehicles lies in how much amount of load they are carrying and ability to resist against shock absorptions. The drivers used to handle these vehicles by adding more amounts of loads without following the specification given to then. During this process evolution of suspension systems and the components in it have been developed the major component of this suspension system is springs and these are also developed on according to the type of load. The springs are basically classified as compression and expansion springs. Compression springs: The springs which carry compressive loads are known as compression springs .These springs compresses during the application of load and they return to the original shape when the load is removed, generally these are in the form of helical shape and these have a wide number of applications in industrial equipment, electronic instruments, toys, pens etc., Extension springs:These are also known as tension springs and these are wrapped closely together to hold the tension as much as possible. These springs have a hook to hold or to pull the load from two sides of the spring at each end .These spring include applications like farm machinery, toys, door assemblies , hanging weights etc.,There several types' springs basing on their shape they are
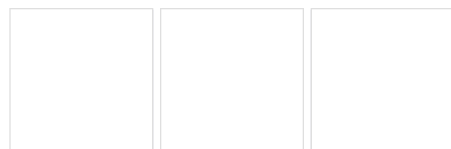
Rectangular Cross-section

CAD Model of Leaf Spring wit…

Stress in Rectangular…

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DESIGN AND FATIGUE ANALYSIS OF LEAF SPRINGS WITH DIFFERENT CROSS SECTION

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Abstract. Suspension system is the important part in the wheeled vehicles; it provides a smooth flow in the vehicles by absorbing the sudden loads and impact about the uneven road surfaces. There are several types of suspensions. When it comes to heavy vehicles leaf springs are used for suspension. The main advantage of these is that they can handle more weight when compared to the other types. Generally these springs fails because of heavy loads and fatigue, fatigue is caused due to repeated fluctuation of loads. Several researches and analysis have been done in order to reduce this fatigue and new materials are also added to study the behaviour of leaf spring with respective to the application of loads. In this paper we are mainly focusing on how the leaf springs respond or vary with the change in the cross section on member. We have varied the leaf spring cross sections to trapezoidal, rectangular and capsule. The cross sections are varied is such a way that they don't increase the weight of the vehicle in order to obtain better output results. Calculations have been done, the leaf springs are designed and analysis is done by using CATIA v5.

Keywords: Leaf Spring, Cross Sections, Fatigue,Frequency, Stability

1. Introduction

Now a day's several heavy machinery trucks and load carrying have been introduced to the market, the main success of these vehicles lies in how much amount of load they are carrying and ability to resist against shock absorptions. The drivers used to handle these vehicles by adding more amounts of loads without following the specification given to then. During this process evolution of suspension systems and the components in it have been developed the major component of this suspension system is springs and these are also developed on according to the type of load. The springs are basically classified as compression and expansion springs. Compression springs: The springs which carry compressive loads are known as compression springs .These springs compresses during the application of load and they return to the original shape when the load is removed, generally these are in the form of helical shape and these have a wide number of applications in industrial equipment, electronic instruments,

Flow behaviour on aerofoils using CFD

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Abstract. The aerofoils which allow for the flow at a broader range of angles have a more significant impact on the power generation from the turbine. The conception and examination for the aerofoil geometry have been executed in the current work to evaluate the behaviour of the flow in terms of the velocity and pressure lineation. The work is intended to focus on analysing the flow behaviour along the surface of the aerofoil geometry. The aerofoil geometries are opted to be of new aerofoil type of NACA 8412 series. The aerofoil geometry was analysed for a constant angle of attack along the total length. This evaluation was done for the angle of attack ranging from 0° to 20° with 5° interval for each model. The inlet velocity for the flow along the surface of the aerofoil geometry was taken varied from 7.5 m/s to 10 m/s with 0.5 m/s interval for each model. The plot points for the geometries are generated using the Auto CAD for different angles. The further simulations and evaluations were executed using the Ansys Fluent software. On evaluating and considering the variable conditions, the optimum values are obtained for the aerofoil at 15° angle of inclination at an inlet velocity of 9 m/s. The software generated results when compared to the regression data generated ascertained to be in a good correlation with each other.

Keywords: aerofoil, k-Epsilon energy equation, fluent software, auto CAD software.

1. Introduction

A steam turbine is an extended form of a heat engine which drives most of its performance from the thermodynamic efficiency from different stages of steam generation. The steam turbine blades are aerofoils which are light in weight, durable in nature, provide a better performance, efficient in working, and many other factors can be counted on [10]. The aerofoils move through the fluid and generate an aerodynamic force which provides a characteristic shape to work with more efficiency. The CFD analysis has provided the viability of simulating for the required contours regarding the flow behaviour. The CFD study over the aerofoils has been exaggerated rapidly with vast development. Naga babu et al. [1] carried out a CFD study for analysing the efficiency of the utility steam turbine, which involves the behaviour of the flow path in various components of the turbine. The overall efficiency of the turbine was increased by modifying the selected aerofoil properties. Sivakumar et al. [2] carried out a CFD study for analysing the efficiency of the utility steam turbine. The turbine geometries are analyzed for the parameters like temperature, pressure and power output. The obtained results have helped in predicting the turbine performance. Ali Raza Abid et al. [3] analyzed the turbine blades prepared from GE with twisted geometry along its length and applied with reverse engineering techniques. The blades were analyzed in under the wind tunnel conditions at lower velocities to reduce the vibrational and blade stall effects. On comparing the results, on comparing the results, variations have been identified as the ideal conditions cannot be maintained when it's done experimentally. Sivakumar et al. [4] carried out the CFD study of turbine blades. In this, the study was conducted on a typical intermediate pressure cylinder. On evaluation and comparison among the CFD results and 2D

System Designing on Smart Operation for Predictive Maintenance

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Abstract
In present scenario a significant amount of the global GDP is being diverted towards maintenance, more commonly for acknowledging breakdown or equipment failure. Behavior of operation with favorable safety satisfied industrial basic expectations, fulfilling industrial devices are in the range of its maximum potential of usefulness. The technology as M2M communication, Modern sensor technologies, associated with latest information technologies principle are more helpful on minimizing unused potential of equipment by providing real-time data on performance levels. On availability of such these input data a proper maintenance schedule can be developed to maintain the right parts with the right means without losing equipment efficiency. Hence predictive maintenance has a great role on industrial safety and smooth operation. This research article express the proper analyze of predictive maintenance features, as condition monitoring &, fault diagnosis. Here some of the possible technology associated to predictive maintenance is considered and finally a suitable solution is given for better and early maintenance process.

The objective of this research work is to analyze previous information so as to develop a system that would provide an alert message on the event of any unusual behavior of machines so that the maintenance can be done in advance through surveillance of the situation, information analysis.

Keywords— Smart system, predictive maintenance, fault tracking sensor and signal failure.

I. Introduction

Present technology has basically three different successive steps of maintenance depending on complexity and necessity of outcome. They are mostly corrective, preventive and predictive in nature. Identifying, isolating and rectifying the traditional fault come under corrective maintenance of a system or machine so that it can be ready for operational condition. Preventive maintenance is a regular operation of any industry to keep the machines healthy and to run the industry continuously without any interruption. It is performed while the equipment is in working condition to avoid any kind of unexpected break down and reduce major repairs. The disadvantages of the above two conventional methods is it lowers the reliability of the equipment and increase the maintenance cost. The disadvantages of the above two methods and increases efficiency and reliability predictive maintenance is mostly purposeful.

Predictive maintenance is described as a method used to predict when a machine fails and when it is necessary to do maintenance to avoid failure. It also helps to plan maintenance schedule well in advance to minimize the maintenance frequency of machines and increase its life span and also preventing the maintenance expenses. Different techniques can be used for predictive maintenance and based on expert opinion and types of device, the proper technique is used.
Using the outcomes of this method we can easily replace or maintain the unusual part so that it can work efficiently. The system condition is predicted based on the condition

Optimization of CNC Lathe Machining Parameters by Using Taguchi Method.

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Abstract- *This paper is about the Optimization of CNC lathe Machining Parameters such as Speed, Feed, Depth of Cut, by using TAGUCHIMethod to improve the quality of manufactured product. TAGUCHI orthogonal array is generated with the three levels of turning parameters by using MINITAB 19 software. In this Study, The Material Removal Rate, Tool Wear Rate is taken as the quality characteristic output with the concept of Larger The Better and Smaller The Better respectively. TAGUCHI method gives the importance of analyzing the response variation using the Signalto Noise Ratio or (S/N) Ratio. The signal to noise ratio for the larger the better for MRR and smaller the better for TWR. The signal to noise ratio values are calculated by taking consideration by using the software MINITAB19. The M.R.R, TWR values are measured from the analysis and their optimum value for maximum removal rate also measured. Aluminium is used as the work piece material for experimentation to optimize the M.R.R. and T.W.R. ANOVA(Analysis of Variance) was employed along with Signal To Noise Ratios to determine the optimum values for MRR and TWR.*

Keywords- *Step Turning, Machining Parameters, Signal To Noise Ratios, ANOVA, MINITAB19.*

I. INTRODUCTION

Step Turning process is the Removal of Material from the outer diameter of a rotating cylindrical work piece by means of single point cutting tool which is held stationary on the tool post and moved parallel to the work piece axis with suitable Speed, Feed and Depth of Cut, Step Turning is used to produce cylindrical surface on the work piece. Step Turning is carried out on lathe that provides the power to turn the work piece at a given speed and to feed the cutting tool at specified rate and depth of cut. Therefore, three cutting parameters or input parameters namely cutting speed, feed, and depth of cut need to be determined in a turning operation.

1.1 Computer Numerical Control lathe machine

A Computer numerical control (CNC) machine is mostly preferred to meet the complex designs like curved geometries in 2-Dimensional and 3-Dimensional which are very expensive to be done by conventional machines. These CNC machines can make sound machining components with high repeat-ability and precision. We can easily operate the CNC machine with less work force and these plays a key role in improved production planning and also increases productivity. We can get almost close tolerance which we desired by using the CNC machine. Actually, conventional machine has 2 axes only x-axis and y-axis. there is z-axis also but only the bed moves vertically. But in CNC machine x, y, z-axis is there with spindle moving parallel to z-axis.

CNC machines have rigid construction when compared with the conventional one. The slide ways, guide and spindles of the CNC machine all look over proportioned when compared to the conventional one. The structure of the CNC machine is therefore designed to cope with the torsional forces and heavy duty cutting imposed on these machines. In CNC rolling friction is used instead of sliding one, this implies in longer life, less frictional resistance, more precise position of slides, and lower torque required. A computer numerical control (CNC) lathe machine processes a work piece to meet the specifications by following a coded programmed instruction and without a manual operator. A series of coded instructions are given to a CNC machine in the form of a sequential programme of machine control instructions such as G-code and M- code etc. The programme can be written by a person manually or, computer– aided design software. The machine control unit (MCU) is the heart of the CNC machine which controls the whole operations performed by the CNC machine. It reads the code and decodes the coded instructions, implements the interpolations like linear, circular, helical to generate axis motion commands. It also feeds the axis motion commands to the amplifier circuits for driving the axis mechanisms. There are two types of systems are there, open loop and closed loop. In which open loop operates manually and closed loop contains feedback system which is referred as the measuring system. The MCU uses the difference between the reference signals (source signals) and feedback signals to generate the control signals for correcting position and speed errors.

OPTIMIZATION OF PROCESS PARAMETERS OF AWJM ON AA6061-7.5% SiC MMC FOR LOWER SURFACE ROUGHNESS AND HIGHER MRR

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Abstract - **Metal matrix composites (MMCs) have evoked a keen interest in recent times for potential applications in aerospace and automotive industries. Hardness and strength are the prime requirements of MMCs used in structural applications. In general, these properties are exhibited by Al-SiC MMCs. But major restraints are material cost, heterogeneous distribution of reinforcement in matrix during manufacturing and inaccurate dimensions of final product after machining. Subduing the limitations, an attempt has been made to fabricate AA6061-7.5%SiC using two step stir casting method and machine it using Abrasive Water Jet Machining (AWJM) technique. The present investigation targets to optimize the AWJM process parameters while machining AA6061-7.5%SiC MMC. The variable process parameters of AWJM are considered as abrasive feed, stand-off distance and traverse speed. Using the L9 orthogonal array by Taguchi method for design of experiments and analysis, the liaison between these parameters and their responses is explored by ANOVA and Response Surface Methodology (RSM). The results are developed in accordance to a quality control factor and a machinability factor which are surface roughness (SR) and material removal rate (MRR) respectively. Optimal parameters are obtained with respect to lower SR and higher MRR.**

Keywords **- Abrasive Water Jet Machining (AWJM), Metal Matrix Composite (MMC), Taguchi method, ANOVA, Response Surface Methodology (RSM), Two step stir casting, Traverse speed, Abrasive feed, Stand-off distance, Hardness, Strength, Material Removal Rate (MRR), Surface Roughness (SR).**

I. INTRODUCTION

Aluminium alloys are very promising for structural applications in aerospace, military and transportation industries due to their light weight, high strength-to-weight ratio and excellent resistance to corrosion [Dharmpal Deepak et al. (2013)]. AA6061 is a wrought heat treatable aluminium alloy. It has Mg & Si as major constituent elements. It is widely used in construction of aircraft and marine (ship building) structures. It has commendable corrosion resistance, workability, machinability, weldability and brazability but medium strength and low hardness. In marine applications, surface transport like yachts are completely manufactured using AA6061. Yachts need high strength to balance various forces acting on

MODELING AND FE ANALYSIS OF FUNCTIONALLY GRADED (FG) COMPOSITE SHELL STRUCTURES

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ABSTRACT

In this paper involves with the finite element modeling and analysis of functionally graded (FG) shell structures under different loading such as thermal and mechanical. Free vibration analysis of functionally graded (FG) spherical shell structure has also been presented. In order to study the influences of important parameters on the responses of FG shell structures, different types of shells have been considered. The responses obtained for FG shells are compared with the homogeneous shells of pure ceramic (Al2O3) and pure metal (EN 31 steel) shells and it has been observed that the responses of the FGM shells are in between the responses of the homogeneous shells. Furthermore, static analysis done on FG shell structure is to determine the circumferential and longitudinal stress, strain and deformation. Furthermore modal analysis is to be determining the natural frequencies.

Keywords: EN 31 steel alloys, Al2O3, FG,ceramic, CATIA and ANSYS

INTRODUCTION

Various fields of engineering such as civil, mechanical, aerospace and nuclear engineering fields the thin walled cylindrical shells finds wider applications as primary structural members. The stiffened and un stiffened shells made up of metallic and laminated composite materials (large diameter to thickness ratio) are extensively used in underwater, surface, air and space vehicles as well as in construction of pressure vessels, storage vessels, storage bins and liquid storage tanks. The geometric imperfections due to manufacturing processes takes dominant role in decreasing the buckling load of cylindrical shells. Buckling is often viewed as the controlling failure mode of these structures due to its relatively small thickness of these structural members. It is therefore essential that the buckling strength of the thin shells along with knowledge of its buckling has been the subject of many researchers in both analytical and experimental investigations.

Composite structures are important in different areas of industry such as aero, marine aircrafts, ships, automotive and so on. Many of the structures experience blast

DESIGN AND COMPARISON ANALYSIS OF CHAIN DRIVE WITH DIFFERENT MATERIALS

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Abstract

This paper involves the fundamentals of chain drive modeling through reverse engineering approach. In this examination chain drive is broke down utilizing finite element analysis for wellbeing and dependability. A cad model of chain drive is designed in CATIA V5 part module. Pre-processing and post-processing operations are done in ANSYS workbench.

In this project, we applied material properties of AISI 1050 steel, EN 8 steel, EN 32 steel, EN 19 steel and C45 steel at different vehicle speeds(40,60 and 80 km/hr) values for Von-Missies, total deformation, equivalent strains and stresses has been compared.

Keywords: steel alloys, speed, CATIA and ANSYS

1.INTRODUCTION

Chain drive is a way of transmitting mechanical power from one place to another. It is often used to convey power to the wheels of a vehicle, particularly bicycles and motorcycles. It is also used in a wide variety of machines besides vehicles.

Most often, the power is conveyed by a roller chain, known as the drive chain or transmission chain, passing over a sprocket gear, with the teeth of the gear meshing with the holes in the links of the chain. The gear is turned, and this pulls the chain putting mechanical force into the system. Another type of drive chain is the Morse chain, invented by the Morse Chain Company of Ithaca, New York, United States. This has inverted teeth.

Fig: chain sprocket

Materials Used

A chain sprocket can be made of different materials based on required strength and service conditions. In this an examination is established on materials of iron family element, an alloy and a carbon element. This gives a better choice of chain sprocket based on application. As materials reduce in weight, noise and cost will improve efficiency of chain sprocket

AISI 1050 STEEL

Carbon steels contain carbon as the main alloying element. They are designated by AISI four-digit numbers, and contain 0.4% of silicon and 1.2% of manganese. Molybdenum, chromium, nickel, copper, and aluminum are present in small quantities.

EN 8 STEEL

EN8 steel material is suitable for the all general engineering applications requiring a higher strength than mild steel such as:

•   General-purpose axles

CFD AND THERMAL ANALYSIS OF SOLAR COLLECTORS BY USING FEA TECHNIQUE

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Abstract
Solar thermal energy collector can be described as an energy balance between the solar energy absorbed by the collector and the thermal energy removed or lost from the collector. If no alternative mechanism is provided for removal of thermal energy, the collector receiver heat loss must equal the absorbed solar Energy.
In this project, focus on thermal and CFD analysis with different fluid air, water and different solar collector's i.e flat plate and parabolic trough was modeled by using CATIA design software. Thermal analysis has done one the solar collectors with different materials (aluminum & copper). These values are taken from CFD analysis.
Furthermore, CFD analysis to determine the heat transfer coefficient, heat transfer rate, mass flow rate, pressure drop and thermal analysis to determine the temperature distribution, heat flux with different materials.

INTRODUCTION

A solar thermal collector collects heat by absorbing sunlight. The term "solar collector" commonly refers to a device for solar hot water heating, but may refer to large power generating installations such as solar parabolic troughs and solar towers or non water heating devices such as solar air heaters.

Solar thermal collectors are either non-concentrating or concentrating. In non-concentrating collectors, the aperture area (i.e., the area that receives the solar radiation) is roughly the same as the absorber area (i.e., the area absorbing the radiation). This type has no extra parts except the collector itself.

Concentrating collectors have a much bigger aperture than absorber area (additional mirrors focus sunlight on the absorber) and only harvest the direct component of sunlight.

Non-concentrating collectors are typically used in residential and commercial buildings for space heating, while concentrating collectors in concentrated solar power plants generate electricity by heating a heat-transfer fluid to drive a turbine connected to an electrical generator.

Flat plate collectors

Flat-plate collectors are the most common solar thermal technology in Europe.[6] They consist of an (1) enclosure containing (2) a dark colored absorber plate with fluid circulation passageways, and (3) a transparent cover to allow transmission of solar energy into the enclosure. The sides and back of the enclosure are typically insulated to reduce heat loss to the ambient. A heat transfer fluid is circulated through the absorber's fluid passageways to remove heat from the solar collector.

Parabolic trough

This type of collector is generally used in solar power plants. A trough-shaped parabolic reflector is used to concentrate sunlight on an insulated tube (Dewar tube) or heat pipe, placed at the focal point, containing coolant which transfers heat from the collectors to the boilers in the power station.

Research Article

Heat Swapping Analysis For A Finned Heat Pipe Using CFD

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Abstract : The present study is carried out on a concentric heat pipe by intriguing the geometries of the pipe considered. The fin configurations are placed about the circumference of the tube in 2D manner. The numerical and simulation analysis are evaluated for the geometry using the computational dynamics tool. The main grail of the work is to increase the heat swapping behavior by modifying the geometry thereby increasing the effectiveness of the pipe. The geometries are evaluated in terms of velocity, pressure and temperature lineation in order to calculate for the heat swapping behavior. The results depicted that the maximum amount of heat swapping can be observed in model – M3. The outlet values with regard to the temperature lineation are found to be in considerable correlation with the regression data generated.

Keywords : Fins, Heat pipe, Lineation, Heat Swapping, Fin extensions

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Research Article

Heat Swapping Analysis for a Finned Heat Pipe Using CF...

Chada Jithendra Sai Raja[1], Akhil Yuvaraj Manda[2], Nikhil Vurakraanam[3], Venka...

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*Corresponding author: Chada Jithendra Sai Raja., E-mail: csai0799@g...

ABSTRACT

The present study is carried out on a concentric heat pipe by intriguing the geometries ... are placed about the circumference of the tube in 2D manner. The numerical and simu... using the computational dynamics tool. The main grail of the work is to increase t... geometry thereby increasing the effectiveness of the pipe. The geometries are e... temperature lineation in order to calculate for the heat swapping behavior. The resul... swapping can be observed in model – M3. The outlet values with regard to the temper... correlation with the regression data generated.

Keywords: *Fins, Heat pipe, Lineation, Heat Swapping*

INTRODUCTION

Heat exchangers are the equipment used to transport the fluid from high temperature to lower temperature without direct contact. They are found in every industry as the key component for the transportation of the fluid without loss in terms of the volume thereby increasing the heat transfer rate between the considered geometry and the fluid. The operational principle for the conception and evaluation of the geometry is to determine the sensitivity of the heat swapping behavior and between the considered fluid and the surface of the pipe.

Stephenraj. V et al.[1] have studied the flow in plain tube, angular tube, stepped tube & combined angular and stepped tube. Among the combined angular and stepped tube has shown the maximum temperature difference between inlet and outlet. Heidar Sadeghzadeh et al.[2] have studied the heat transfer rate in a finned shell and tube type heat exchanger and concluded that the fins on the walls of the tube increases the heat transfer rate. L. Prabhu et al.[3] designed and analyzed the heat transfer through Straight fin with uniform cross sections, Straight fin with non-uniform cross sections, Annular fin and Pin fin with non-uniform cross section. Among, the heat transfer from a rectangular configuration fin is higher when compared to other configurations. Pardeep Singh et al.[4] designed and analyzed the heat transfer through fins with rectangular, trapezium, circular and triangular extensions. The fins with extensions enhances the heat transfer by 5% to 13% when compared to the plain fins. Among the extensions, Rectangular extensions gives highest heat transfer rate. Chirag Maradiya et al.[5] conducted experimental investigation on conical tube heat exchanger. The heat transfer rate and overall heat transfer increases with decrease in diameter ratio of a conical tube. Mehran Ahmadi et al.[6] studied the flow in heat sinks with interruptions. The rectangular extensions increase the heat transfer rate by interrupting the thermal and hydrodynamic boundary layers. Hamed Sadighi Dizaji et al.[7] have studied the heat transfer from a corrugated tube. The convex corrugation tube has given the best results compared to concave corrugated tube.

evaluate an appr... amount of heat b...

PROCEDURE

A 2 – Dimensio... designed in a cr... 600mm with d... 140mm and 120... diameter is a re... 28mm at the end... indicated in the t...

Table. 1...

Model Name
M2
M2
M3
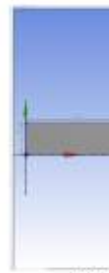
Fig 1...

Reviewer Comments : #Reviewer 1

The paper title is very okay. The methodology correlates with the work displayed in the paper. Concluding sentences are very good. Recommendations are good enough.

Recommendation: The paper is hereby strongly

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Engine-bracket drilling fixture layout optimization for minimizing the workpiece deformation

Ramachandran T., Surendarnath S., Dharmalingam R. ▾

Abstract

Purpose

Fixture layout design is concerned with immobilization of the workpiece (engine mount bracket) during machining such that the workpiece elastic deformation is reduced. The fixture holds the workpiece through the positioning of fixturing elements that causes the workpiece elastic deformation, in turn, leads to the form and dimensional errors and increased machining cost. The fixture layout has the major impact on the machining accuracy and is the function of the fixturing position. The position of the fixturing elements, key aspects, needed to be optimized to reduce the workpiece elastic deformation. The purpose of this study is to evaluate the optimized fixture layout for the machining of the engine mount bracket.

Design Methodology Approach

In this research work, using the finite element method (FEM), a model is developed in the MATLAB for the fixture-workpiece system so that the workpiece elastic deformation is determined. The artificial neural network (ANN) is used to develop an empirical model. The results of deformation obtained for different fixture layouts from FEM are used to train the ANN and finally the empirical model is developed. The model capable of predicting the deformation is embedded to the evolutionary optimization techniques, capable of finding local and global optima, to optimize the fixture layouts and to find the robust one.

Findings

For efficient optimization of the fixture layout parameters to obtain the least possible deformation, ant colony algorithm (ACA) and artificial bee colony algorithm (ABCA) are used and the results of deformation obtained from both the optimization techniques are compared for the best results.

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Structural and suitability analysis of aluminium metal matrix composites for IC engine mountings

T. Ramachandran [a] ⊠, S. Surendarnath [b], R. Dharmalingam [c]

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Abstract

IC engine produces vibration during the operation, which reduce the life and reliability of both the engine and the chassis and hence loss of comfortability in riding. Mounts should have the ability to damp out the vibrations at the various load speed conditions. Elastomeric rubbers are used to damp put the vibration and they are manufactured by Materials like cast iron and steel are integrated with elastomeric rubbers to provide the structural stability. To some extent the steel/cast iron based mounts are able to isolate the engine vibrations. A search for materials with good damping and stiffness combined with rubber is needed for the engine mounts. In this research article, the steel plates are replaced by Al6061-Sic and Al6061-Al_2O_3 Metal Matrix composites (MMC) and studies are carried out on the engine mounts made of Al6061-Sic and Al6061-Al_2O_3 MMC plates integrated with rubber. The vibration characteristics of both the mounts are determined experimentally and compared with steel for better vibration isolation.

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Study on Conceptual Design and Shape Optimization of Pintle Nozzle of a Rocket

Jithendra Sai Raja Chada*, Priya Chandini Ragu **, A. Phani Bhaskar ***

*-*** Department of Mechanical Engineering, Pragati Engineering College, Kakinada, Andhra Pradesh, India.

Abstract

The nozzle is employed to accelerate and expand or compress the fluid flow. It is generally used to control the rate of flow, velocity, and pressure. The shape of the nozzle also pla
nozzle is a tool that directs or modifies the entering fluid which may be a gas or a liquid and rises its velocity. A nozzle can be a channel or canal or tube or a pipe that helps in modif
fluid. We have convergent and divergent or both convergent-divergent types of nozzles. Also the varying cross-sections of the area of the nozzles affect the speed of the fluid. Th
nozzle is reduced, the rate of nozzle fluid raises and in the same way as the area of the nozzle is raised or increased, then the rate of nozzle fluid is reduced. This paper focuses on t
the application of the nozzles for different shape of pintle to increase the performance of propulsion.

Keywords

Nozzle, Shape Optimization, Lineations, Propulsion.

How To Cite This Article?

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CFD ANALYSIS OF Fe_3O_4 NANOFLUID FLOW IN AN ELLIPTICAL TUBE INSIDE A CIRCULAR TUBE WITH INSERTS

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Abstract—**There is a continued research to increase heat transfer rates in many engineering applications. Particularly at moderate Reynolds numbers in pipe flow the augmentation methods are divided into two types viz., passive techniques and active techniques. Placing different types of inserts in tubes serve as passive techniques. Active techniques, in which external power input is used, such as power work, are less preferred. The main aim of this thesis is to analyze the heat transfer in turbulent flow to horizontal tube using different types of inserts. The Reynolds number at 12000 and two different fluids are used such as water and water 95%+ Fe3O4- 5%. Furthermore, the three different types of inserts used. 1) Twisted tape 2) Perforated Twisted Tape3) Double Counter Twisted Tape .The data from ANSYS is used to calculate Friction factor and Nusselt number in the presence of inserts 3D models of the horizontal tube with inserts is done in Pro/Engineer and analysis is done in ANSYS. Using nano fluid further improved heat transfer.**

Keywords⸺ **Nanofluid, Return Bend, Wire Coil Inserts, CFD, Heat Transfer**

I. INTRODUCTION

Turbulent heat transfer and pressure drop in a horizontal tubes with strip-type inserts experimentally done to get heat transfer enhancement for 6500⩽Re⩽19500. [1]. Techniques (passive and active) have been discussed to enhance compound heat transfer enhancement amng them using inserts is one of the goo idea[2]. The heat transfer characteristics and the pressure drop in the horizontal double pipes with twisted tape insert are investigated. The majority of the data falls within ±15%, ±10% of the proposed correlations for heat transfer coefficient and friction factor, respectively [3]. Experimental investigation of heat transfer and friction factor characteristics in a double pipe heat exchanger fitted with regularly spaced twisted tape elements, were studied. The inner and outer diameters of the inner tube are 50.6 and 25.8 mm, respectively and cold and hot water were used as working fluids in shell side and tube side [4]. An extensive experimental study on three wire coils of different pitch inserted in a smooth tube in laminar and transition regimes. Isothermal pressure drop tests and heat transfer experiments under uniform heat flux conditions have been carried out. The friction factor increases lie between 5% and 40% in the fully laminar region [5]. The thermohydraulic performance of turbulent flow of air through rectangular and square ribbed ducts with twisted-tape inserts has been experimentally studied. The short-length twisted-tape performance is worse than the full-length twisted tapes [6]. Nanofluids, i.e., well-dispersed (metallic) nanoparticles at low- volume fractions in liquids, may enhance the mixture's thermal conductivity, knf, over the base-fluid values. New theories as well as useful correlations have been reviewed [7]. Flow friction and heat transfer behavior in a twisted tape swirl generator inserted tube are investigated experimentally. The twisted tapes are inserted separately from the tube wall. The effects of twist ratios (y/D=2, 2.5, 3, 3.5 and 4) and clearance ratios (c/D=0.0178 and 0.0357) are discussed in the range of Reynolds number from 5132 to 24,989, and the typical one (c/D=0) is also tested for comparison. Consequently, the experimental results present that the best operating regime of all investigated twisted tape swirl generator inserts is detected at low Reynolds number, leading to more compact heat exchanger. The empirical correlations based on the experimental results of the present study are also given for prediction the heat transfer (Nu), friction factor (f) and heat transfer enhancement (ζ) [8]. The heat transfer performance and friction factor characteristics in a circular tube fitted with twisted wire brush inserts were investigated experimentally. Heat transfer and friction factor data in tubes were examined for Reynolds number ranging from 7,200 to 50,200. The results indicated that the presence of twisted wire brush inserts led to a large effect on the enhancement of heat transfer with corresponding increase in friction factor over the plain tube. Finally, correlations were developed based on the data generated from this work to predict the heat transfer, friction factor, and thermal performance factor for turbulent flow through a circular tube fitted with the twisted wire brush inserts in terms of wire density (y), Reynolds number (Re), and Prandtl number (Pr) [9]. The Experimental investigation of heat transfer and friction factor characteristics of horizontal circular pipe using internal threads of pitch 100mm, 120mm and 160mm with air as the working fluid. The transitional flow regime is selected for this study with the Reynolds number range 7,000 to 14,000. The heat transfer coefficient enhancement for internal threads is higher than that for plain pipe for a given Reynolds number. The use of internal threads improved the performance of horizontal circular pipe. Keywords - Enhancement, internal threads, heat transfer and turbulent flow. Angirasa performed experiments that proved augmentation of heat transfer by using metallic fibrous materials with two different porosities namely 97% and 93%. The experiments were carried out for different Reynolds numbers (17,000-29,000) and power inputs (3.7 and 9.2 W). The improvement in the average Nusselt number was about 3-6 times in comparison with the case when no porous material was used. Fu et al. experimentally demonstrated that a channel filled with high conductivity porous material subjected to oscillating flow is a new and effective method of cooling electronic devices. The experimental investigations of Hsieh and Liu

Design, Fabrication and Testing of 3D Printing Models of Flexure Mechanism

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Abstract

Flexure Mechanism is a recent development in the field of MEMS designing. It is a single-piece mechanism that transfers motion without any relative motion between joints or linkages, thus causing no friction or hysteresis loss. The design of a mechanism having flexural bending at the linkages methods for modelling and designing compliant mechanisms has spurred their use in a variety of products, ranging from macro-scale products such as clutches, guides, and switches, to micro-electromechanical systems. This mechanisms offer a number of advantages, such as increased precision, reduced friction and wear, simple construction, and reduced assembly. In many ways this mechanisms have developed. Similar functionality to rigid mechanisms. Compliant mechanisms have the potential to completely eliminate relative motion between linkages, and thus eliminate friction

In this work a flexural mechanism are designed using data from the base paper and manufactured using 3D printing and are tested for flexibility, the flexibility is measured in terms of deformation under load and using a graph sheet setup, for fabricate the mechanism poly-lactic acid material is used, and is fabricated on a 3D printer, these models are developed using Catia v5. The results are validated using Ansys simulation results.

Keywords— *Flexure mechanism, Pseudo-rigid body models, Polylactic acid material, 3d printing, cura soft ware, catia v5, Ansys.*

1. Introduction

A mechanism is a mechanical device used to transfer or transform motion, force, or energy. Traditional rigid-body mechanisms consist of rigid links connected at movable joints. Two examples are shown below. The linear input is transformed to an output rotation, and the input force is transformed to an output torque. As another example, consider the vice grips shown in the right image. This mechanism transfers energy from the input to the output the gripper teeth. Since energy is conserved between the input and output , the output force may be much larger than the input force, but the output displacement is much smaller than the input displacement. Structures may also consist of rigid links connected at joints, but relative motion is not allowed between the links. Since a structure does not have mobility, it does not perform work, and is usually not considered to be a mechanism.Mechanisms are all around us. There are many examples in automobiles, sports equipment, furniture, construction equipment, robotics, and almost anything that has moving parts.
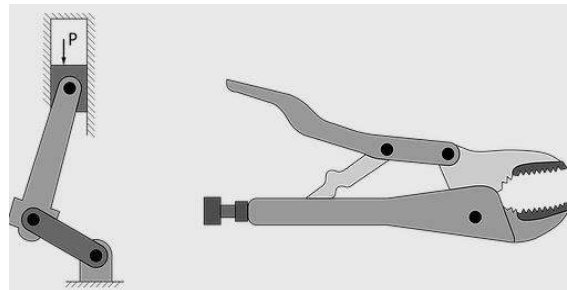

Figure 1(a) Vice grips

1.1 Flexure mechanism

A flexure mechanism is a mechanism that gains at least some of its mobility from the deflection of flexible members rather than from movable joints only. An example or a compliant crimping mechanism is shown below. For the compliant crimping mechanism shown below, the input force is transferred to the output port, much like the

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Determination of Input Set through Multi-Objective Optimization of PMEDM Output Parameters using Modified Topsis

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Abstract

Input parameters identification and selection along with its range is an important task to proceed with the major experimentation in research work, especially when working with (Design of Experiment). Few parameters have to be considered with fixed values and as variables based on the limitations or ranges of the input parameter values in non-co Selection of the range of values is the immediate task after selecting input parameters. There should be one procedure or evidence for selecting the better range of values in literature. In this research paper, the selection of range of values of 'Pulse ON Time' is discussed. Out of the four proposed input parameters to be used in the main experimentatio and seventeen experiments were conducted to determine the range for the fourth parameter. For different values of input parameters, MRR and SR were found. Modified TOPS observations, and then from the results, better values of T_{on} were found out to complete set of values which are to be utilized in DOE.

Keywords

Electric Discharge Machining, Material Removal Rate, Modified TOPSIS, Relative Closeness, Surface Roughness, Pulse ON Time.

How To Cite This Article?

Ramarao, B. S. V. (2020). Determination of Input Set through Multi-Objective Optimization of PMEDM Output Parameters using Modified Topsis. *i-manager's Journal on Material Scien* https://doi.org/10.26634/jms.8.3.17672 (https://doi.org/10.26634/jms.8.3.17672)

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Biodiesel production from low-grade oil using heterogeneous catalyst: an optimisation and ANN modelling

Aditya Kolakoti ✉ 🆔 & G Satish

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THERMAL ANALYSIS ON GLASS-FIBER REINFORCED POLYMER COMPOSITE REBARS

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Abstract:

Fiber-reinforced polymer (FRP) composites have become basic Materials for keeping up and fortifying existing infrastructures. Numerous new imaginative kinds of hybrid material and structural systems have been created by utilizing the FRP composite materials, the expanded use of these materials necessitates that primary architects and professionals have the option to comprehend the conduct of FRP materials and plan for the composite structures. Materials like carbon, aramid, glass, and basalt were generally used synthetic fiber reinforced polymers in the structures of civil engineering. The major objective of this project is to study the thermal analysis on rebars that was used in reinforced concrete structures and a comparison was made between the applied GFRP material on rebars composite, with the steel and concrete materials. During the temperatures ranging from 22°C to 500 °C, fluctuations in weight was also recorded and along with visual estimation of GFRP specimen at 200 °C was also been stated.

Key words: GFRP, Rebars, Thermal Analysis

INTRODUCTION

Rebar (short for **reinforcing bar**), known when massed as **reinforcing steel** or **reinforcement steel**, is a steel bar or mesh of steel wires used as a tension device in reinforced concrete and reinforced masonry structures to strengthen and aid the concrete under tension. Concrete is strong under compression, but has weak tensile strength. Rebar significantly increases the tensile strength of the structure. Rebar's surface is often "deformed" with ribs, lugs or indentations to promote a better bond with the concrete and reduce the risk of slippage.

The most common type of rebar is carbon steel, typically consisting of hot-rolled round bars with deformation patterns. Other readily available types include stainless steel, and composite bars made of glass fiber, carbon fiber, or basalt fiber. The steel reinforcing bars may also be coated in an epoxy resin designed to resist the effects of corrosion mostly in saltwater

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Influence of RHA reinforcements on mechanical and wear behavior of Al 4032 composites

Authors: Avinash Gudimetla, MTech Surapaneni Sambhu Prasad, PhD Dumpala Lingaraju, PhD

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Abstract

This study was aimed at developing low-cost composites with high specific strength and better performance by incorporating agro-waste as reinforcements. The stir-casting technique was adopted for fabricating composites with aluminum (Al) 4032 as matrix material and 0, 2, 4 and 6 wt.% rice husk ash (RHA) as reinforcements. The mechanical properties of the produced composites were investigated, and the wear rate under dry conditions was also experimented on, to assess the characteristics of the produced composites. Energy-dispersive X-ray spectroscopy and scanning electron microscopy analyses were done to study the presence and distribution of reinforcements in the matrix material. The surface of specimens after wear test was analyzed from optical microscope images. The influence of process parameters such as reinforcement (wt.%), speed (revolutions per min (rpm)) and load (N) on wear rate was identified, and the parameters were optimized for minimum wear rate using a Taguchi L_{16} orthogonal array. The percentage contribution of process parameters was obtained by performing analysis of variance. Better results were obtained for composites with 6 wt.% RHA with 84 HRB, 92.30 HV, ultimate tensile strength of 383.73 MPa and ultimate compressive strength of 571.6 MPa. Minimum wear rate was obtained for composites with 6 wt.% RHA at 100 rpm and 10 N. Speed was found to be the most contributing factor, with 72.94%, followed by load, with 13.34%, and weight percentage of reinforcements, with 11.88%.

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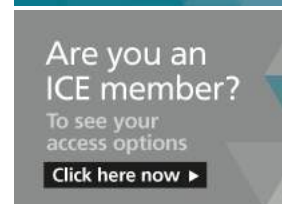Authors: Shi Guo-pu , Wang Zhi , Wu Chao , Wang Cheng-guo
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Comparative study of different pipe geometries using CFD

Manda Akhil Yuvaraj ✉, Geeri Satish ✉

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Abstract

Heat exchangers involve the heating and cooling of fluids inside the conduits which serves as a major industrial application. The augmentation of heat swap can be acquired modifying the geometries which is the most effective technique. By providing the geometry with some intermittent distress promoters along the direction of flow will lead to an increase in the rate of heat swap. In the extant study there are five different geometries considered in total with different shapes of fins/grooves arranged inside the pipe. **The different geometries considered are namely plane rectangle, square groove, rectangle groove, L - Groove 1 and L - Groove 2 and analysed for various inlet velocities using the ANSYS-FLUENT software.** The intent of the work is to obtain maximum amount of heat transfer possible. Among the five different geometries considered, Model – 4 is found out to exhibit the maximum heart transfer at various inlet velocities. This increase in the heat swap values is owed to the accumulation of the flow at the fins arranged. **The pressure and velocity contours are inversely proportional to each other.** So, lower the value of the velocity; higher the pressure will be developed. The pressure developed for a lower velocity contour ultimately leads to the intensification of the heat swap values. The software generated data has maintained good correlation with the regression data. The proposed geometry which was found to be the best can be applied in various fields during the transportation of fluids or any other preferable medium.

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Flow Behavior on Elbow with Various Geometries of Nozzle

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Abstract

Elbow is one of the most common components in the pipe line system, where pressure difference occurs as a fluid flow.Due to the pressure difference, centrifugal force is deve of the fluid flow in a 90° elbow for different geometries of nozzle have been studied using the FLUENT software. Ten different models were investigated based on the K-ε analysis was simulated in terms of the velocity and pressure contours and comparison is done. The analysis has been done for 10 different models with changing the angle found that the velocity gradients are increasing and pressure gradients are decreasing in an ascending order of the angles of convergence for nozzle geometry. The software va values and found to yield good agreement with the simulated values

Keywords

k- Energy Equation, Fluent Software, 90° Elbows.

How To Cite This Article?

Satish, G., and Yuvaraj, M. A. (2019).Flow Behavior on Elbow with Various Geometries of Nozzle. *i-manager's Journal on Mechanical Engineering*, 9(2), 43-51. https://doi.org/10.2 (https://doi.org/10.26634/jme.9.2.15851)

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Review

A Review On Use Of Plastic In Construction Of Roads

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Abstract : The global plastic production is increasing rapidly with rise in population and changes in life style. This makes the disposal of plastic is becoming complicated because of the non-biodegradable property. So it is better to recycle than disposal. One of the trend in recycling of plastic is use in construction of roads. This type of recycling can also help in protecting the environment from the greenhouse gases that are exposed to atmosphere while disposal. The waste plastic in form of bottles, cups, caps, etc are made in form of powder or blended with crusher and coated over the aggregate and bitumen mixture by heating process for roads construction. This polymer coated aggregate and bitumen mixture shows high strength, better binding property, stability, increase in wear resistance, better durability and tear of roads. This makes the recycle of plastic in a efficient manner.

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Design and Fatigue analysis of Steering Components

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ABSTRACT

The manual Rack And Pinion are widely used in the steering system due to its obviousness in design and manufacturing. In Rack and pinion the part that experiences maximum fluctuation in load on pinion, pinion shaft and steering intermediate shaft. In this paper the static analysis of pinion and pinion shaft with AISI 4130 is carried out and a comparison of fatigue analysis of pinion & pinion shaft with AISI 4130 & ASTM A36 is carried out. The intermediate shaft is analyzed with AISI 4130, ASTM A36, Al 4032 & Al 201.The primary modeling is carried out in SOLIDEDGE software and the analysis is carried out in CATIA V5. The objective of the study is to optimize the design and increase the life of steering components.

Keywords: Steering system, Pinion, Steering shaft, intermediate shaft, SOLIDEDGE, CATIA V5, Frequency , Stability

1. INTRODUCTION

The rack and pinion mechanism is commonly used to convert the rotary motion into linear motion. This mechanism contains a circular gear and teeth on a linear shaft. The circular gear is called pinion and the teeth on a linear shaft is called a rack. The rack and pinion steering mechanism are simple in construction and friendly to drive. The mechanism consists of a pinion at the end of the steering column that meshes with the rack.
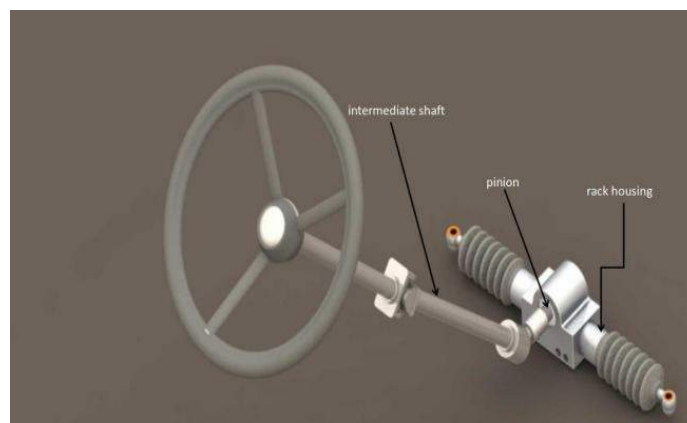
Fig-1: Steering Assembly

The pinion is fixed to the steering column at its end. As the pinion is in contact with the rack, the rotary motion given to pinion is converted to linear motion by the rack. To meet all the steering requirements the rack and pinion steering must be precise and direct under normal driving conditions. A manual rack and pinion gear suitable for a solar car. It is found that the simulation results are higher than the theoretical calculations. The error factor for

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Numerical Simulation for Heat Swapping Behavior on Various Pipe Geometries

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Abstract

The forced flow behaviour for a grooved geometry attached with a nozzle has been analysed in the current study. A geometry with triangular grooves on either walls of the surf
having different angles of convergence. The angle of convergence has been restricted to a range of 10º to 90º. These geometries with the modifications in each of the cas
swapping contours using the ANSYS – FLUENT software. The analysis depicted the results accordingly by the applied conditions using the software conceptions. These concepti
geometry with 45º convergence angle of the nozzle as the optimum one as it has depicted the maximum deviation in terms of the heat swapping. This intermediate geometry l
considered as the best one, i.e,. the mean geometry for both. The generated software results has been compared with the regression data using the equations generated.
maximum accuracy thereby declaring that both the data are in good correlation with each other. These comparisons can be applied to larger models with further modifications.

Keywords

Pipe Geometry, Nozzle, Heat Exchangers, Grooves.

How To Cite This Article?

Palli, S. B., Srimathula, S., Rao, B. S. V. R., and Manda, A. Y. (2020). Numerical Simulation for Heat Swapping Behavior on Various Pipe Geometries. *i-manager's Journal on Mechani*
https://doi.org/10.26634/jme.10.3.17117 (https://doi.org/10.26634/jme.10.3.17117)

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SIGNIFICANCE OF USING HYDRAULIC OIL AS WORKING FLUID IN HYDRAULIC HYBRID VEHICLES

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Abstract— **The consumption of fuel is increasing day to day which leads to the decrease in its content. Burning of fuel releases a huge amount of energy, we need to promote some environment friendly operations and regenerative systems where the consumption of natural resources is optimized there by restoring some quantity of energy released. Hydraulic hybrid system depends on oil based hydraulic fluid or water. In this research the properties of some hydraulic fluids and water are compared and the best fluid is introduced which increases efficiency for the same amount of fuel consumption and energy output may be increase. This results in optimum utilization of fuel. Thus reduces the global warming and pollution. And also increases the life of hydraulic hybrid system components.**

Keywords— **hybrid systems, hydraulic properties, regenerative braking, hydraulic oils**

I. INTRODUCTION

Earlier the main source of transportation is animal power. Here we use animals like bull , horses, donkeys , etc. Slowly after civilization usage of animal power is reduced .the drastic change took place after the invention of steam engines. Later hybrid vehicles came into progress. Though diesel engine is cheaper and versatile than petrol it exhausts harmful substances like Co, Co2, etc causing many side effects to mankind like asthma, lung diseases, chronic heart and other. Henceforth research is made to encourage and develop advanced eco-friendly technology and operations. The use of renewable energy sources like wind, water, biomass instead of excessive usage of non-renewable sources like oil, natural gas, coal are stimulated. also the use of these sources causes increase in global warming and causes damage to health. The potential of water hydraulic technology in hydraulic hybrid system vehicle is implemented. Now a new idea of using a fluid with effective properties other than water is initiated. By

this we can't reduce the use of non renewable energy sources but we can optimize the use.

1.1 literature

Hydraulic regenerative braking is an extensive advantage to hybrid system. The principle is "the hydraulic pump converts mechanical energy to fluid /hydraulic energy and the hydraulic motor coverts the high pressure of hydraulic energy to mechanical energy in order to drive the wheels. Accumulator increase efficiency and provides smoother, more reliable operation. The fuel consumption depends on number of accumulators used in hydraulic hybrid vehicle. The principle requirements for premium hydraulic working fluid is high viscosity index, good chemical stability, good oxidation stability, adequate pour point, resistance to foaming, high flash point.

1.2 Methodology:

In this study we gave a brief description of using hydraulic oils as working fluid in hydraulic hybrid vehicle. As we know hydraulic oils have higher boiling point compared to water. Using oil as a working fluid can also function as a lubricant. Hydraulic oil has chemical additives to improve the performance both the oil and components of hydraulic system. If the viscosity of fluid is high then the hydraulic component efficiency is low. In order to maximize efficiency we use low viscous hydraulic oils i.e. ISO VG2, ISO VG3, ISO VG5 etc.

II. HYBRID SYSTEM VEHICLE:

Heavy commercial vehicles that are in a stop and go mode produce large amount of energy in a moment. This gets wasted in the form of heat energy to the air stream i.e. 30% of vehicle's generated power is dissipated into the air. A hybrid vehicle uses more than one means of propulsion, which is combining a petrol or diesel engine with an electric motor or a

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Some Studies of Mechanical and Thermal Behaviour of CNT based E-Glass Fibre Composites

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Abstract

In this study, a fifteen number of specimens is fabricated by polymers with filler material multi-walled carbon nanotubes (MWCNTs) for proposed percentages and for th
Morphological examination is carried by Scanning Electron Microscopy. The mechanical and thermal properties of the laminates is characterized by tensile, flexural, ha
Results reveal that the mechanical properties are improved by reinforcing the filler material up to the low percentage due to the uniform distribution in matrix materials. Th
increase in MWCNTs, results in an increase in the thermal stability of composites up to 3% due to the strong chemical linkage between the CNTs and the matrix materia
thermal stability decreases due to formation of aggregation of CNTs. By comparing experimental data and statistical data of mechanical and thermal behaviour, no disparity

Keywords

MWCNTs, Glass Fiber, Mechanical Properties, Thermal Properties.

How To Cite This Article?

Geeri, S., and Kolakoti, A. (2019). Some Studies of Mechanical and Thermal Behaviour of CNT based E-Glass Fibre Composites. *i-manager's Journal on Mechanical Engineeri* https://doi.org/10.26634/jme.9.4.16441 (https://doi.org/10.26634/jme.9.4.16441)

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Modeling Study and Dynamic Analysis of Drive Shaft of an Automobile Using Composites

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Abstract

A drive shaft is a mechanical component for transmitting torque and rotation, usually used to connect other components of a drive train that cannot be connected directly because of distance or the need to allow for relative movement between them. As torque carriers, drive shafts are subject to torsion and shear stress, equivalent to the difference between the input torque and the load. They must, therefore, be strong enough to bear the stress, while avoiding too much additional weight as that would, in turn, increase their inertia.

An automobile may use a longitudinal shaft to deliver power from an engine/transmission to the other end of the vehicle before it goes to the wheels. A pair of short drive shafts is commonly used to send power from a central differential, transmission, or trans-axle to the wheels.

Keywords*— Drive shaft, Composite materials, Transmission, Nx Unigraphics, Ansys19.2*

1. Introduction

The superior composite materials which include Graphite, Carbon, Kevlar, and E-Glass with appropriate resins are widely used because of their excessive unique strength (electricity/density) and excessive precise modulus (modulus/density). Advanced composite materials appear ideally fitted for lengthy, power driving Drive shaft (propeller shaft) applications. Their elastic houses may be tailor-made to growth the torque they could deliver as well as the rotational speed at which they function. The Drive shafts are utilized in car, aircraft and aerospace packages. The automotive industry is exploiting composite fabric technology for structural components production to gain the discount of the load without lower in vehicle nice and reliability. its miles acknowledged that power conservation is one of the maximum crucial targets in vehicle design and discount of weight is one of the only measures to acquire this result. There's nearly an immediate proportionality among the weight of a car and its fuel consumption, in town riding.

The strength train of the car has numerous elements in which propeller shaft is the coronary heart of transmission which come across unlucky barriers referred to as disasters. This damage is due to numerous faults, the main reason is fabric and its production and maintenance. Early cars often used chain power or belt pressure mechanisms as opposed to a power shaft. Some used electrical mills and

Influence of Welding Speed on Tensile Strength of Welded in Tig Welding Process

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ABSTRACT

Tungsten Inert Gas welding is one of the widely used techniques for joining ferrous and non-ferrous metals. TIG welding process offers several advantages like joining of unlike metals, low heat effected zone, absence of slag etc compared to MIG welding. The accuracy a nd quality of welded joints largely depends upon type of power supply (DCSPor DCRP or AC HF), welding speed, type of inert gas used for shielding. This paper deals with the investigation of effect of welding speed on the tensile strength of the welded joint. Experiments are conducted on specimens of single v butt joint having different bevel angle and bevel heights. The material selected for preparing the test specimen is Aluminium AA6351 Alloy. The strength of the welded joint is tested by a universal tensile testing machine and the results are evaluated.

Keywords: *TIG Welding, MIG Welding,DCRP,ACHF, Welding Speed.*

1. Introduction

The Stainless steel 316 (SS 316) plate of dimension 300 mm X 150 mm X 10 mm has been used as a work piece material for present experiment study. And ER 316L weld rods are used as filler materials for the weld joining process. A model was generated in ANSYS (A general purpose FEA software) using SOLID BRICK 8 NODE 70 (3D solid element with temperature dof) and PLANE 55 (A 2D Solid Element with 4 nodes), as per the dimensions of the plate taken for the experimentation. A refined mesh is made based on the convergency criteria and the analysis is performed to estimate the temperature distribution. Firstly, a transient thermal analysis was carried out by giving heat flux as the time varying input to estimate the temperature variation. The non-linear material properties are fed for the heat transfer solution. Then coupled field analysis is carried out to get the residual stresses and distortion by coupling thermal analysis to static analysis. The variation of the temperature with time, the residual stresses and distortion are obtained. The variation of these are reported anddiscussed. In addition to experimentation with SS 316, in simulation three more materials are added, they are SS 304, SS 410, SS 430. These materials are selected as these are widely used in the construction fields all the details are discussed in below.

Performance Of Piston Rod And Collar In Hydraulic Cylinder With Different Shapes And Material Configuration

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Abstract

As substantial designing industries develops so is the actualizes and need for all the more dominant systems to activate theories executes. Hydraulic cylinders are a type of mechanical device which is used for moving that creates direct translatory movement. Hydraulic cylinders power required for activation relies upon execute prerequisites and in heavier applications were yield powers required are higher, the interior segments of the chamber needs to withstand this higher burden and thus the plan of pressure driven chamber inward segments picks up significance. The cylinder rod and piston inside the chamber are associated together either by screw or nut. This paper focuses more on these joints which encounters higher tractable or compressive burdens during activities. There are examples during execute activity, when the chamber responds and arrives at its outrageous completely vacant position. When there is no more stroke accessible, the chamber bottoms-up totally putting high ductile burden on the bar and cylinder pole joint which may even prompt nonfeasance of the joint and cylinder chamber. In this examination, a static structural analysis was performed on four compound chamber pole cylinder joints to explore various burdens that please these joints and which is best appropriate joint for modern actualizes with high malleable and preload loads.

Keywords— *Hydraulic Cylinder, Cylinder rod-piston joints, Nonfeasance, High Tensile Load, stroke, Translatory motion Catia, Ansys19.2*

1. Introduction

Hydraulic cylinders get their source of energy from pressurized hydraulic fluid, which is typically oil. The water powered chamber by and large comprises of a chamber barrel, in which a cylinder is associated with a cylinder bar which moves to and fro. The barrel is shut toward one side by the chamber base (additionally called the top) and the opposite end is by the chamber head (likewise called the organ) where the cylinder pole leaves the chamber. The cylinder has sliding rings and seals. The cylinder which partitions within the chamber into two chambers, the base chamber (top end) and the cylinder pole side chamber (pole end/head end). Flanges, trunnions, clevises, and hauls are basic chamber mounting choices. The cylinder pole additionally has mounting connections to associate the chamber to the item or machine part that it is pushing or pulling.

The purpose of this examination is to explore one such realize instrument to find the most extraordinary malleable burden that proceeds the chamber bar joint and required preload for no joint division by applying distinctive material properties to both cylinder pole and neckline and think about the outcomes. The decided malleable and claim burdens are applied on consolidated chamber bar thoughts that are considered for examination in order to find the most proper joint which would withstand the most cynical situation of water powered chamber bottoming-up made by the realize framework by utilizing four diverse cylinder bar joints.

Shake Table Experiment on Reactor Vessel

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Abstract: The importance of Nuclear Power Plants and the consequences of a nuclear accident require that the nuclear structures be designed for the most severe environmental conditions. As the Earth quake is one of the natural hazard that can cause extensive damage to human lives and property it constitutes major design consideration for the system structures and equipment of a Nuclear Power plant. In view of complex nature of analysis, experimental validation results on testing was done with 1/8th scale down model and main vessel with liquid on shake table (3m x3m, 10t capacity.
Keywords: Nuclear accident, structures, natural Hazard, main vessel, shake table

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I. Introduction

Shake table tests are by far the best suited for studying the response of buildings, structures, structural components, equipment and machinery under simulated base excitation. Uni-axial, bi-axial and tri-axial tables are common. In a tri-axial shake table all six degrees of freedom can be reproduced. The shake table consistent with the performance requirements is actuated by multiple servo-controlled electro hydraulic actuators. A rigid mass to anchor the actuators and to support the shake table, a sophisticated electronic control system, and a foundation scheme with or without dampers complete the test facility. Compared to many other test facilities shake tables require a large dedicated building. Unlike many other equipment which can be directly installed once they are bought, shake table systems are custom built. The integration of the various components is to be done at site and large scale checking is necessary before eventual commissioning of shake table system. Even though the test runs for short duration, huge hydraulic power supply is usually required even for moderate size shake tables with reasonable performance criteria. Most civil engineering structures tested on the shake table are modelled to the scale ratios 1:2 to 1:100. Appropriate similitude analysis is used to scale the parameters. Smaller shake tables which are driven by electro dynamic shakers have high acceleration requirements and can support only limited mass. Typically shake tables used for R&D purposes have a payload capacity varying between 10 to 100 t. the acceleration levels are in the range of 0.8 to 2.0 g, velocity in the range of 0.8 to 2.0 m/sec, and displacement in the range of 50 to 200 mm. The performance of the shake table is governed by the performance envelope of the actuator.

II. Important Considerations Relating To Planning And Design Of Shake Table Facilities

Even though as a concept shake table appears simple, there are many critical points to be considered in planning of the shake table system. Some of these are indicated below.

5.2.1 Foundations For Shake Tables

Two types of foundations are common, namely the fixed type and the floating type. The floating type is nearly two to three times as costly as fixed type. The natural frequency of the foundation-soil system lies normally in the range of 20 to 40 Hz. The fixed foundation requires larger mass than floating foundation. Transmission of vibration in to the environment is extremely low in case of floating foundation. Floating foundations have problems at low frequencies, and hence may pose problems for large size models.

5.2.2 Table

Shake tables of the first generation were made with concrete, and several high performance shake tables were with special grade aluminium because of their strength to weight ratio. How ever present day shake tables are invariably made of steel. The table tops are to well machine. The first frequency of the table with actuators should be well above the frequency range of operation.

DESIGN AND ANALYSIS OF VORTEX GENERATORS FOR REDUCING DRAG FORCE IN AUTOMOBILES BY USING CFD

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Abstract: **In the modern day design of vehicles, especially in the automobile industry involves a great deal of aerodynamic design study to analyze the airflow. The aerodynamic drag force adversely affects the forward motion of the vehicle, which in turn reduces the efficiency. If the vehicle is redesigned to optimize the aerodynamic forces, it could produce better results but requires a huge capital to change the complete design. Here in this paper, we are going to use these vortex generators for the sedan modeled light weighed compact cars with various profiled designs and CFD.**

Keywords: **Vortex generator, Drag force, airfoil, CFD**

INTRODUCTION

A vortex generator is a device which is used to control the aerodynamic for the vehicles; it is present on the top surface of the vehicle. Generally these are been used in aerodynamic vehicles such as aircrafts and for cars. When the airfoil is in motion relative with the air, the vortex generator creates an vortex, which by removing the part of the slow moving boundary layer in contact with the airfoil surfaces delays local flow separation and aerodynamic stalling, thereby improving the effectiveness of the wings as flaps, elevators and rudders.

Vortex generators are mostly used to delay the flow of air separation which is travelling on the surface of the object. These are used on the external surfaces of the vehicle. These are commonly in rectangular or triangular in shape. These will be placed obliquely, so that they can acquire the angle of attack with respect to the air flowed on the vortex which creates an energy drawing on the tip moving outside in to the boundary layer in contact with the surface.

The study of air travel above the surface of a solid is called aerodynamics. When an automotive moves in a definite velocity the air flow over the car makes drag which is very undesirable for its performance. An automotive needs more power to overwhelm this drag force. When the aerodynamic stuff of the automotive is equipped to overcome this air resistance, the vehicle can move faster, longer and could be added fuel efficient for the vehicle. The vehicle could advance more down force thus providing better grip between the car and the road. The down force allowsthe vehicle to corner at high speeds. However here exists a balance for high speed because of the improved resistance. The aerodynamic stuff of the automotive can be altered by installing a vortex generator at the rear of a car.

Though the main focuses of vehicle manufacturers, many researchers have been focused on fuel saving strategies of the commercial and non-commercial vehicles till to date. As the numbers of passenger cars are being increased considerably in worldwide, it became an important to study the aerodynamic effects of vehicles. Henceforth in this work, the difference of pressure coefficient with respect to the dynamic pressure with different types of vortex generators (VG) on the roof of a sedan vehicle has been investigated.

EXPERIMENTAL DETAILS

Design of vortex generator

In order to discovery a viable configuration, one must first recognize the significant variables for vortex generator design. In order to decrease the degrees of freedom, most of the variables were stationary based on both analysis and references of previous researchers. A Single vane type delta (triangular) shaped was chosen. Due to their uncomplicatedness and widespread usage, the low drag device than any other type makes the vane type more suitable for attributing on the vehicle body. Delta shaped vortex were most usually used in aircraft wings. In linking with the height, the thickness of the limits were measured based on the assumption that the optimum height of the vortex would be almost near to the boundary layer thickness. Below Figure shows the velocity profile on the vehicle's roof. From Figure, the boundary layer thickness at the roof end directly in front of the separation point is found to be about 2mm. Consequently, the optimum height for the VG is estimated to be up to approximately 5mm. The thickness of VG was fixed at 2mm uniform throughout so as to make a stiffened structure.

CFD Analysis of the model using the necessary boundary conditions

CFD is a simulation of fluid engineering system which runs with a mathematical physical problem formulation and numeric methods such as solvers, numerical parameters, grids, etc., Basically we fluid oriented problems will be solved in the fluid analysis. Before that we need to know the physical properties of the fluid which we are going to use in our project. CFD has a lot of advantages are it has been using in the industries like aerospace, automotive, biomedicine, chemical processing, heat ventilation, HVAC, air conditioning systems, hydraulics, marine, etc.,.

In CFD the fluid used will be a liquid or gasses only. Here for these liquids we require the properties like velocity, pressure, temperatures, density, and viscosity.

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Flow Behavior on Elbow with Various Geometries of Nozzle

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Abstract

Elbow is one of the most common components in the pipe line system, where pressure difference occurs as a fluid flow.Due to the pressure difference, centrifugal force is developed of the fluid flow in a 90° elbow for different geometries of nozzle have been studied using the FLUENT software. Ten different models were investigated based on the K-ε mod analysis was simulated in terms of the velocity and pressure contours and comparison is done. The analysis has been done for 10 different models with changing the angle of c found that the velocity gradients are increasing and pressure gradients are decreasing in an ascending order of the angles of convergence for nozzle geometry. The software values values and found to yield good agreement with the simulated values

Keywords

k- Energy Equation, Fluent Software, 90° Elbows.

How To Cite This Article?

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Section Articles

Optimization of the Francis Turbine to Get the Better Performance and To Decrease the Vibrational Effects in the Loading Conditions

** Avinash. G**

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Abstract

Water has a lot of potential to produce electricity with much constant voltage value. Hydro-turbines are usually used to operate at variable load due to different climate nature over the whole annum. Loadings are the reasons of vibrations which result in failures. In Francis Turbines loading are due to the fluid pressure and centrifugal force of runner. Problems failure occurs in different stages like: (1) changes in microstructure; (2) microscopic cracks formation; (3) microscopic flaws growth (dominant cracks); (4) dominant macro-crack propagate stably; (5) instability of structure/complete fracture.

In this thesis we are going to design the existing Francis turbine and optimize the design where the stress and the deflections are high for the existing design and even the material optimization is being done to get the better outputs. Structural and the modal analysis are used to get the outputs.

European Journal of Business and Social Sciences (EJBSS)

EFFECT OF EQUAL CHANNEL ANGULAR PRESSING ON THE MECHANICAL PROPERTIES OF AL 4032–SiO$_2$ NANO COMPOSITE MATERIAL

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Abstract— The objective of the present study is to analyze the effect of Equal Channel Angular Pressing (ECAP) on the mechanical properties of Al4032–SiO$_2$ composite. These composites have been prepared by stir casting route in which the weight % SiO$_2$ nano particles are 0.25, 0.5, 0.75 and 1wt%.The ECAP process is done at a room temperature using a die with channel angle of 105° and corner angle 30^0. The influence of ECAP on mechanical properties of Al4032 –SiO$_2$ composite is evaluated. In general in any composite the distribution of reinforcement particles can be observed with the micro-structural examination, but the effect of ECAP will be there on the mechanical properties of composite, so that here we have taken the evolution of Al4032-SiO$_2$ mechanical properties before and after ECAP process. As the agenda of ECAP is to improve the mechanical properties we have observed the great improvement in the mechanical properties.
Keywords— AL 4032, SiO2, Composite Material, Stir-Casting, ECAP, & Mechanical Properties.

I. INTRODUCTION

From the past few years, many of the researchers are focused on finding the light weight and better performance materials to replace the existing heavy weight materials [14,15]. The aluminium alloys (Al4032) are widely used for manufacturing the internal combustion pistons in place of cast iron and other heavy weight materials [1,3], because of their lesser weight[14,15]. Some of the researchers prepared the Al base metal matrix composites reinforced with SiO$_2$ to enhance the mechanical properties [2,14,15]. To prepare the composite material people choose a best and easy process called stir casting process [4,5]. This process is widely used to prepare the composite materials.

But the major problem is dislocations or porosity or defects those occur in the composite material while casting. These defects reduce the strength of the materials. To overcome this issue we have advanced technique called sever plastic deformation. By using the SPD (sever plastic deformation) technique we can produce an ultrafine grained (UFG) and even Nano grained materials [7,8]. We have some of the SPD techniques to produce the UFG or Nano grained materials. These are 1. Equal Channel Angular Pressing (ECAP), 2. Multi Axial Compression (MAC), 3.High Pressure Torsion (HPT) and 4. Accumulative Roll Bonding (ARB) [7, 8],.5. Twist Extrusion (TE). In the above five methods the ECAP is most efficient and easiest technique [9, 10, 11].

. In the ECAP die we have two intersecting angles i.e. channel angle105^o (ɵ) corner angle 30^0 (Φ).The sample specimen is simply pressed through the die with application of load and lubricant.

Figure-1 : Equal Channel Angular Pressing Die

DESIGN OF MULTI CONTACT–AIDED CELLULAR COMPLIANT MECHANISMS FOR STRESS RELIEF

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Abstract— **Many engineering applications need materials having specific properties. Some of these applications demand conflicting properties such as high strain – high strength, high strength – low density, high thermal conductivity – high thermal diffusivity. Nature, on the contrary, offers materials of only a limited range of properties. Such materials may not be the most suitable in many cases. Therefore, new materials such as alloys, composites, foams, and/or sandwich structures are tailored to meet specific needs.**

In this particular study the behaviour of multi contact-aided cellular complaint mechanisms are studied using Finite Element methods , the load carrying capacity of cellular members with multi contact-aided compliant mechanisms is studied under all compression, tension and shearing conditions.

Keywords— **Cellular Compliant Mechanisms, Acrylic, HDPE, Polystyrene, Catia V5, Ansys 16.1.**

I. INTRODUCTION

Cellular structures are either repeated in space in a patterned manner or distributed randomly (as in the case of foams). A unit cell is the representative element of a patterned cellular structure. The unit cell has same effective properties as those of the corresponding extended cellular structure . Many such cellular structures and unit cells are compliant mechanisms. Such that cellular structures can have a relatively high strength-to-weight ratio [1], vibration absorption characteristics [2], and high flexibility [3,4]. New cellular structures such as chiral [5], flex-core [6], and accordion [7] have been developed for their potential applications in daily use. Topology optimization is a tool that can be used to find the features such as the number, location and shape of holes in a solid structure and the distribution of material over a domain. The optimal material distribution depends on specific objectives such as the compliance of a structure for a given volume fraction. Another objective function might involve finding an optimal material microstructure, a process known as inverse homogenization [8]. Homogenization involves estimating effective elastic properties for a given material microstructure. Estimation of homogenized coefficients using finite element (FE) methods was first presented in Ref. [9]. Such homogenization theory has been successfully used to design material microstructures either for a prescribed elasticity matrix and to obtain a composite structure with external properties .The Contact-aided compliant mechanisms, which experience contact during deformation, have also been synthesized using topology optimization . In one such study, unilateral contact is considered for the compliance minimization of structures .

II. METHODS

2. Method

Two alternative approaches are presented for designing complaint structures with graded stiffness. The first approach is focused on achieving graded or increasing stiffness with applied load. The second approach is focused on customizing stiffness according to location.

Simulation Analysis on Femur Bone Along with Fracture Fixation Plate

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Abstract— The Biomechanics is the application of mechanical principles on the living organisms and utilizing the principles of physics, simulation and study of biomechanical structures are carried out. Finite Element Method is one of the widely accepted tools for modelling the biomechanical structures. The femur bone is the most proximal bone of the leg in vertebrates capable of walking and jumping. This paper presents the analysis of Femur bone fracture fixation plates using Finite element method.

The Femur bone model is taken from online library and analysis is carried out in an ANSYS environment. Different models of fracture fixation plate is modelled using the commercially available Catia V5 software. The stress distribution at the fractured site of the femur is obtained when the system is subjected to compressive loadings along with various healing stages. The effects of the use of different biomaterials for the plates and screws on the stress distribution characteristics are also investigated. In addition to materials from base papers new materials are studied

Keywords— Femur, Fracture, CatiaV5, Biomaterials, Ansys

I. INTRODUCTION

Medical definition of Prosthetic:

First Referring to a prosthesis, an individual artificial substitute or replacement of a human part of the body such as a tooth, eye, a hip, a facial bone, the palate, a knee or another Body joint, the leg, an arm, etc. A prosthesis is designed for fully functional or cosmetic reasons or both. Typical prostheses for joints are the elbow, ankle, and hip, knee, and finger joints. Prosthetic implants can be used in the parts of the joint such as a unilateral knee. Joint replacement and surgical reconstruction or replacement of a joint.

Design Consideration of Modern Prosthetic: They are many factors that are taken in to consideration, when designing the Prosthetic. Some of the reasons are as Follow

1-Fitness of the Prosthetic Users

2-Weight of the Given Material or Using For the Material

3-Energy Storage and return by the Equipment

4- Ground compliance

5-Rotation – ease of changing direction

Large segmental defects and non-unions in long bones caused by fracture, infection, tumour or cysts are still a challenging problem in orthopaedic surgery. The stable fixation of an osteosynthesis system is necessary for the bone healing process and the clinical success of the implant. Manufacturers worldwide developed various methods to offer maximum intra operative flexibility (e.g. poly axial screws) and stable screw-plate connection (e.g. angular stable fixations) [1], [2]. The functionality of the mentioned fixation methods has been demonstrated in several experimental studies [3]–[5]. Nevertheless, experiment Besides experimental testing, finite element analysis (FEA) has grown to a powerful tool in order to analyze stresses and strains within structures during static and dynamic load situations. Moreover, it offers detailed information which cannot be determined with experimental methods. Due to the capability to analyse the influence of various parameters on implant components during the preclinical testing, without prototype production, the FEA has become an irreplaceable tool with various applicability. Therefore, it is a common method in mechanical engineering and gains more and more influence in biomechanics.

DESIGN OPTIMIZATION OF AERODYNAMIC DRAG AT THE REAR OF GENERIC PASSENGER CAR

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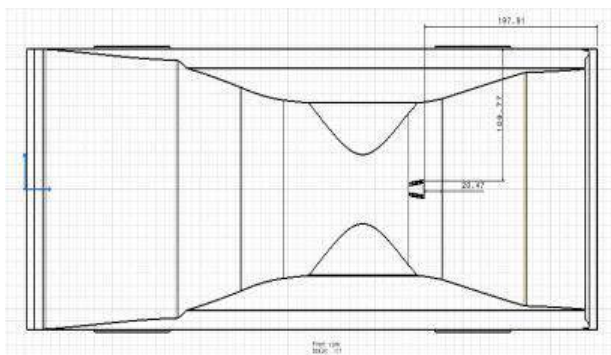[2] Asst.Professor, Dept. of ME, Pragati Engineering College, Surampalem, *sri.sri7777@gmail.com*

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Abstract-. **In vehicle body design and development the reduction of drag is essential since the primary concern of automotive industry is fuel consumption and protection of global environment. Aerodynamic drag of a commercial vehicle is a large part of the vehicles fuel consumption and it can contribute to as much as 60% of the vehicles fuel consumption. It has been established that systematic aerodynamic study of the rear end of a vehicle can help to improve its aerodynamics since one of the main cause of aerodynamic drag is the separation of flow near the vehicle rear end. The most practical way of drag reduction at the rear end is to use an effective flow control technique. In this thesis two different models of commercially available cars are tested with two different models of vortex generators placed at 3 different locations of the rear end using simulations and the acquired results are discussed briefly in the conclusion.**
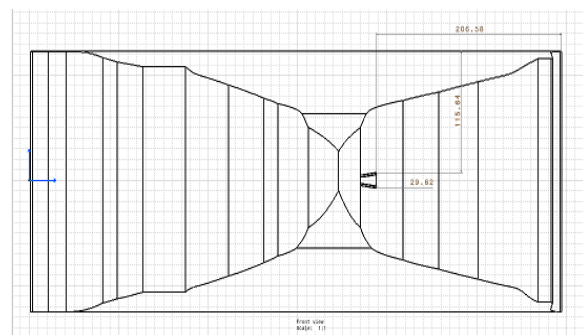
I. INTRODUCTION

A vortex generator (VG) is an aerodynamic surface, consisting of a small vane that creates a vortex. Some surfaces on an airplane can result in air flow separation from the surface or skin. A vortex generator creates a tip vortex which draws energetic, rapidly-moving air from outside the slow-moving boundary layer into contact with the aircraft skin. This keeps the flow close to the aircraft surfaces. Vortex generators can be found on many devices, but the term is most often used in aircraft design. Vortex generators are also being used in automotive vehicles. In one form they are used as in aircraft to influence the boundary layer of air flow primarily for drag reduction. Vortex generators are likely to be found the external surfaces of vehicles where flow separation is a potential problem because VGs delay flow separation. The vortex is oriented by appropriate placement of the vortex generator in order to redirect airflow in the flow field so that adverse interactions are prevented or delayed. With this mechanism, the generators act as a flow deflector.

II. CATIA MODEl

Fig: Model 1 from catia model

Fig: Model 2 from catia model

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Experimental Studies on Mechanical Properties of Polymer Based Composites

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Abstract

Polymer composites have good characteristics like modulus/weight ratio, strength/weight ratio, excellent fatigue and non-corroding properties which encourage to the extensiv
about the orientation of fiber effects on the mechanical properties of E-glass reinforced polymer composites which is essential. For three different orientations (0º/90º, 0º/45º & 0º/
composites are fabricated by hand-layup technique and these specimens were subjected to tensile, flexural and hardness testing as per the ASTM standards. This paper evaluat
orientation of E-glass fiber in order to improve the strength and hardness. The experimental results reveal that the best tensile strength and hardness values are obtained for 0º/90º
is for 0º/45º orientations specimen. Regression analysis is utilised to check the validity of the experimental data. The results demonstrated that the created quadratic models ar
experimental values for mechanical properties.

Keywords

Epoxy Laminates, E-glass, Hand-Layup, Regression Analysis

How To Cite This Article?

Satish, G., Prasad, S. S., and Prasad, V. V. S. (2018). Experimental Studies on Mechanical Properties of Polymer Based Composites. *i-manager's Journal on Mechanical Engineering*, 8(
https://doi.org/10.26634/jme.8.4.14102 (https://doi.org/10.26634/jme.8.4.14102)

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Online

Design and Analysis of Boeing 747 Aircraft Wing Rib Using Composite Materials

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Abstract:

A wing resembles a fin like structure which is employed to deal with aerodynamic forces make easy movement through air and other gases, or water and other liquids. As such, wings have a streamlined cross-sectional shape and a lift of aerofoil shape.

Wing design is constantly evolving. If you were to compare the modern aircraft, such as the Boeing 747 with the wing of the Wright Flyer, the difference is remarkable. An aircraft's performance is based on the number of lifting surfaces, shape, size and materials used. Day by day need for stronger and lighter materials is increasing rapidly .So many studies are introduced to check the usefulness of latest materials in aeronautics. In this study, we are intended to contribute some work regarding material feasibility requirements in aeronautics.

In this study the static behavior of an aeroplane wing is studied under flight conditions with several composite materials and different wing models. Drag and lift values are calculated based on the wing surface area, relative velocity of plane and density of the air (based on altitude). Simulation is done using Ansys Fluent module.

Introduction:

A wing resembles a fin that produces lift, while moving through air or some other fluid. As such, wings have streamlined cross-sections that are subject to aerodynamic forces and act as an airfoil. A wing's aerodynamic efficiency is expressed as its lift-to-drag ratio. The lift of a wing generates at a given speed and angle of attack can be one to two orders of magnitude greater than the total drag on the wing. A high lift-to-drag ratio requires a significantly smaller thrust to propel the wings through the air at sufficient lift.

Lifting structures used in water, include various foils, including hydrofoils. Hydrodynamics is governing science, rather than aerodynamics. Implementation of underwater foils occur in hydroplanes, sailboats and submarines.

Theory

Aerodynamics:

Low pressure region under condensation over the wing of an Airbus A340, passing through humid air Flow are used in various configurations to increase the wing area and to increase the lift. In conjunction with spoilers, flaps maximize drag and minimize lift during the landing roll.

Study of behaviour of wings of aircraft is an important area of study in the science of aerodynamics. The beltings of the airflow around any moving object can – in principle – be found by resolving the Navier-Stokes equations of fluid dynamics. Except for simple geometries these equations are particularly solve difficult. But easier explanations can be described. To produce "lift" for a wing, it must be adjusted at a suitable angle of attack relative to the flow of air past the wing. When this takes place the wing deflects the downwards airflow,

"Turning" the air as it passes the wing. Since the wing make use of a force on the air to change its direction, the air must exert a force on the wing, equal in size but opposite in direction. This force manifests itself as differing air pressures at different points on the surface of the wing.

Cross-sectional shape:

Wings with a uniform cross section are the norm in subsonic flight. Wings with a symmetrical cross section can also generate lift by using a positive angle of attack to avert air downward. Symmetrical air foils have higher stalling speeds than cambered air foils of the same wing area but are used in aerobatic aircraft as they provide practical performance whether the aircraft is upright or inverted.

Modelling and Strength Analysis of Diaphragm Accumulator

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Abstract— **Diaphragm accumulators uses the compressibility of a gas (nitrogen) in storing hydraulic energy. This nitrogen gas is required because fluids are practically incompressible and cannot store energy by themselves. The diaphragm is used to separate the gas and the fluid sides of the accumulator. These are successfully applied to both industrial and mobile applications to store energy, maintaining pressure, leakage compensation and vehicle hydraulic systems.**

Keywords—**Accumulator, Diaphragm, Pressure, Analysis, Sructural**

I. INTRODUCTION

All the energetic systems, like mechanical, electric, hydraulic or some combination of these systems can be expressed in terms of effort and flow. The power transferred from one energetic element to the other energetic element is always a product of the two elements like force and velocity, voltage and current, pressure and volumetric flow rate. The energy is the time integral of power, so energy transfer can be simply measured as the integral of this product over time. The relationship between flow and effort is a reactionary one, governed by the properties of each system element. For potential energy storage elements, this relationship is an algebraic function between the integral of flow and effort, force and displacement for springs, charge and voltage for capacitors, volume and pressure change for hydraulic accumulators. Hydraulic accumulators have the ability to store excess energy and release it whenever needed. These are useful tools for improving hydraulic efficiency. Industrial accumulators are classified as hydro and pneumatic. This type of accumulator applies a force to the fluid by using compressed gas. The two common types of accumulators are the rubber bladder type and the piston type accumulator. The below presented is the rubber bladder type accumulator. Just as spring constants dictate the force displacement relationship of springs.

The bulk modulus (the inverse of compressibility) dictates the relationship between pressure and volume change in hydraulic accumulators. Since hydraulic fluid itself having very high bulk modulus, miniscule changes in the volume of a closed hydraulic system result in large swings in pressure. Pump-motor noise can cause unsafe pressure fluctuations in this way if unaccounted. Commercial hydraulic accumulators resolve this by providing temporary storage for this oscillating flow in a device with a much more favorable pressure-volume change relationship. Because they contain bags of compressible gas, these accumulators have a much lower efficient bulk modulus and thus respond to small changes in volume with even smaller changes in pressure.

II. LITERATURE SURVEY

Zainol (1990) have reported that the major problem of back pressure vessel was the loss of steam of about 27 to 50% to the atmosphere. This is due to its design and size which are not specific for accumulating and controlling the steam distribution to the sterilizers and factory heating. Its function is more as a temporarily steam storage vessel for maintaining the turbine performance. The practice of venting off steam from the back pressure vessel to atmosphere over a certain minimum time is inevitable when the accumulation of steam in the back pressure vessel exceeds the relief valve set point (around 45 psi). Consequently, there is a deficit in steam supply to the sterilizers, resulting in fresh fruit bunches not being fully sterilized.

Mustafa (1994) have identified three major types of disturbances that led to the severe steam fluctuations in steam supply and demand. The most critical type is random steam fluctuations in boiler, steam turbine, back pressure and sterilizers resulting in steam venting or time delay. The next disturbance is variation of boiler pressure due to inconsistent fuel quality which affects all units downstream and the last type is random steam injection in palm oil stream such as digester to maintain temperature and flow.

SYNTHESISAND CHARACTERIZATION OF ALUMINUM (4032) METAL AND NANO SiO$_2$ COMPOSITES FOR EVALUATING THEIR MECHANICAL PROPERTIES

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Abstract- Metal matrix composites (MMC's) have evoked a keen interest for automotive and small engine applications because they have preferable combinations of mechanical characteristics. In recent times, it could be noticed that development of the metal matrix composites (MMC's) has been emerged as a significant area of research in material science. The reinforcement in metal matrix composites is in the form of continuous or discontinuous fibers, whiskers or particulates, in various weight fractions. Among metal matrix composites, particulate reinforced AMC's are chosen due to their better mechanical and physical properties. Aluminum metal matrix composites exhibit desirable properties than individual conventional material used alone. The present investigation is aimed at evaluation of mechanical properties of Al 4032 reinforced with nano- SiO$_2$ at different wt% 0, 1, 2, 3 by stir casting method. The mechanical properties of MMC's viz., tensile strength, compression strength, impact strength and hardness strength, microstructure were characterized.

Keywords- Metal Matrix Composites, Stir casting, Nano - SiO$_2$, Al 4032

I. INTRODUCTION

Composite materials are natural and manmade materials consisting of two or more constituents which give superior properties than those of the individual component used alone. The constituents of MMC's are having intimate contact with each other, with a recognizable interface between them which are not soluble in each other. As compared to metallic mixture, each and every material has its individual physical, chemical and mechanical properties. The two constituents are reinforcement or fortification and a matrix. The primary interest of composite materials are their high strength and stiffness, low density when compared to bulk materials, which provides a weight reduction in the finished part. In almost all cases, the fortification is harder, stronger and stiffer than matrix[1].

Metal matrix composites are class of newborn materials which are appealing for enthusiasm towards industrial and investment worldwide. Metal matrix composites are different from extensively grown organic polymer matrix composites because of their metallic character in respect of physical and mechanical properties such as electrical conductivity, thermal conductivity, shear strength, ductility and impart themselves to traditional metallurgical processing operations. They can resist to elevated temperatures in devastating conditions than organic polymer matrix composites. Most metals and its mixture employ as matrix and strengthening materials should be stable over extent temperature and non reactive too. The sort, form and spatial arrangement of the fortifying stage in metal matrix composites are the main variables in determining their mechanical properties. In processing of MMC's is to ability to select the appropriate matrix and a fortification material. Here, matrix materials employ in MMC's are aluminum, magnesium, aluminum-lithium, copper, titanium and super amalgams and the fortifying stage may be in the form of particulates, fibers, whiskers. Some of the major particulate fortified in composites materials is alumina, silicon carbide, fly ash, titanium carbide, boron carbide, quartz , graphite and so on. In specific, particulate fortified MMC's recently discovered special interest due to their specific strength and specific stiffness at room and hoisted temperatures. The enlargement of MMC's became great extent due to its low density and low cost fortifications[2].

Among above MMC's, aluminum is the most common matrix material because of its low density, good corrosion resistance, high thermal and electrical conductivity and damping capacity. The inclusion of hard and stiff ceramic stage has been entrenched to make better modulus behavior and strength properties in metallic matrices. For instance, the fortifying phase SiO$_2$ yields both physical and mechanical properties. Discontinuously fortified aluminum matrix composites are useful in many applications like engine piston, cylinder drum, transmission valves and so on [3]. According to I.A. Ibrahim et al., the processing methods[4] utilized to manufacture particulate reinforced MMCs can be grouped depending on the temperature of the metallic matrix during processing which includes liquid phase processes, solid state processes and two phases (solid-liquid) processes. The studies further revealed that the physical properties, strengthening in metal matrix composites has been related to dislocations of a very high density in the originating from differential thermal contraction, geometrical constraints and plastic deformation during processing.

3d Modeling and Thermal Analysis of Electrical Transformer Cooling System.

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ABSTRACT:-The electrical transformers are key components in the electricity distribution units. The efficient working of transformer plays a crucial role in residential, commercial and medical, also proper functioning of hospitals, Security, networking, banking and industrial sectors. The load on the transformer and ambient temperatures are two important factors that are influencing on the life of the insulating material. The age of the transformer is based on the life of insulating material.

This paper presents, the advanced naturel cooling system designed for Oil Natural Air Natural Transformer by using CATIA 3D Modeling for reducing the transformer hot spot temperature and increasing the life of insulating material. By this way, we get the increased life of the transformer and sudden failures can be avoided.

Keywords:- Age of The Transformer, Life of Insulating Material, Transformer Cooling System, Hot Spot Temperature, Thermal Analysis, CATIA 3D Modeling and ANSYS.

1. INTRODUCTION

The transformers are electrical static devices, which are used to alter the voltage and current levels from low to high or vice-versa with constant power output. Generally, the transformers are high efficient (around 95%) [3, 5]. The transformers are generally classified into two types. These are step-up transformer and step down transformer.

The life of the transformer purely based on the load and ambient temperatures because it affects the insulating material in the transformer (1, 2). In the transformer the insulating material is used for obstruct the direct flow of electricity from on part to another part for avoiding the short circuit. Generally the transformers are having good life in mechanical arrangements because there are no moving parts or rotating parts. The transformer life is directly affected by high temperature causing increasing load on the transformer or high ambient temperatures [1, 2, 3].

In summer seasons the load on the temperature is too high and also the ambient temperatures are also high as compared with winter and rainy seasons. So that many of the transformers will fails to work in summer condition due to short circuit. This is because of in the transformer the insulation material will burn due to the overheat [4]. To overcome this issue some external assistance is provided to cool down the transformer to get increased life, but the efficiency is reduced due to utilization of energy within the network.

Based on the literature survey if the load and ambient temperature increase the age of the transformer is reduced. For this purpose innovative cooling system is required for Oil natural and air natural transformer to dissipate the more heat [7].

A. About Transformer Cooling System and Necessity:

As we know that the transformer is used for alter the voltage levels, during the alteration process the heat is generated in the transformer due to resistive losses occurring across the transformer parts.

The generated heat is harmful to the transformer age, because the insulating material used in the transformer fails due to heavy heat. Whenever the insulation failed, the transformer also fails [6].

The life of the insulating material is based on the transformer hot spot temperature. So we must dissipate the heat to the surroundings and reduce the temperature within safe limit.

Strength Analysis of Sandwich Panels by Considering the Shape Effect of Grid Stiffened Core

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ABSTRACT- A sandwich-structured composite is a special case of composite material which consist two stiff and strong skins or faces separated by a thick light weight core. The core is normally having very low strength, but its higher thickness provides the sandwich composite with high bending stiffness with overall low density. This construction is one of the most valued structural engineering innovations developed in the composite industry. It finds its applications in industries like aerospace, transportation rails etc. In the current application static 3-point bending tests were carried out in order to investigate deflection variations in honeycomb sandwich structure by varying the load and also its effect on cell shape of the core. The sandwich structure consisted of Aluminium honeycomb core with stainless steel facing.

Theoretical calculations and Simulation analysis are carried out by using Catia and Ansys to study the deflections for various loads. The obtained results are compared with experimental values.

Keywords — sandwich composite, Honeycomb Core, Rectangular Core, cell shape of core, 3-Point bending, Catia V5, Ansys R18.1.

I. INTRODUCTION

The idea of sandwich construction has become tremendously popular among the all possible design concepts in composite structures, because of the development of man-made cellular materials as core materials. Sandwich structures consist of

1) A pair of thin but strong skins

2) A thick, lightweight high stiffened core to separate the skins and to carry loads and

3) An adhesive attachment which is capable of transmitting shear and axial loads (Fig. 1.1).
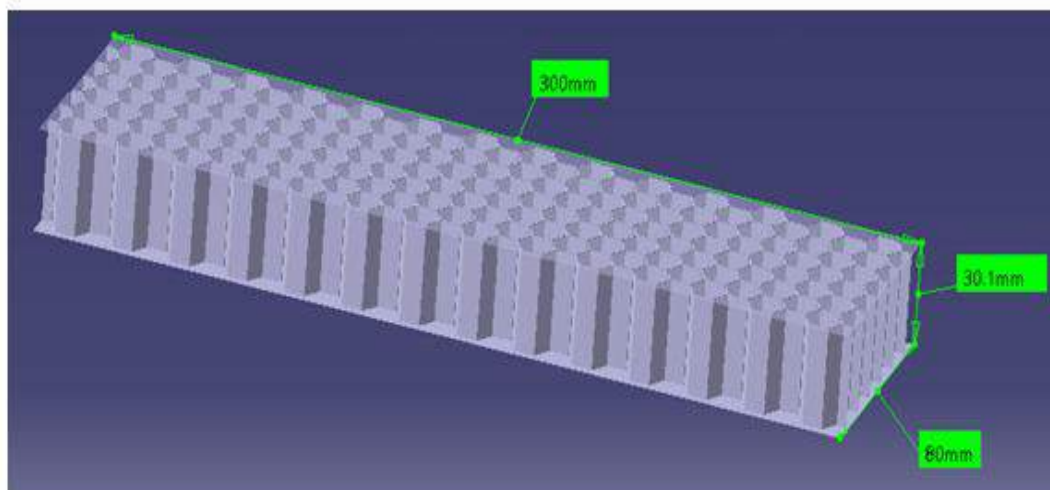
(Fig. 1)

Design and Experimental Investigation on Tensile Strength Properties Using Different Forms of Layers for Epoxy Materials

Dr S Sambhu Prasad & Sri Avinash Gudimetla

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ABSTRACT

In aeronautical, marine and automobile industries the use of composites has increased due to their high stiffness and strength-to-weight ratios long fatigue life, resistance to electrochemical corrosion and other superior material properties of composites. In this paper, the experiments of vibrational analysis are carried out using Kevlar. Samples of Kevlar composites of different layers are used in this research. composites are truly materials of future, composites will help in developing components with better fatigue life and strength also these composite components can be tailor made to match the exact requirement. In this work we are developing and studying the behaviours of two different composites (regular and hybrid), hybrid composites are those which have multiple fiber reinforced lamina in their laminate. Configurations of the composites are as follows

E-glass/epoxy$(0)_3$, E-glass/epoxy$(0)_5$, E-glass-Kevlar/epoxy$(0)_3$,E-glass-Kevlar/epoxy$(0)_5$, E-glass/epoxy$(0)_3$(2mm – 2nd layer thickness), E-glass/epoxy$(0)_5$(2mm – 2nd & 4th layer thickness), E-glass-Kevlar/epoxy$(0)_3$(2mm – 2nd layer thickness),E-glass-Kevlar/epoxy$(0)_5$(2mm – 2nd & 4th layer thickness) in hybrid composite specimens reinforcement is changed in alternative layers.

INTRODUCTION

A composite material is composed of two or more materials and holds the properties which could not have been attained from any of its principal materials. In such materials the main load bearing supporters are the fibers. The matrix has low modulus and high elongation and it delivers elasticity to the structure keeps the fibers in situation and protects them from the exterior forces of the atmosphere.

Composites have wide use in mechanical and aerospace applications due to their high specific stiffness and high specific strength. Fiber-reinforced composites usually exist in the form of thin plates. They are most of the time subjected to compressive loads which when it reaches critical buckling load has a possibility of failure. Hence the buckling behavior of the composites has been a major concern.

Laminated composite plates are made up of plates consisting of layers bonded together and made up of materials chemically different from each other but combined macroscopically. These have an application in aircrafts, railway coaches, bridges et cetera because they are easy to handle, have got improved properties and the cost of their fabrication is low. But their failure can lead to catastrophic disasters. And generally the failure of these structures is due to the combined effect of excessive stresses on it and buckling. Hence the buckling behavior

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Home > Vol 5, No 15 (2018) > **Gudimetla**

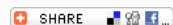## Investigation on the Effect of Corrosion on Mechanical Properties of Al 6061 & Al 7075

Sri Avinash Gudimetla, S Sambhu Prasad

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Abstract

In this thesis we are going to analyze the Aluminium alloys of series Al 6061 and AL 7075 by conducting mechanical tests. And the mechanical properties differences are spotted in the corrosion test. ASTM Corrosion Testing is provided, including the ASTM B117 Salt Spray Test. For the initial work pieces and later hardness test is carried out for testing the hardness of the materials which is better. Here even the corrosion timing is also varied according to the 10, 20, 30 hours for the sample pieces. After that we have verified with the hardness test machine for the strength of the material using Rockwell tester machine. 3 samples have been taken for each alloy, so totally 6 samples have been tested and the results are verified.

ABOUT TH

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Design and CFD analysis of Different Pipe Joints Used in Water Supply Industries

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*Corresponding Author: P. Kumar Babu, Professor, Mechanical Engineering Department, Pragati Engineering College, A P, India.

ABSTRACT

Pipe Distribution network system is very common in industries such as water supply industry, nuclear power plant industry, chemical industry, water treatments plants etc, where the fluid or gases to be transported from one location to other location . The pressure loss may vary depending on the type of components used in the total network, material of the pipe, the fluid that is being transported through the network and pipe fitting. The analysis of pipe network is very important in engineering point of view. A lot of engineering problem dealt with it.. Fittings are used in pipe and plumbing systems to connect straight pipe or tubing sections, to adapt to different sizes or shapes, and for other purposes, such as regulating or measuring fluid flow. Most commonly used fitting or joints in industries are Elbow joint, T-joint and straight joint .

One problem facing today's water supply industries are flow-accelerated corrosion and erosion in pipe joints. The model geometry of three different pipe joints i.e. Elbow, T section and straight joints are created by using solidworks 2016 software and the simulations are being performed using the ANSYS CFD FLUENT module after mesh were created using the ANSYS software. This report documents the results of the simulations that have been made to date; baseline results employing the RNG k-ε turbulence model are presented. Pressure, velocity, shear stress on wall, turbulent kinetic energy inner surface of elbow joint , straight joint & T - joint are shown in figures, and there values are noted and tabulated.. Plots of the velocities, pressure field, wall shear stress, and turbulent kinetic energy adjacent to the wall are shown within the three different joints section.

INTRODUCTION

The water Industry provides drinking water and waste water services (including sewage treatment) to residential, commercial, and industrial sectors of the economy, it total distribution system depends on piping and pipe fitting.

The pipes are used for transporting various fluids like water, steam, different type of gases, oil and other chemical with or without pressure from one place to another place. The pipe material used in pipe network system depending on the application. Cast iron, wrought iron, steel, and brass are the material generally used for pipes in engineering practice. The fluid to be conveyed in pipes whose temperature to be varied but the annual average temperature is 35

°C while the relative humidity varies generally from 70% during the day to 90% at night. The temperature of potable water to be conveyed in the pipelines will be about 30° C. The pipes used in petroleum industry are generally seamless pipes made of heat resistance chrome molybdenum alloy steel. Such type of pipe can resist pressure more than 4Nmm2 and temperatures greater than 440.c.

The pipes for a particular use cannot be made of desired length. Therefore pipes of standard length are taken and joined together with the help of different pipe joints. Pipes and pipeline components, including their protective coatings and joint materials, that will or may come into contact with potable water shall not constitute a toxic hazard; shall not support microbial growth; shall not cause taste or odour,

IOT Security Challenges and Measures to Mitigate: Novel Perspectives

AUTHORS

Manas Kumar Yogi

Y Himatej

M Mahesh reddy

ABSTRACT

The Internet Of Things describes the ever-growing number of intelligent objects that are being connected to the internet and each other, smartphones, tablets, wearable technology and smart home devices are adopted into our everyday lives. The security of IOT is becoming more complex and may have a serious consequence. So, now we have many security challenges like privacy concerns, routine cryptography, passive data collection etc. Many people hide personal data in social media to eliminate these sort of privacy issues but common man nowadays is becoming a passive participant due to lack of security in these IOT devices that are surrounding us.

IoET: From Paradox To Paradigm

AUTHORS

Manas Kumar Yogi

Darapu Uma

K Mahesh Kumar

P Bhanu Prakash

ABSTRACT

The current importance and future promises of the Internet of Things(IoT), Internet of Everything(IoET) are diligently discussed in this paper. The analysis clearly distinguishes between IoT and IoET which are mostly considered to be the same by novices. Upon examining the current advancement in the fields of IoT, IoET, the paper presents scenarios or the possible future expansion of their applications also considering security aspects as same.

Future Research Directions in Crowd Computing: A Novel Perspective

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Abstract: This paper discusses areas where crowd computing needs attention to optimize crowd resources as well as increase the efficiency of crowd computing. We explore only three horizons namely user modeling, labels integration, sample selection. We observe that each one is a research area in its own where work has been progressing at appreciable rate. But they are open issues, so scope of improvement exists in all the areas of crowd computing. Our paper is a sincere attempt to bring out the shortcomings of current strategies used in development of crowd computing applications. This paper will serve as a readymade guide for researchers who attempt to treadin the path of crowd computing research.

Keywords: Crowd sourcing, Crowd computing, model selection, label classification, uncertainty.

I. INTRODUCTION

Human beings are capable of solving non-algorithmic issues. Crowd computing approach exploits this strength where computers cannot perfectly solve the problem. Human group can efficiently solve few areas of computing where machine intelligence cannot outperform humans. Humans perception in certain issues have better approach which cannot be installed in computer systems due to natural behaviour of human beings. The term crowd sourcing was advocated by Jeff Home in the year 2006. The operating principle is simple. A group of people are asked to perform a task to contribute to a complex task which cannot be finished by a single person. For instance, Wikipedia which is one of the most popular crowd-computing system where daily millions of users are contributing to the content on various topics all over the world. There are many benefits of crowd-computing. Business organisations reap innumerable benefits from users feedback to improve their services. Classical AI systems have some inherent shortcomings. For example, the optical character recognition (OCR) perform poorly when it comes to low quality of characters. Using crowd-computing recaptcha system is built to serve the purpose. Two different OCR systems are used along with a reference directory to achieve a valid authentication. According to experimental results by Newyork Times Archive, the Recaptcha system acheived 99% precision against 84% of standard OCR systems. One of the remarkable thing of RecaPtcha system is that the crowd does not charge any money for their effort in completing the task. Yet another significant crowd computing marketplace is Amazon Mechanical Turk(MTurk). It has Provision for API's for developers so that the developers can directly connect to MTurk servers to efficiently finish the computing task. MTurk largely popular due to large number of members ,high-diversity of member's knowledge , locations ,skills along with low-cost labors. The rapid cycle of deployment and testing also matters. Crowd-computing applications should solve problems which have following characteristics. First of all problem divisibility. The problem should be divisible into non dependant sub Problems. They should not change with time. The sub Problems when solved should result into sub-solution which should be in a verifiable state. There should be a strategy that should b efficient enough to integrate sub solutions into solution to the original-Problem. second characteristic is cost of crowd-computing should be reasonable . A crowd size limited to few users who are expert in solving a specific computing problem will increase the cost inevitably. Hence this characteristic should be kept in mind while modelling a crowd-computing scenario . Numerous applications in recent years used this crowed sourcing-approach : Music similarity evaluation , Improvement in text - writing ,Measurement of relevance of results by search engines, Construction of training datasets of audio ,video, images for classic AI systems. There are 3 design steps for designing a crowd-computing system. They are : defining system overall strategy , generation of sub problems designing & optimising process . In crowd-computing, it's a good Practise that users compete to improve the sub-problems ,thereby leading to generation of optimised sub solutions. For the designers one crucial task is Problem (or) sub Problem assignment depending on two types of computing systems . First is for active systems , each user can be modeled by its history upon which types of sub Problem can be assigned to that users. Whereas passive systems there is no task assignment . Users select task based on their skill set and time available to solve that task . Hence , criteria to select a task plays an important role. The following shows crowd computing model.

Human crowd workers have more knowledge base and consciousness than machines which gives them an edge over machines . Also , it has been experimentally Proved that human beings can in parallel learn algorithms than machine . A machine handles sequential logic as well as the operating system should be changed in a computer which is cost efficient for solving a big computing challenge

Robust Fault-Tolerant Training Strategy Using Neural Network To Perform Functional Testing Of Software

Article PDF :

Article Type :

Original Article

Author :

Manas Kumar Yogi, L. Yamuna

Volume :

9

Issue :

3

Abstract :

This paper is intended to introduce an efficient as well as robust training mechanism for a neural network which can be used for testing the functionality of software. The traditional setup of neural network architecture is used constituting the two phases -training phase and evaluation phase. The input test cases are to be trained in first phase and consequently they behave like normal test cases to predict the output as untrained test cases. The test oracle measures the deviation between the outputs of untrained test cases with trained test cases and authorizes a final decision. Our framework can be applied to systems where number of test cases outnumbers the functionalities or the system under test is too complex. It can also be applied to the test case development when the modules of a system become tedious after modification.

Keyword :

ATNN, Fault, Neural, Test Case, Test Oracle

A Survey of Cyber foraging systems: Open Issues, Research Challenges

June 2017

Authors:

Manas Kumar

Darapu Uma

Abstract

This paper presents a survey on current applications which practice the pervasive mechanism of cyber foraging. The applications include the LOCUSTS framework, Slingshot, Pupetter. This applications advocated the operating principle of task sharing among resource deficient mobile devices. These applications face some design issues for providing efficient performance like task distribution and task migration apart from the security aspect. The general operating mechanism of the cyber foraging technique are also discussed upon and the design options to leverage the throughput of the inherent mechanism is also represented in a suitable way.

A Improved Software Architecture For Supervising The Fidelity Of Distributed Systems

Authors:

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Pragati Engineering College

References (9)

Abstract

This paper represents the challenge of software architecture according to fidelity prediction. In a distributed computing environment a improved statistical model is used for unearthing the most suitable algorithms corresponding to performance needs for each specific software application. The proposed technique is based on a variant chain of automatic data collection, which has provided us the possibility to adjust, during the execution, the mechanism of fault management. We propose a monitoring scheme with high degree of dynamism and docility . In this fidelity scheme we define a specific library for file accesses and conversation so as to keep track of files and communication usage. The technique imbibes a self-contained architecture for distributed systems, which allows us to supervise the collection of the statistical data and to support the execution of the applications in a non-reliable operational environment. The main benefit of the proposed technique is that it provides us the chance to constitute the software architecture as per the most up to date requirements.

Novel Perspective on Security And Privacy Mechanisms in Fog Computing

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Abstract— This paper sincerely attempts to summarize the current technological perspective of security challenges posed in the domain of fog computing. Our paper discusses the operational intricacies of security as well as privacy concern due to the highly flexible nature of fog nodes. In such an dynamic nature providing sustainable security requires quite a effort while designing the security principles. We have presented a novel review of existing techniques and also advocated a modified approach for access control. We have additionally presented the mechanism of authentication and privacy control for the fog users by deployment of trust management system.

Keywords—, Access Control, Authentication, Fog, IOT, Privacy, Security

I. INTRODUCTION

Fog computing is taken into account as associate extension of the cloud computing paradigm from the core of network to the sting of the network. it's an extremely virtualized platform that has computation, storage, and networking services between end devices and traditional cloud servers. Fog computing is defined as "a situation wherever a large range of different (wireless and generally autonomous) omnipresent and decentralized devices communicate and cooperate among them and with the network to perform storage and process tasks without the involvement of third parties. These tasks are for supporting basic network functions or new services and applications that run during a sandboxed atmosphere. Users leasing a part of their devices to host these services get incentives for doing therefore. Though this definition continues to be debatable, we have a tendency to powerfully agree that we want a definition to differ fog computing from connected technologies since

anyone of these underlying techniques could cover a false read on fog computing.

Fig. 1. Representing cloud and fog

Due to set at the edge of net, fog network is heterogeneous. The duty of fog network is to attach each element of the fog. However, managing such a network, maintaining connection and providing services upon that, particularly within the eventualities of the internet of Things (IoT) at massive scale, isn't simple.

II.SECURITY ASPECTS IN FOG

A. Authentication

Current trusty Platform Modules (TPMs) are ill suited for cross-device situations in trustworthy mobile applications as they hinder the seamless sharing of information across multiple devices.By design, TPMs provide a hardware root of-trust certain to one, standalone device. TPMs return equipped with secret writing keys whose private parts never leave the TPM hardware chip, reducing the chance those keys could also be compromised. the strain between single-device TPM guarantees and also the would like for cross-device sharing makes it tough for trustworthy applications to deal with multi-device eventualities. This paper reviews one, easy style amendment to the TPM,

Mist Computing: Principles, Trends and Future Direction

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Abstract — *In this paper we present the novel idea of computing near the edge of IOT architecture which enhances the inherent efficiency while computing complex applications. This concept is termed as mist computing. We believe this computing will bring about an massive revolution in future computing technologies. instead of thrusting the control responsibility to gateways while data transmission the control is decentralised to end nodes which decrease the communicational delay of the network thereby increasing the throughput.*

Keywords— *Mist, IOT, Gateway, Thinnect, Situation Aware, Edge Computing*

I. INTRODUCTION (SIZE 10 & BOLD)

Scaling IOT to 75 billion devices is quite a handful of challenges. One way is to utilise the computing power at the edge of the network. Secondly, for the sake of minimising communication, develop measures to contain the computation at the edge of the network. Last but not the least solutions to scaling must e self managing ad self configuring. MIST computing helps in building large scale IOT systems. The IOT is regarded to have very small things at the very edge of the network like little power, limited RAM,ROM, limited communication bandwidth and not surprisingly may organisations refrain themselves from facing this challenges. The following table indicates the current utilization of bandwidth by IOT devices:

TABLE I

	CSR mesh (QUALCOMM) Single hop configuration	Zigbee Pro(si labs) 16 node network with high load	Thinnect mist 16 node network with high load
Average effective data rate (k/sec)	0.017	0.05	0.1
Duty cycle	50%	100%	20%

Even though the computing power is much more than what we had 10-15 years ago, the communication power is even much more than the computing power. We need 5 times more power to communicate with wireless devices. In case of a battery powered mesh network we have to communicate as little as possible to reduce the power consumption. For operation of IOT devices on the edge we need program memory size of 256kb and bandwidth of 250 Kbit/seconds. We infer easily that edge of IOT is not a scaled down version of the internet. So, while designing such a architecture we must account our needs before making the final design. The basic aim of mist computing is to rig computing to the very edge of the network ,i.e., sensors and actuators.IOT devices should not depend on internet as in real life ,physical systems won't be functional if there is a communication failure between the cloud ad the IOT device. The IOT devices should not have the capability to use the local intelligence using the guidelines that have been provided to act in case of a failure.

II. GUIDING PRINCIPLES OF MIST COMPUTING

2.1 Network must provide information but not simply data.

2.2 The network should deliver only information that has been requested and only when it has been requested.

2.3 Dynamic creation of a system based on information needs with end devices working together using a subscriber provider model.

2.4 Devices must be situation aware ,they must adapt to the information needs and the network configuration. We should not have static bindings rules for device and data providers. The devices must dynamically discover the data providers and execute the application.

A. *Making Things Aware Of The Situation*:

. The cloud and fog have awareness of the user needs and the global situation whereas the mist has awareness o the physical environment and the local situation, so together the responsibility is to execute an IOT application. In order to achieve this the global situation must be communicated to the edge devices and the edge devices must e ale to understand what does or how they need to behave in certain situations. The IOT application then actually spans from the very end of the edge network to the cloud. there are notable differences between edge computing ad mist computing. In edge computing, functionality is fixed,

A hybrid training mechanism for applying neural networks to Web-based applications

Authors:

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Maiga Chang
Athabasca University

Yen-Teh Hsia
Chung Yuan Christian University

Citations (4)   References (13)

Abstract

This paper proposes a hybrid training neural network and applying it to the accuracy counter (AC) developed previously. The neural network is used for detecting the cheating model for abnormal browsing behaviors performed by users in the conflicting environment. The most significant issue, training, should be taken into consideration while we are applying the neural network to Web-based applications such as the accuracy counter. Therefore, we design a hybrid Web based training mechanism for neural networks to deal with this kind of training problem. Finally, we also find out that the AC's block rate for detecting the abnormal browsing behaviors is increasing from 61% (rule-based) to 76% (neural networks with hybrid training mechanism) in the efficient and acceptable training period.

International Journal of Computer Trends and Technology

Future of Software Testing: Novel Perspective, Challenges

Future of Software Testing: Novel Perspective, Challenges

Citation

Abstract

Software testing is part of the software development which ensures software functions in the intended way of the client. Software testing depends on how well we are practicing the principles of software testing currently. Formation of testing in Modern era is becoming popular day by day. Therefore, software testing engineers are trying to efficiently convert the manual test effort into automation test report. This challenge is difficult due to various factors which we are presenting in this paper. This paper is a novel afford to get software testing practitioners regarding path they follow to overcome the challenges of software testing. Our paper is a sincere advice to envision the future of software testing which is highly dependent on current software testing practices.

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Keywords

testing, risk, automation, exploratory.

Future of Software Testing: Novel Perspective, Challenges

Future of Software Testing: Novel Perspective, Challenges

Citation

Manas Kumar Yogi, G.Kumari, Himatej S R Y, Ch V S G Manikanta "Future of Software Testing: Novel Perspective, Challenges". International Journal of Computer Trends and Technology (IJCTT) V55(1):4-6, January 2018. ISSN:2231-2803. www.ijcttjournal.org. Published by Seventh Sense Research Group.

Abstract

Software testing is part of the software development which ensures software functions in the intended way of the client. Software testing depends on how well we are practicing the principles of software testing currently. Formation of testing in Modern era is becoming popular day by day. Therefore, software testing engineers are trying to efficiently convert the manual test effort into automation test report. This challenge is difficult due to various factors which we are presenting in this paper. This paper is a novel afford to get software testing practitioners regarding path they follow to overcome the challenges of software testing. Our paper is a sincere advice to envision the future of software testing which is highly dependent on current software testing practices.

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Keywords

testing, risk, automation, exploratory.

Ambient Intelligence: Principles, Current Trends, Future Directions

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Abstract— In this paper we have presented the involved principles, trends, future directions of ambient intelligence. in the first section we have elucidated concept of ambient intelligence with the prevalent need of intelligent communication with the help of designing knowledgeable entities. We have presented the design process of I-blocks with its inherent merits. we have also discussed the various design concepts of ambient intelligence objects. Finally, we presented the current research directions to motivate societal needs of human beings.

Keywords— ambient, Computer Vision, intelligence, smart, ubiquitous

I. INTRODUCTION

This introductory paper describes Ambient Intelligence *(AmI)* from the perspectives of researchers working in the field of Artificial Intelligence and Computer Vision. It is for the reader to get acquainted with some of the ideas .That will be explored in greater detail in the following content .Ambient Intelligence is a term that was introduced by the European community to identify a paradigm to equip environments with advanced technology and computing to create an ergonomic space for the occupant user. Here the term ergonomic is used in a broad sense, encompassing both better living environment, secure space, but also an active, almost living space around us; capable of aiding us with daily chores and professional duties. Later on in this paper you will be able to see examples of enhanced homes for the elderly, intelligent buildings, devices built for education and entertainment and conventional visual surveillance systems, easily portable to other domains of application, such as the training of professionals.

The AmI paradigm can be realized only through a number of technologies, all involving modern computing hardware and software. In particular, an AmI system requires the use of distributed sensors and actuators to create a pervasive technological layer, able to interact transparently with a user, either passively by observing and trying to interpret what the user actions and intentions are, but also actively, by learning the preferences of the user and adapting the system parameters to improve the quality of life and work of the occupant.

The Essex approach-The Department of Computer Science at Essex University carries out research in the field of AmI. Their approach is focused on the implementation of AmI as indoors smart environments. In particular, state of the art Artificial Intelligence techniques are employed in the implementation of a futuristic *IntelligentDormitory* (iDorm). The following contents will describe their approach and some of the employed technology. The main idea here is to illustrate a concrete example of AmI put into practice with success. Later on in this paper you will be able to understand how Computer Vision could enhance the iDorm and typical AmI enabled smart environments.

II. CURRENT TRENDS

Ambient Intelligence: the contribution of different disciplines

Ambient Intelligence represents a vision of the future where people are surrounded by electronic artifacts and environments, sensitive and responsive. Ambientintelligence technologies are expected to combine concepts of ubiquitouscomputing and intelligent systems putting humans in the centre of technologicaldevelopments. This represents a long-term objective for European researchbringing together researchers across multiple disciplines like computer science, electronics and mechanical engineering, design, architecture, social sciences,software engineering. Key concepts of ambient intelligence are:

A. *Ubiquitous Computing*: that is wired, wireless and ad-hoc networkingthat exploit highly portable or else numerous, very-low-cost computingdevices; discovery mechanisms, software architectures, system integrationand prototyping, portable devices;

Research Roadmap for IoT Forensics

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ABSTRACT

With the advent of IOT ,most of modern technological devices consume and dissipate data at a level never imagined .It has been admitted by IOT researchers that usage of data trails can be used to provide evidence in court of law for safeguarding the common man's interests. our paper is a sincere effort to throw light on current principles applied for IOT forensics as well as difficulties faced by researchers in this field. This paper is a readymade guide for understanding the crucial research challenges lying ahead in the field of IoT forensics. In this paper we present the issues pertaining to IOT forensics which force us to think about leveraging the current techniques used in digital forensics, cloud forensics, network forensics.

Keywords : IoT, Digital Forensics, Cloud Forensics , anonymisation techniques, Digital Investigations

I. INTRODUCTION

What is IoT

Imagine a world in which every device in the home, workplace and car are connected. A world where the lights automatically turn on when the car approaches the driveway, the coffee starts brewing when the morning alarm goes off and the front door automatically unlocks when approached by a member of the household, but stays locked when a stranger arrives on the front step. That is the type of world the Internet of Things can create.

The Internet of things (IoT) is the inter-networking of physical devices, vehicles (also referred to as "connected devices" and "smart devices"), buildings, and other items—embedded with electronics, software, sensors, actuators, and network connectivity that enable these objects to collect and exchange data.

Internet of Things (IoT) is an ecosystem of connected physical objects that are accessible through the internet. The 'thing' in IoT could be a person with a heart monitor or an automobile with built-in-sensors, i.e. objects that have been assigned an IP address and have the ability to collect and transfer data over a network without manual assistance or intervention. The embedded technology in the objects helps them to interact with internal states or the external environment, which in turn affects the decisions taken.

IoT is to offers advanced connectivity of devices, systems, and services that goes beyond machine-to-machine (M2M) communications and covers a variety of protocols, domains, and applications. The interconnection of these embedded devices (including smart objects), is expected to usher in automation in nearly all fields, while also enabling advanced applications like a smart grid, and expanding to areas such as smart cities.

Currently, the focus in the IoT domain centers on its benefits and applications as well as security and privacy issues that apply. There is little by way of a dedicated incident response methodology for Digital Forensics (DF)

Fluid computing: Principles, Applications, Future Directions

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ABSTRACT

Pervasive computing is the next level of computing in modern technological era where user is much bothered about the flexibility of working on an application without having to bother about the nature of devices. The user may change the devices according to his portable needs and the handoff of the application state must be near perfect. To achieve this near perfect synchronization the concept of fluid computing and its implementation resulting into a robust middle architecture forms the main crux of our paper. We present the basic fundamentals needed to under the fluid computing concept and its applications which are already sparking off an revolution in wireless technological world.

Keywords: Batch mode, Fluid Computing, Handoff, Trickle mode, Synchronization

I. INTRODUCTION

As the advent of distributed systems brings about never imagined advancements still mankind hopes for a better technology at its dispense. Few years back cloud computing paradigm had taken the whole world by storm with its infinite ability it provides various services on demand. With its boon for virtualization a well secured architecture was put into practice. the essential properties of cloud namely on-demand self-service, broad network access, resources-pooling, rapid elasticity, measured services more talking point of every potential cloud user But due to security issues while cloud data storage a shift to new technology paradigm called as "fog computing; came into existence. In fog computing also known as edge computing, proximity of data to end users is more .It is medium in terms of computing power. as said the inherent scope of development still exists which has given birth to mist computing which refers to a lightweight and primitive form of computing power which resides directly inside the network fabric consisting of microcomputer and micro controllers to feed into fog nodes thus the fog nodes are responsible to inject the same forward cloud computing platform. Mist, fog computing are emerging as contenders against cloud in terms of connectivity bandwidth, latency, cost & security challenges imposed by cloud architectures. So far everything was seemingly alright but human nature of operational simplicity forced, towards a principle of distributed computing architecture where design was to achieve most cost effective, reliable, scalable architecture which was never possible before, The operating technology was coined a term "fluid" and fluid computing become famous from last couple of years.

II. LITERATURE SURVEY

2.1 Chisel

Adaptable software for varying contexts was a challenge met by researches when they produced a dynamic framework named chisel[1] .chisel worked on the principle of adaptation of changing work execution environmental taking inputs

A Future Perspective of Blockchain Technology, It's Design And Implementations

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Abstract: Bitcoin is the predecessor for the blockchain technolog that has gain more attention in recent times.Blockchain serves as an immutable ledger which allows transactions take place in a decentralized manner. Blockchain applications are numerous including Internet of Things (IoT), eliminating trusted third parties, digital advertisement and so on. However there are some problems still arise with this technology which slowdown the growth of this like security and scalability. This paper presents blockchain technology architectures, algorithms and latest trends and it's future involvement in its growth and technical challenges.

Keywords—Blockchain, decentralization, scalability, security, Internet of Things

I. INTRODUCTION

In current situation cryptocurrency has become a buzzword in both industry and academia and Bitcoin was the most popular and successful cryptocurrency with a huge capital market of 10 billion dollors in 2016[1]. This network can eliminate any third party and the Building block for this bitcoin is Blockchain.Blockchain could be regarded as a public ledger and all committed transactions are stored in a list of blocks.This chaingrows as new blocks are appended to it continuously.cryptography and distributed algorithms have been implemented for user security and ledger consistency. Blockchain allows the users to do payment [3],[4] without any intervention of bank , financial institutions or any intermediary and it is used in various financial services like online payment[3] ,digital assets. It can also be usede in Internet of Things (IoT) [7] and public services [9].Blockchain is immutable. Transaction cannot be tampered once it is packed into the blockchain. Businesses that require high reliability and honesty can use blockchain to attract customers. Besides, blockchain is distributed and can avoid the single point of failure situation. Although blockchain has more potentiality over future internet growth, it has some limits like scalability where Bitcoin block size is 1 MB, subsequently bitcoin network is restricted to have only seven transactinons oer second which is incapable in dealing with frequency trading. However larger blocks mean larger storage space and reduced movement in the network. Miners could also have larger revenue than their actual fair through selfish mining strategy [10]. So solutions for these problems need to be put forward to fix them. Current algorithms like proof of work or proof of stake are facing some serious problems, There is a lot of literature on blockchain from various sources, such as blogs, wikis, forum posts, codes, conference proceedings and journal articles. Tschorsch et al. [12] made a technical survey about decentralized digital currencies including Bitcoin. Compared to [12], our paper focuses on blockchain technology

A Future Perspective of Blockchain Technology, It's Design And Implementations

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A New Makespan Estimation Model for Scientific Workflows on Heterogeneous Processing Systems

Citation

D Sirisha and G Vijayakumari. A New Makespan Estimation Model for Scientific Workflows on Heterogeneous Processing Systems. *International Journal of Computer Applications* 179(17):18-26, February 2018. BibTeX

Abstract

Scientific workflows epitomizing computation-intensive applications demand heterogeneous processing resources for attaining high performance. Generally, optimal scheduling of the tasks in workflow is well-acknowledged NP-complete problem. In the present work, a new makespan estimation model is proposed to estimate the bounds on the makespan of the workflows using minimal information. The performance of the proposed estimation model is evaluated using four scientific workflows and the estimation of the makespan computed by the model is compared with the actual makespan generated by the most-cited heuristic scheduling algorithms devised for heterogeneous processing systems. The experimental results revealed that the proposed estimation model is effective and can precisely estimate the makespan of the workflows with an error of over 10% and 26% for computation-intensive and data-intensive workflows respectively.

Machine Translation from English to Hindi

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Abstract— Statistics show that only ten percent of Indian population is aware of English language to the extent that they can speak and understand spoken English. Since a majority of the population do not have working knowledge of English and since English is world communication medium it becomes imperative to understand the current happenings in the world. A way to achieve this to be able to translate English language into Hindi which may be used to bridge the gap. Many research organizations in India and abroad have started developing translating systems for translating English into various Indian languages. Machine translation, as the name says, is the process of translating using a machine, such as a computer.

The proposed system is direct translation system. It is based on the bilingual dictionaries. In the proposed system, the source language sentence is given as input. The processing involves splitting sentence into words and looking up in the dictionary for translation. If the word is not available in the dictionary, then transliteration is done.

Keywords— Machine Translation, Transliteration, Morphological, statistical machine translation, communication.

I. INTRODUCTION

Machine translation can be defined as translation from one language to another language. And also it is a subfield of computational linguistics it uses software to translate text or speech from one language to another language. It is the part of natural language processing.

A. Machine Translation (MT) in India

MT is important technology for localization and particularly relevant in linguistically diverse like India. Human translation in India is rich and important and it works on different fields like arts, science, and philosophy. It finds so many applications mainly in the administration, media, education and business.

It helps people to understand language very easily. The language that is to be translated is called source language, after translation the obtained language is called target language.

B. Why MT is popular in India?

India has linguistically rich area. It has twenty two constitutional languages which are written in ten different scripts. Hindi is the official language of the union. However, English is very widely used in the media, commerce, science, technology, and education. India's national language is Hindi. Sixty to seventy percent of the population understands Hindi and five percent of the population speaks English. So, in India there is big market for translation from English to Hindi.

As is clear, the market is the largest for translation from English to Indian languages, primarily Hindi. Hence English to Hindi translation systems have great demand. In English to Hindi machine translation system, English is

A Hybrid Methodology for Multi-owner Information Sharing in Untrusted Cloud Using Secure Mona Convention

Banda S. N. V. Ramanamurthy ✉ & D. Sirisha

Abstract

Sharing social event asset among cloud clients is a significant impact, so appropriated figuring gives a preservationist and convincing course of action. In perspective of proceeds with change of sharing information, interest in a multi-proprietor way to an untrusted cloud is still a testing issue. Here in this paper, we propose a safe multi-proprietor information sharing arrangement, for dynamic group in the cloud. By giving social affair mark and component show encryption methods, any cloud clients can protectively confer information to others. By then a meanwhile, the limit overhead and encryption count cost of the arrangement are free with the amount of denied clients. In other hand, we explore the security of this arrangement with intensive confirmations. OTP (One-Time Password) is one of the least complex and most prevalent types of confirmation that can be utilized for securing access to accounts. OTP is regularly alluded to as a safe and more grounded types of confirmation, and tolerating them to introduce over different machines. We give a numerous levels of security to share information among multi-proprietor process. Initially the client chooses the pre-chosen picture to login. At that point chooses a picture from the matrix of pictures. By utilizing this, the OTP is produced consequently and sent to comparing email account.

Keywords

Towards Efficient Bounds on Completion Time and Resource Provisioning for Scheduling Workflows on Heterogeneous Processing Systems

Authors: G. Vijayakumari, D. Sirisha Authors Info & Claims
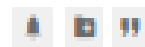
Abstract

Compute intensive applications featured as workflows necessitate Heterogeneous Processing Systems HPS for attaining high performance to minimize the turnaround time. Efficient scheduling of the workflow tasks is paramount to attain higher potentials of HPS and is a challenging NP-Complete problem. In the present work, Branch and Bound BnB strategy is applied to optimally schedule the workflow tasks. The proposed bounds are tighter, simpler and less complex than the existing bounds and the upper bound is closer to the exact solution. Moreover, the bounds on the resource provisioning are devised to execute the workflows in the minimum possible time and optimally utilize the resources. The performance of the proposed BnB strategy is evaluated on a suite of benchmark workflows. The experimental results reveal that the proposed BnB strategy improved the optimal solutions compared to the existing heuristic scheduling algorithms for more than 20 percent of the cases and generated better schedules over 7 percent for 82.6 percent of the cases.

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DESIGN AND CFD ANALYSIS OF DIFFERENT PIPE JOINTS USED IN WATER SUPPLY INDUTRIES

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ABSTRACT

Pipe Distribution network system is very common in industries such as water supply industry, nuclear power plant industry, chemical industry, water treatments plants etc, where the fluid or gases to be transported from one location to other location. The pressure loss may vary depending on the type of components used in the total network, material of the pipe, the fluid that is being transported through the network and pipe fitting. The analysis of pipe network is very important in engineering point of view. A lot of engineering problem dealt with it.. Fittings are used in pipe and plumbing systems to connect straight pipe or tubing sections, to adapt to different sizes or shapes, and for other purposes, such as regulating or measuring fluid flow. Most commonly used fitting or joints in industries are Elbow joint, T-joint and straight joint .One problem facing today's water supply industries are flow-accelerated corrosion and erosion in pipe joints. The model geometry of three different pipe joints i.e. Elbow, T section and straight joints are created by using solidworks 2016 software and the simulations are being performed using the ANSYS CFD FLUENT module after mesh were created using the ANSYS software. This report documents the results of the simulations that have been made to date; baseline results employing the RNG k-ε turbulence model are presented. Pressure, velocity, shear stress on wall, turbulent kinetic energy inner surface of elbow joint, straight joint & T - joint are shown in figures, and there values are noted and tabulated.. Plots of the velocities, pressure field, wall shear stress, and turbulent kinetic energy adjacent to the wall are shown within the three different joints section.

Keywords: *ANSYS CFD FLUENT, ANSYS Software, Pipe.*

1. INTRODUCTION:

The **water Industry** provides drinking water and waste water services (including sewage treatment) to residential, commercial, and industrial sectors of the economy, it total distribution system depends on piping and pipe fitting. The pipes are used for transporting various fluids like water, steam, different type of gases, oil and other chemical with or without pressure from one place to another place. The pipe material used in pipe network system depending on the application. Cast iron, wrought iron, steel, and brass are the material generally used for pipes in engineering practice. The fluid to be conveyed in pipes whose temperature to be varied but the annual average temperature is 35 °C while the relative humidity varies generally from 70% during the day to 90% at night. The temperature of potable water to be conveyed in the pipelines will be about 30° C. The pipes used in petroleum industry are generally seamless pipes made of heat resistance chrome molybdenum alloy steel. Such type of pipe can resist pressure more than 4Nmm2 and temperatures greater than 440.c.

The pipes for a particular use cannot be made of desired length. Therefore pipes of standard length are taken and joined

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165

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ABSTRACT

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The pipes for a particular use cannot be made of desired length. Therefore pipes of standard length are taken and joined

DESIGN AND STRESS ANALYSIS OF HIGH PRESSURE ACCUMULATOR

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Abstract - The Main Objective of the project is to reduce to use of the pump for the descaling purposes thus the accumulator is used instead of pumps the main purpose of the accumulator is to store the 250 bar water with pressurized air, whenever we required high volume and high pressure water it will deliver from accumulator to descaling system. From this reason the designing of the high pressure accumulator as to be done. By this we can save the buying high volume & high pressure pumps, so that we can save the 160KW power 3 times and also cost can be reduce by using this mechanism.

Keywords: *Designing of accumulator, stress finding for different thickness (20mm, 30mm, 35mm, and 55mm), strain and displacement.*

I.   INTRODUCTION

A hydraulic accumulator is a device in which potential energy is stored in the form of a compressed gas or spring, or by a raised weight to be used to exert a force against a relatively incompressible fluid[2].

They are used in fluid power systems to accumulate energy and to smooth out pulsations. A hydraulic system utilizing an accumulator can use a smaller fluid pump since the accumulator stores energy from the pump during low demand periods. This energy is available for instantaneous use, released upon demand at a rate many times greater than could be supplied by the pump alone.

Accumulators can also act as surge or pulsation absorbers, much as an air dome is used on pulsating piston or rotary pumps. They will cushion hydraulic hammer, reducing shocks caused by rapid operation or sudden starting and stopping of power cylinders in a hydraulic circuit.

A. Background & Motivation

Before thought of designing an accumulator, As they was using direct descaling in which they didn't get that much of flow i.e.330lpm.I thought of storing that in a we vessel so that we can get a desired pressure as well as flow. Even though we were facing the same problem. Finally we thought of designing the hydraulic accumulator in which will get a flow of 330lpm with a pressure of 250-300bar without using additional pump which might reduce the additional pump setup cost ,operating cost as well as maintenance cost[1]. In addition to this they have to spend man power and money for maintenance of separate pumping system in operation, this found them for laborious job.

As per the study we had gone with the descaling process which will be required in most of the steel plant so as to remove the layer of iron-oxide from the billets/slab. The oxidation of slabs in the reheating furnace is the first and determining process of the scaling of hot rolled flat products. The structure of the scale formed during reheating and the width of the internal oxidation zone are not only influenced by the heating parameters, but also by the chemical composition of the steel.

The prime scale formed on the slab has to be efficiently removed by hydraulic descaling. Previous studies showed that, under mechanical descaling conditions, the entanglement that arose at the steel-scale interface was in fact effective to maintain steel-scale adhesion. Descaling proceeds by fracture along chromite layers, which formed on the austenite grain boundaries; for this steel, the extend of descaling depended most strongly on austenite grain structure and the presence of un oxidized metal tendrils at the interface and not primarily on the conditions in the reheating furnace.

Investigation on the Effect of Corrosion on Mechanical Properties of Al 6061 & Al 7075

Sri Avinash Gudimetla, S Sambhu Prasad

Abstract

In this thesis we are going to analyze the Aluminium alloys of series Al 6061 and AL 7075 by conducting mechanical tests. And the mechan differences are spotted in the corrosion test. ASTM Corrosion Testing is provided, including the ASTM B117 Salt Spray Test. For the initial v and later hardness test is carried out for testing the hardness of the materials which is better. Here even the corrosion timing is also varied the 10, 20, 30 hours for the sample pieces. After that we have verified with the hardness test machine for the strength of the material using tester machine. 3 samples have been taken for each alloy, so totally 6 samples have been tested and the results are verified.

Design and Experimental Investigation on Tensile Strength Properties Using Different Forms of Layers for Epoxy Materials

S Sambhu Prasad, Sri Avinash Gudimetla

Abstract

In aeronautical, marine and automobile industries the use of composites has increased due to their high stiffness and strength-to-weight ratios long fatigue life, resistance to electrochemical corrosion and other superior material properties of composites. In this paper, the experiments of vibrational analysis are carried out using Kevlar. Samples of Kevlar composites of different layers are used in this research. composites are truly materials of future, composites will help in developing components with better fatigue life and strength also these composite components can be tailor made to match the exact requirement. In this work we are developing and studying the behaviours of two different composites (regular and hybrid), hybrid composites are those which have multiple fiber reinforced lamina in their laminate.

Configurations of the composites are as follows

E-glass/epoxy$(0)_3$, E-glass/epoxy$(0)_5$, E-glass-Kevlar/epoxy$(0)_3$, E-glass-Kevlar/epoxy$(0)_5$, E-glass/epoxy$(0)_3$(2mm – 2nd layer thickness), E-glass/epoxy$(0)_5$(2mm – 2nd & 4th layer thickness), E-glass-Kevlar/epoxy$(0)_3$(2mm – 2nd layer thickness), E-glass-Kevlar/epoxy$(0)_5$(2mm – 2nd & 4th layer thickness) in hybrid composite specimens reinforcement is changed in alternative layers.

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Design and Experimental Investigation on Tensile Strength Properties Using Different Forms of Layers for Epoxy Materials

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Design and Implementation of a Hybrid Lut/Multiplexer Architectures for Fpga

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ABSTRACT: *Hybrid configurable logic block architectures for field-programmable gate arrays that contain a mixture of lookup tables and hardened multiplexers are evaluated toward the goal of higher logic density and area reduction. Multiple hybrid configurable logic block architectures, both nonfracturable and fracturable with varying MUX:LUT logic element ratios are evaluated across two benchmark suites (VTR and CHStone) using a custom tool flow consisting of LegUp-HLS, Odin-II front-end synthesis, ABC logic synthesis and technology mapping, and VPR for packing, placement, routing, and architecture exploration. Technology mapping optimizations that target the proposed architectures are also implemented within ABC. Experimentally, we show that for nonfracturable architectures, without any mapper optimizations, we naturally save up to ~8% area postplace and route; both accounting for complex logic block and routing area while maintaining mapping depth. With architecture-aware technology mapper optimizations in ABC, additional area is saved, post-place-and-route. For fracturable architectures, experiments show that only marginal gains are seen after place-and-route up to ~2%. For both nonfracturable and fracturable architectures, we see minimal impact on timing performance for the architectures with best area-efficiency.*

I.INTRODUCTION

Throughout the history of field-programmable gate arrays (FPGAs), lookup tables (LUTs) have been the primary logic element (LE) used to realize combinational logic. A K-input LUT is generic and very flexible—able to implement any K -input Boolean function. The use of LUTs simplifies technology mapping as the problem is reduced to a graph covering problem. However, an exponential area price is paid as larger LUTs are considered. The value of K between 4 and 6 is typically seen in industry and academia, and this range has been demonstrated to offer a good area/performance compromise [4], [5]. Recently, a number of other works have explored alternative FPGA LE architectures for performance improvement [6]–[10] to close the large gap between FPGAs and application-specific integrated circuits (ASICs) [11]. In this paper, we propose incorporating (some) hardened multiplexers (MUXs) in the FPGA logic blocks as a means of increasing silicon area efficiency and logic density. The MUX-based logic blocks for the FPGAs have seen success in early commercial architectures, such as the Actel ACT-1/2/3 architectures, and efficient mapping to these structures has been studied [12] in the early 1990s.

How ever, their use in commercial chips has waned, perhaps partly due to the ease with which logic functions can be mapped into LUTs, simplifying the entire

Text Independent Speaker Identification using Integrated Independent Component Analysis with Generalized Gaussian Mixture Model

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Dr.K. Srinivasa Rao

Department of statistics, Andhra University Visakhapatnam, India

Abstract - **Recently much work has been reported in literature regarding Text Independent speaker identification models. Sailaja et al (2010)[34] has developed a Text Independent speaker identification model assuming that the speech spectra of each individual speaker can be modeled by Mel frequency cepstral coefficient and Generalized Gaussian mixture model. The limitation of this model is the feature vectors (Mel frequency cepstral coefficients) are high in dimension and assumed to be independent. But feature represented by MFCC's are dependent and chopping some of the MFCC's will bring falsification in the model. Hence, in this paper a new and novel Text Independent speaker identification model is developed by integrating MFCC's with Independent component analysis(ICA) for obtaining independency and to achieve low dimensionality in feature vector extraction. Assuming that the new feature vectors follows a Generalized Gaussian Mixture Model (GGMM), the model parameters are estimated by using EM algorithm. A Bayesian classifier is used to identify each speaker. The experimental result with 50 speaker's data base reveals that the proposed procedure outperforms the existing methods.**

Keywords - Independent component analysis; Generalized Gaussian Mixture Model; Mel frequency cepstral coefficients; Bayesian classifier; EM algorithm.

I. INTRODUCTION

The growing need for automation in complex work environments and the increased need for voice operated services in many commercial areas have motivated the present work. While many existing systems for speaker identification achieve good performance in relatively constrained environments, performance invariably deteriorates in noisier environment. Speaker identification system is the process of selecting the best matched speaker among the enrolled speakers, with features extracted from speech signals.

Many techniques involving statistical or probabilistic approaches have been applied to speaker specific speech patterns (Leena Mary and Yegnanarayana (2008), Jyoti et al (2011)) [22] [18]. Several methods were employed to separate mixed signals known as 'Blind Source Signals' (BSS) [13]. The term blind refers to the fact that the method of combination and source signal characteristics are unknown, so BSS permits a wide range of signals as input.

Text independent speaker identification system has many potential applications like security control, telephone banking, information retrieval systems, speech and gender recognition systems, etc. Speaker identification system involves two parts: front-end (feature extractions) and back-end (actual recognition). These system use processed form of speech signals instead of using raw speech signals as it is obtained. This is to reduce the time consumed in identifying the speaker and to make the process easy, by reducing the data stream and exploiting its advantage of being redundant. Computation of cepstral coefficients using preprocessing and feature extraction phases plays a major role in text independent speaker identification systems Ning Wang et al (2010) [24].

Various studies made by Zhu, (1994) and Furui, (1982)[38][28] have also shown that computing cepstral coefficient is the best among all the parameters for any type of speaker recognition. It was proved that the performance of the speech recognizers can improve using cepstral representation of the signals for both clean and noisy speech (Erell, (1993)) [11] . Recently Reynold (1994)[5] have used Mel frequency cepstral coefficients are base line acoustic futures for text independent speaker identification and assumed that Mel frequency cepstral coefficients associated with speakers speech spectra follows a Gaussian Mixture Model.

Sailaja, Sriniva Rao and Reddy (2010a, 2010b, 2010c, 2011)[35][33][32][34] have developed and analyzed text independent speaker identification models with Mel frequency coefficients as future vectors and follow either Doubly truncated multivariate Gaussian mixture model or Generalized Gaussian mixture model. The Generalized Gaussian mixture model will also include Gaussian mixture model as particular case. In all these papers the authors considered only a first few Mel frequency cepstral coefficients and the remaining coefficients are dropped as insignificant due to high dimensionality problems. They have also assumed that the Mel frequency cepstral coefficients of each speaker speech spectra are independent.

An Investigative Study of Societal Implications of Nanotechnology

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ABSTRACT

Codes of ethics signal the seriousness of a group of professionals to think about their impacts and goals. The emergence of professional organizations and professional codes of ethics are an important part in the development of a discipline or sub-discipline. They help provide a professional identity for a field of study. Nanotechnology, being so diverse and distinct because of its diversity, should be developed to address the aims of the many other disciplines it encompasses, but this coming together of disciplines also serves to make the formation or "professionalization" of this field more difficult and complex. How should this profession develop, and what values should it hold? What is its identity? What is the aim of this new field? In other words, what should its code of ethics be? Professionals working with the nano scale need to be aware of the public's perception when they make statements.

Keywords - Nano , Nano Particles, Ethics, Societal, Nanobots

I. INTRODUCTION

Nanoethics, or the study of nanotechnology's ethical and social implications, is an emerging but controversial field. Outside of the industry and academia, most people are first introduced to nanotechnology through fictional works that posit scenarios which scientists largely reject – of self-replicating "nanobots" running amok like a pandemic virus. In the mainstream media, we are beginning to hear more reports about the risks nanotechnology poses on the environment, health and safety, with conflicting reports from within the industry. But within the nanotechnology industry, there is a strange schizophrenia afoot. We have heard about the wonderful things that nanotechnology might enable not just today's mundane products, such as better sports equipment or cosmetics, but the truly fantastic applications. Our imagination seems to be our only limit, as scientists and other experts predict such innovations as: toxin-eating nanobots; exoskeletons that enable us to leap walls in a single bound; affordable space travel for everyone; nano- factories that can make anything we want; and even near immortality. Yet nearly in the same breath, many advocates continue to deny or to ignore that nanotechnology will cause any significant disruptions or raise any serious ethical questions that we have to worry about – dismissively labeling these as "hype". But how is this possible? How can such a brave new science, one that is so full of potential that it has been called the "Next Industrial Revolution" by governments and scientists, not also impact our relationships, society, environment, economy, or even global politics in profound ways?

Abstract

Objective: The present research is aimed at the discovery and development of 1-phenyl-3-(3,4,5-trimethoxyphenyl)-1H-pyrazole derivatives as a series of novel 1, 3, 4-oxadiazoles (7a-7h) through iodine-catalyzed oxidative cyclization of the hydrazone derivatives (6a-6h) in the presence of potassium carbonate as base and DMSO as solvent in good toexcellent yields. Methods: The structures of all the newly synthesized compounds (6a-6h) and(7a-7h) were well characterized by IR, 1H NMR, 13C NMR and HRMS. Furthermore, allthe synthesized compounds (6a-6h and 7a-7h) were evaluated for their antimicrobial andanti-oxidant activities. Results: The research results revealed that the compound 6d (Z)-2-bromo-N'-((1-phenyl-3-(3, 4, 5-trimethoxyphenyl)-1H-pyrazol-4-yl) methylene) benzohydrazide) has antimicrobial potent while the synthesized compounds 6a (Z)-N'-((1-phenyl-3-(3, 4, 5-trimethoxyphenyl)-1H-pyrazol-4-yl) methylene) benzohydrazide), 6e (Z)-2, 5-dichloro-N'-((1-phenyl-3-(3, 4, 5-trimethoxyphenyl)-1H-pyrazol-4-yl) methylene) benzohydrazide), 7e (2-(2, 5-dichlorohenyl)-5-(1-phenyl-3-(3, 4, 5-trimethoxyphenyl)-1H-pyrazol-4-yl)-1, 3, 4-oxadiazole) and 7f (2-(3, 5-dichlorophenyl)-5-(1-phenyl-3-(3, 4, 5-trimethoxyphenyl)-1H-pyrazol-4-yl)-1, 3, 4-oxadiazole) exhibited strong antioxidant activity compared to the control BHT. Conclusion: The novel hydrazonessynthesized and 1, 3, 4 oxadiazole derivatives may be suggested for their establishment in chemical class of antimicrobial and antioxidant agents in new drug discovery and medicinal research. © 2018, Association of Pharmaceutical Teachers of India. All rights reserved.

On Minimal Prime filters of Almost Distributive Lattices

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Abstract

A set of equivalent conditions is derived for the class of all $\mathfrak{M}$-filters to become a sublattice of the lattice of filters. An equivalency is obtained between prime $\mathfrak{M}$-filters and minimal prime filters. Finally, the $\mathfrak{M}$-filters are characterized in terms of minimal prime filters.

AMS subject classification: 06D99, 06D15.
Keywords: Almost Distributive Lattice (ADL), $\mathfrak{M}$-filter, Ideal, Minimal prime filter, Lattice of filters.

THE SIGNIFICANT AND MEDICAL APPLICATIONS
OF GRAPHENE NANOPARTICLES

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ABSTRACT

Graphene exhibits unique 2-D structure and exceptional physical and chemical properties that lead to many potential applications. Among various applications, biomedical applications of graphene have attracted ever-increasing interests over the last three years. In this review, we present an overview of current advances in applications of graphene in biomedicine with focus on drug delivery, cancer therapy and biological imaging, together with a brief discussion on the challenges and perspectives for future research in this field.

Keywords: graphene, biomedical application, drug delivery, biosensing, bioimaging.

I. INTRODUCTION

Graphene, a novel two-dimensional nanomaterial composed of sp^2-bonded carbon atoms, possesses a number of extraordinary electronic, optical, thermal and mechanical properties With the rapid deveeolopment of synthesis and functionalization approches, graphene and its related derivatives have shown outstanding potentials in many fields, such as nanoelectronics , composite materials , energy technology (for examples, fuel cell, supercapacitor, hydrogen storage) , sensors , and catalysis , which have been summarised by several review articles .

Beyond the applications aforementioned, the biomedical application of graphene is a relative new area with significant potential. Since the seminal report on use of graphene oxide (GO) as an efficient nanocarrier for drug delivery by Dai et al. in 2008, the first study on graphene for biomedical applications, a lot of interesting work has been carried out to explore the use of graphene for widespread biomedical applications, ranging from drug/gene delivery, biological sensing and imaging, antibacterial materials, to biocompatible scaffold for cell culture. The intensive research on the bioapplications of graphene and its derivatives is due to many fascinating

THE SIGNIFICANT AND MEDICAL APPLICATIONS

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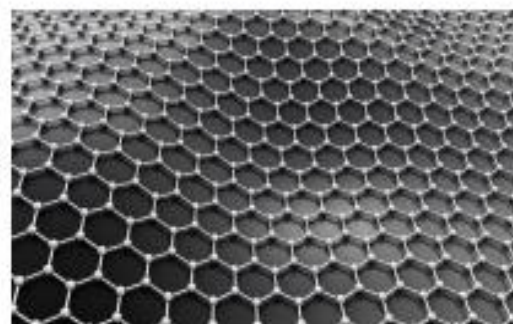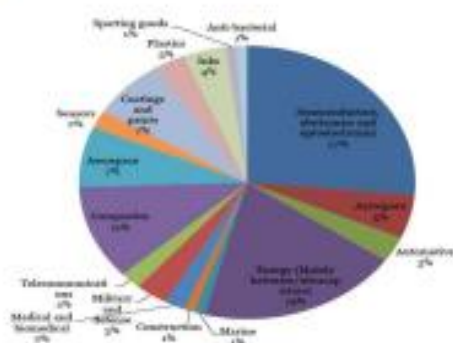[3] Assoc.Prof of Engineering Chemistry, GIET(A), Rajamahendravaram

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Graphene exhibits unique 2-D structure and exceptional physical and chemical properties that lead to many potential applications. Among various applications, biomedical applications of graphene have attracted ever-increasing interests over the last three years. In this review, we present an overview of current advances in applications of graphene in biomedicine with focus on drug delivery, cancer therapy and biological imaging, together with a brief discussion on the challenges and perspectives for future research in this field.

Keywords: graphene, biomedical application, drug delivery, biosensing, bioimaging.

I. INTRODUCTION

Graphene, a novel two-dimensional nanomaterial composed of sp^2-bonded carbon atoms, possesses a number of extraordinary electronic, optical, thermal and mechanical properties With the rapid deveeolopment of synthesis and functionalization approches, graphene and its related derivatives have shown outstanding potentials in many fields, such as nanoelectronics , composite materials , energy technology (for examples, fuel cell, supercapacitor, hydrogen storage) , sensors , and catalysis , which have been summarised by several review articles .

Beyond the applications aforementioned, the biomedical application of graphene is a relative new area with significant potential. Since the seminal report on use of graphene oxide (GO) as an efficient nanocarrier for drug delivery by Dai et al. in 2008, the first study on graphene for biomedical applications, a lot of interesting work has been carried out to explore the use of graphene for widespread biomedical applications, ranging from drug/gene delivery, biological sensing and imaging, antibacterial materials, to biocompatible scaffold for cell culture. The intensive research on the bioapplications of graphene and its derivatives is due to many fascinating

ON A CLASS OF PARA KENMOTSU MANIFOLDS

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Abstract: The object of this paper is to investigate Weyl-pseudosymmetric para-Kenmotsu manifolds and para-Kenmotsu manifolds satisfying the condition $C(X,Y).S = 0$ where $C(X,Y)$ is the Weyl conformal curvature tensor and S is the Ricci tensor of the manifold.

1. Introduction

Sato [9] defined the notions of an almost para contact Riemannian manifold. After that, Adati and Matsumoto [1] defined and studied p-Sasakian and sp-Sasakian manifolds which are regarded as a special kind of an almost contact

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I. Subordination of Women in Buck's *The Good Earth*

This study analyzes Pearl S. Buck's *The Good Earth* from the perspective of feminism. The novel is thematically and structurally dominated by the concept of patriarchy. The plot of the novel covers subjugated as well as resisting situation of O-lan. At the beginning, she internalizes the Wang's domination as values of life, however, later she raises the questions about the domination and searches the values of her individual life. In the initial stage, O-lan believes that women are for the pleasure and assistance of men. The role of women is complementary to men and they should fulfill their natural feminine functions. Identity of the women is only determined by the male identity. Women have limited role of wife, mother and mistress all of which are pleasing and beneficial to men. The brave, laborious and courteous woman like O-lan has to suffer because her identity has just been limited as traditional female role. She does not have any status in the society even though she earns many assets for Wang Lung. She is much disturbed by the cultural norms and values, too. Similarly, though Lotus and Cuckoo try to live the life of pleasure, they fail to keep up their identity because they are the concubine and slave of Wang Lung respectively and both are subordinated to a man. All these events note that the situation of O-lan is subjugated one.

O-lan is ignored. She is constantly in pain after the birth of the twins. She wishes to see her eldest son's marriage before her death. The eldest son is betrothed with the daughter of Liu, a grain merchant. After the ceremony, O-lan dies and thereafter Wang's old father also dies and are buried into the earth.

One day, Wang's eldest son suggests his father move to the vacant great house in town, a house where great family used to live. Wang agrees this idea. Wang's whole family moves to the house except his uncle and aunt. Wang's uncle's

O. Henry's "The Cop and the Anthem"

"The Cop and the Anthem" is a short story originally published in 1904 by American author William Sidney Porter, more famously known by the literary pen name **O. Her** This short story, which is told from the third-person omniscient perspective, chronic the adventures and misfortune of a homeless man named **Soapy**. Readers are introduced to Soapy's conflict at the start of the story; after Soapy acknowledges this conflict, readers can see him devise plan after plan to address his current dilemma, I despite his best efforts, he is unsuccessful at completing the task he set for himself. Ironically, when Soapy quits scheming, his initial goal is achieved.

"The Cop and the Anthem" Summary

Readers are introduced to the protagonist, Soapy, and the pre-winter New York City setting at the beginning of the story. The story opens with Soapy sitting on a bench i New York's famed Madison Square; he begins observing evidence that winter will so begin. He knows that this will cause him immediate hardship because of his homele status. So, with limited options, he concludes that this year, as in previous years, he would get arrested for guaranteed shelter at the local jail: Blackwell's Island.

Soapy devises several plans to get arrested, but none work. His plans were (in chronological order):

A Novel High Gain Closed Loop DC/DC Converter Integrating Coupled Inductor and Switched Capacitor Networks Fed DC Motor

March 2020

Authors:

Manogna Bojugu
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S Ratnakumar

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References (17)   Figures (6)

Abstract and Figures

The voltage gain of Conventional boost converter is limited due to the high current ripple, high voltage stress across active switch and diode, and low efficiency associated with large duty ratio operation. High voltage gain is required in applications, such as the renewable energy power systems with low input voltage. A high step-up voltage gain active-network converter with switched capacitor technique is proposed in this project. The proposed converter can achieve high voltage gain without extremely high duty ratio. In addition, the voltage stress of the active switches and output diodes is low. Therefore, low voltage components can be adopted to reduce the conduction loss and cost. The operating principle and steady-state analysis are discussed in detail. Based on the concept of switched-inductor and switched-capacitor, this project proposes a novel switched-capacitor-based active-network converter (SC-ANC) for high step-up conversion , which has the following advantages: high voltage-conversion ratio, low voltage stress across switches and diodes, and self-voltage balancing across the output capacitors. The operating principle and steady-state analysis are discussed

Robust Design of Multi-Machine Power System Stabilizers using Clonal Selection Algorithm

G. Naresh, M. Ramalinga Raju, M. Krishna

Abstract: Optimal design of multi-machine Power System Stabilizers (PSSs) using Artificial Immune-based optimization technique, Clonal Selection Algorithm (CSA), is presented in this paper. The proposed approach employs CSA to search for optimal parameter settings of a widely used conventional fixed-structure lead-lag PSS (CPSS). The parameters of PSS are tuned using the proposed clonal selection algorithm to simultaneously shift the undamped and lightly damped electromechanical modes of all plants to a prescribed zone in the s-plane. A multi-objective problem is formulated to optimize a composite set of objective functions comprising the damping factor and the damping ratio of lightly damped electromechanical modes. Incorporation of CSA as a derivative-free optimization technique in PSS design significantly reduces the computational burden. The main advantage of the proposed approach is its robustness to the initial parameter settings. In addition, the quality of the optimal solution does not rely on the initial guess. The performance of the proposed CSAPSSs under different loading conditions and system configurations is investigated on New England New York 16-machine 68-bus power system. The eigenvalue analysis and the nonlinear simulation results show the effectiveness of the proposed CSAPSSs over conventional power system stabilizer (CPSS) to damp out the local as well as the inter area modes of oscillations under different operating conditions.

Index Terms: Clonal selection algorithm, Damping, Electromechanical oscillations, Power system stabilizer

I. INTRODUCTION

The low-frequency oscillations in a disturbed power system grow to make the system separate and become unstable, if they are not sufficiently damped out. Modern power system utilities use, conventional power system stabilizers (PSS) as an auxiliary excitation control. PSS enhances system damping by providing supplementary stabilizing feedback signal in the excitation system [1, 2]. Larsen and Swann [3] have systematically explained the

application of conventional lead–lag PSS in power systems. The conventional PSS (CPSS) is usually designed with a fixed gain, with an aim to stabilize at the nominal operating condition. However, the inherent non-linearity and multiple operating points of a power system degrade the performance of such a fixed gains CPSS. Adaptive and variable structure control schemes are also applied [4, 5] for the design of PSS. Looking at the complexity of these designs and also at the fact that these techniques does not assure robust power system stability with varying operating conditions, Kundur et al. [6] have proposed an approach for the design of PSS for a large generating stations, wherein enhancement of overall system stability was the main criterion for the selection of PSS and automatic voltage regulator (AVR) parameters. Using conventional methods, PSS can be designed sequentially taking one electromechanical mode into consideration at a time [7]. However, the limitation of such a design is that the stabilizer designed to damp out one mode may destabilize other modes of the system. In another scheme, a gradient-based optimization method is adopted [8]. Unfortunately, the problem of PSS design is a multi-modal problem and the gradient techniques might fail by getting trapped in one of the local optima.

Recently, global optimization technique like genetic algorithm (GA), and other heuristic techniques like tabu search and simulated annealing have attracted the attention in the field of PSS parameter optimization. Unlike other techniques, GA has the ability to arrive at the global solution point swiftly, as it can handle the search space from different directions simultaneously. Crossover and mutation operators between chromosomes, makes the GA far less sensitive of being trapped in local optima. However, when the system has a highly epistatic objective function (i.e. where parameters being optimized are highly correlated), and number of parameters to be optimized is large, then GA has been reported [9] to exhibit degraded efficiency.

To overcome the drawbacks of conventional and GA based PSS design, a new Artificial Immune-based optimization technique known as Clonal Selection Algorithm is used for the PSS design. In this paper, an eigenvalue based objective function reflecting the combination of damping factor and damping ratio, are optimized for different operating conditions of the power system. It is also seen that some simple adaptive feature incorporated in the main algorithm makes its convergence even faster. It was found that the proposed technique not only optimizes the parameters faster, but also with the optimized gains the CSAPSS shows better damping performance when the system is perturbed.

Retrieval Number: E1709116517©BEIESP
Journal Website: www.ijrte.org

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Blue Eyes Intelligence Engineering
and Sciences Publication (BEIESP)
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31

PERFORMANCE ANALYSIS OF FUZZY BASED UNIFIED POWER QUALITY CONDITIONER FOR THREE PHASE FOUR WIRE DISTRIBUTION SYSTEM

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Abstract: This paper introduced a new structure of 3P4W Distribution System (DS) using fuzzy based Unified Power Quality Conditioner (UPQC). The origin of 3P4W System is from 3P3WDS. In 3P4WDS the fourth wire is the neutral terminal of series transformer. The main aim is to control the unbalanced voltages and currents on source side and load side in order to provide uniform power to nonlinear loads. Neutral currents flowing from the load towards the transformer neutral, Harmonics mitigation etc. In this paper 3P4WDS system is implemented by using two controllers i.e., Proportional Integral Controller (PIC) and Fuzzy Logic Controller (FLC) and the results are validated through Matlab/Simulink.

Index Terms -Unified Power Quality Conditioner (UPQC), Three phase four wire (3P4W), Three phase three wire (3P3W), Distribution System (DS), Proportional Integral Controller (PIC), Fuzzy Logic Controller (FLC), Power Quality (PQ), Matrix Laboratory (MATLAB), Total Harmonic Distortion (THD), Active Power Filter (APF), Voltage Source Inverter (VSI).

1. INTRODUCTION

The drastic development of semi-conductor technology the usage of sensitive equipment's is increased at each level of the power system. Sensitive equipment's needs quality of power to function properly. Hence the power engineers have been challenged to provide quality of power. In this aspect there are many power quality improvement techniques [13] designed by the researchers. One of such schemes is the usage of 3P4W-UPQC.

3P4W-DS [1]can be implemented by different ways such as running a neutral wire from the generation station, Running neutral from the star connected transformer at the distribution side etc.,. In this paper a new technique is introduced in which the system is fed by 3P3W but with the help of UPQC a series transformer connected in star passion is served as 4th wire results to the 3P4W-DS.In general 3P4Wsystem[4,7,9] faces a major problem of unbalanced loading. In this paper a new technique is introduced to mitigate the problem in which the active power of each phase is calculated individually and then distributed again to all the three phases equally.

2. APPROACH TOWARDS 3P4WDS

With the drastic industrialization the demand of power increased to a large extent. Meeting the load is one of the task with the quality of power to the consumer points from the service providers. There are some limits for the consumer regarding the THD of the current because due to the THD the power system will be polluted as a result the other consumers will be affected. Hence the usage of UPQC plays a major role in every part of power system for the enhancement of the power quality.

3P4W system can be obtained in different ways one is by running a neutral conductor from the power producing station, a neutral from the transformer connected in the star passion. To protect the sensitive loads if a system is already connected with the UPQC by 3P3W system must be upgraded to a 3P4W system to have a provision for the installation of some single phase loads. Hence there is a need for up-gradation from 3P3W system to 3P4W system.

In this paper the up-gradation of 3P4W system is clearly shown even though the supply is 3P3W the utilities are having another option to realize the 3P4W system.

Up-graded 3P4W system must consist of a series transformer for connecting one of the inverters for the controlling of source voltage. The utilization of the neutral from the star connected series transformer results to the realization to the 3P4W system from 3P3W system.

A New Multilevel Inverter Topology for Grid-Connected Photovoltaic Systems

Muhammad Bilal Satti ✉ Ⓘ ,[1] Ammar Hasan,[1] and Mian Ilyas Ahmad[2]

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Abstract

The demand for clean and sustainable energy has spurred research in all forms of renewable energy sources, including solar energy from photovoltaic systems. Grid-connected photovoltaic systems (GCPS) provide an effective solution to integrate solar energy into the existing grid. A key component of the GCPS is the inverter. The inverter can have a significant impact on the overall performance of the GCPS, including maximum power point (MPP) tracking, total harmonic distortion (THD), and efficiency. Multilevel inverters are one of the most promising classes of converters that offer a low THD. In this paper, we propose a new multilevel inverter topology with the motivation to improve all the three aforementioned aspects of performance. The proposed topology is controlled through direct model predictive control (DMPC), which is state of the art in control techniques. We compare the performance of the proposed topology with the topologies reported in literature. The proposed topology offers one of the best efficiency, MPP tracking, and voltage THD.

Analyzing the Effect of Control Modes Operation of Multiple Facts Controllers on System Performance

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References (15)

Abstract

In this paper, a method of approach is presented to obtain the controlled operation of single/multiple multi-type FACTS controllers. In this, power injection models of these FACTS controllers with necessary modifications for the controlled operations are presented. And also for enhancing the system performance and security under controlled operation, these FACTS controllers are optimally located by minimizing the severity index with regard to total power losses. UDTPSO algorithm is used to obtain optimal power flow and operation to reduce the total active power loss objective by fulfilling the system equality and inequality constraints. This method of approach is conducted on IEEE-30 standard test bus system to obtain numerical results.

PERFORMANCE AND STRENGTH EVALUATION ON SELF COMPACTING CONCRETE BY PARTIAL REPLACEMENT OF FLYASH AND GLASS POWER

Er. B. Subhan Ramji[1] & Mr. D. Varun Eswar[2]

Abstract- Self-Compacting concrete (SCC) is a high-performance concrete that can flow under its own weight to completely fill the form work and self-consolidates without any mechanical vibration. Such concretes are an accelerate for the placement, to reduce the labour requirements needed for consolidation, finishing and eliminate environmental pollution. This will ensure that the concrete obtained has good flowability, self-compacting ability and other desired SCC properties. The European Federation of Producers and Applicators of Specialist Products for Structures (EFNARC) [2005] have also laid down certain guidelines for fresh properties of SCC.

Which can placed and compacted in to every corner of a formwork; purely means of its self-weight by eliminating the need of either external energy input from vibrators or any type of compacting effort. There is a current trend in all over the world to utilize the treated and untreated industrial by- products, domestic wastes etc., as raw materials in concrete. These not only help in reduce of the waste materials but also create a cleaner and greener environment.

In this study the main aim is to focus on the possibility of using industrial by product as a waste material in a preparation of innovative concrete. One kind of waste was identified as Glass Powder (GP) and another one is fly ash. The use of this Glass Powder and fly ash are the partial replacement of fine aggregate and cement was proposed in different percentage for production of self-compacting concrete. The experimental work deals with the ingredient of these mixtures (Glass powder, fly ash, super plasticizer, and cement) to improve the strength by examining their specific role in self-compacting concrete.

Keywords– Glass Powder (GP), Self-Compacting Concrete (SCC), Self-Compatibility, Compressive strength, Flexural strength.

1. INTRODUCTION

Concrete is a widely used construction material around the world, and its properties have been undergoing changes through technological advancement. Numerous types of concrete have been developed to enhance the different properties of concrete. So far, this development can be divided into four stages. The earliest is the traditional normal strength concrete which is composed of only four constituent materials, which are cement, water, fine and coarse aggregates. With a fast population growth and a higher demand for housing and infrastructure, accompanied by recent developments in Civil Engineering, such as high-rise buildings and long-span bridges, HIGH COMPRESSIVE strength concrete was needed.

The development of SELF-COMPACTING Concrete can be assumed to be the most important one into the building material's domain. This is due to the benefits that this concrete offers:

- The technology of producing self-compacting Concrete can be considered as an energy conservation process, since the electricity consumption for vibration it is eliminated; use of Self-Compacting Concretes increase the lifetime of the construction moulds, reduces the necessity of skilled workers.
- SCC can be used for all types of structures due to the fact that it can be pumped at long distances without any of its segregation.
- From the contractor's point of view, costly labour operations are avoided improving the efficiency of the building site.
- The concrete workers avoid poker vibration which is a huge benefit for their working environment.
- When vibration is omitted from casting operations the workers experience a less vigorous work with significant less noise and vibration exposure.
- Very good finishing surfaces of the elements made with Self-Compacting Concrete, which is a cut in remedial costs.
- SCC is believed to increase the durability relatively to vibrated concrete (this is due to the lack of damage to the internal structure, which is normally associated with vibration).Construction practice and performance, combined with the health and safety benefits, make SCC a very attractive solution for both precast concrete and civil engineering construction.

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Novel Insights Into Cryptovirology : A Comprehensive Study

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Abstract—Cryptography is presently used for defensive purposes. Ciphers are used against passive attackers. Public key algorithms are used against an active attacker in man-in-the-middle attack. Digital signature is used for defending against a forger. E-cash systems are used against a counterfeiter and a double-spender. Pseudorandom bit generators are used against a next-bit predictor. Crypto virology is used for locating failures of protocols and vulnerabilities in design. For defending purpose Forward engineering is used.

Keywords— Cryptography, Cryptovirology, Public Key, Security, Cryptovirus, FIPS, PKCS

I. INTRODUCTION

Cryptovirology is the study of the applications of cryptography to malicious software. It is an inspection on working of modern cryptographic structures that can be used to strengthen, improve, and develop new dangerous malware attacks. The attack of Crypto virology are used for assurance of advancement in privacy and more strong against reverse-engineering, gives the attacker an enhanced anonymity when Communicating with located malware (e.g., over public bulletin boards and Usenet Newsgroups), improve the ability to steal data, improve the ability to carry out extortion, Enable new types of denial-of-service; enable fault-tolerance in distributed crypto viral attacks, and so on. Also, recent work shows how a worm can install a back door on each infected system that opens only when the worm is presented with a system-specific ticket that is generated by the worm's author. This is called an access-for-sale worm [1].

1.1 Cryptovirus

In security of a computer, a virus is defined as a computer virus that contains and uses a public key. Usually the public key belongs to the author of the virus, though there are other possibilities as well. For instance, a virus or worm may generate and use its own Key pair at run-time. Crypto viruses use secret sharing to hide information and communicate by reading posts from public bulletin boards. Cryptotrojans and crypto worms are the same as crypto viruses, but they are Trojan horses and worms. A virus that uses a symmetric key and not a public key is not a Crypto virus (this is particularly relevant in the case of polymorphic viruses).

There are several rules that all viruses seem to obey.

- By virtue of being programs they all consume CPU time and occupy space.
- Since viruses need to gain control of the program counter in order to execute, they must (directly or indirectly) modify code in the host system in order to do so.
- Their inherent vulnerability to user scrutiny is the last and perhaps most interesting rule of viruses

Viruses can always be frozen and analyzed by the user. They can be backed up (or a backed up copy can be found) and later scrutinized in detail using a low level debugger. In what follows we show that this vulnerability can be effectively bypassed if strong cryptographic techniques are employed and if the virus acts fast enough, i.e. before detection. We also suggest countermeasures and mechanisms to cope with and prevent such attacks[2]. These attacks have implications on how the use of cryptographic tools should be managed and audited in general purpose computing environments, and imply that access to cryptographic tools should be well controlled. The experimental virus demonstrates how cryptographic packages can be condensed into a small space, which may have independent applications (e.g., cryptographic module design in small mobile devices). Hackers have uncovered the dark side of cryptography—that device developed to defeat Trojan horses, viruses, password theft, and other cyber-crime. It's called crypto virology, the art of turning the very methods designed to protect your data into a means of subverting it. In this fascinating,

Title

The Vulnerabilities of Rogue Algorithms: Novel Perspectives

Authors

Manas Kumar Yogi

Devi kakarla

Abstract

Given the majority of this current, it's hard to conceptualize oversight for algorithms, notwithstanding when they've turned out badly and are currently damaging individuals. So far as that is concerned, not a wide range of damage is unmistakably quantifiable in any case. One can make the contention that, what with all the spurious news gliding around, our popular government has been damaged. In any case, how would you quantify democracy? This shouldn't imply that there is no expectation. All things considered, by definition, an unlawful algorithms is collapsing upon a real law that we can point to. There is, at last, somebody that ought to be considered responsible for this. The issue still remains; in what capacity such laws will be implemented.

Key Words

Rogue, AI, Bias, Deep Learning

A Propulsive Roadmap for IoT Beyond 2025

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--ABSTRACT--
IoT is a worldwide-recognized trend that is gaining popularity incredibly fast. The baseline lies in the fact that
IoT has already transformed a number of industries and took them to the new level, and these industries include
healthcare, finances and much more. No wonder there is such a hype about it .There are tremendous new
opportunities with IoT flowing out every couple of months so we highly recommend all to keep an eye on this
technology. In this paper will have shed light on the inherent concepts which will affect the working of IoT beyond
2025.We have discussed key points in this paper regarding the operational components of an IoT System where
improvements can be done by researchers so as to leverage the usage of IoT environment.
Keywords - IoT, Nano, Sensors, Cognitive, network, RFID.

I. INTRODUCTION

The Internet of Things may be a captivating issue in the business anyway it is definitely not another thought. In the mid 2000's, Kevin Ashton was laying the arrangement for what may transform into the Internet of Things (IoT) at MIT's AutoID lab. Ashton was one of the pioneers who envisioned this idea as he examined for ways that Delegate and Gamble could improve its business by interfacing RFID information to the Internet. The thought was essential yet competent. If all things in step by step life were furnished with identifiers and remote accessibility, these things could be talk with each other and be regulated by PCs.

The term Internet of Things (IOT) has been around for a long time. In this circumstance, it is gaining ground with the improvement of front line remote development. The principal thought of this thought is the closeness of an arrangement of articles –, for instance, RFID, NFC, sensors, actuators, mobile phones. In this IOT development the RFID is the most basic thought and it is essential for web of things. Unmistakable developments in publicize like RFID, machine to machine correspondence, vehicle to vehicle correspondence molecule etc. are actualized using IOT[8]. The basic issue of IOT is going up against circumstance of security the potential Hackers who always on edge to strike. The ability to code and track objects has empowered associations to end up more powerful, quicken shapes, lessen bumble, keep away from robbery, and join mind boggling and adaptable legitimate systems through IOT.

The "Internet of Things" alludes to the coding and systems administration of ordinary items and things to render them independently machine - clear and traceable on the Internet Much existing substance in the Internet of Things has been made through coded RFID labels.

Identification technology-thing DNA identifier

Over the significant lot, the Internet of Things might be viable in case we make sense of how to relate all the different devices in an especially uncomplicated way. At the present time, the nonappearance of interoperability is baffling expansive utilize. An average tongue could be an answer and the contraptions itself need to wind up more watchful. A characteristic living being passes on in each cell the aggregate genotype with solitary "working rules". This could be a perspective for the Internet of Things.

Today, all the different devices with their individual limits inside the Internet of Things give by methods for their own, prohibitive procedures. Honestly, there are presently an extensive variety of genuine standards, it's essentially that these restrictive occur inside each individual industry. If you have to relate the particular regions and devices with each other, a foundation quickly ends up being astoundingly awesome.

A focal control unit makes IoT environments susceptible: The normal "connector" to date is by methods for a principle issue. Sensors assemble data and send these to a gateway or cloud server. Starting there the data is deciphered and actuators controlled suitably. In the field of building robotization, this can frequently be things like warming controls, light switches, modernized entryway or shade controls[9]. In solitude nevertheless, without the central section or cloud game plan, most of the sensors and actuators are all around defenseless. Just by virtue of learning inside that central control unit they can fulfill their work and team up with each other.

II. INTERNET OF THINGS ARCHITECTURE AND TECHNOLOGY

A. Cognitive Architectures:

Cognitive computing

Cognitive computing mimics human senses. One connection between big data analysis and cognitive computing is human's big data thinking. The experience constantly accumulates during the life of human being. The second level is pursuing spiritual culture and the third level is concerned with the meaning of life. The amount of people in top level is the least. Currently, the thinking that is simulated by machine intelligence mainly focuses on

Green IOT: Principles, Current Trends, Future Directions

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Abstract

The two trending and popular technologies are Cloud Computing (CC) and the Internet of Things (IoT) are current hot discussions in the field of agriculture and healthcare applications. Motivated by achieving a sustainable world, this paper discusses various technologies and issues regarding green cloud computing and green Internet of Things, further improves the discussion with the reduction in energy consumption of the two techniques (CC and IoT) combination in agriculture and healthcare systems. The history and concept of the hot green information and communications technologies (ICT's) which are enabling green IoT will be discussed. Green computing introduction first and later focuses on the recent works done regarding the emerging technologies. Finally, lists out the advantages, challenges, and future research directions related to green application design. Our research aims to make green area broad and contribution to sustainable application world.

1. Introduction to Green IoT

Security in IoT is a nightmare in spite of its good use on a large-scale. Generally, IoT is a combination of three main technologies.

- Information Technology
- Operations Technology
- Consumer Technology

Internet of Things is a network of electronics, home appliances, vehicles, entrenched with electronics, software, sensors, actuators and network connectivity, which enables these objects to connect and exchange data. Each thing is uniquely identified using its built-in address, and is able to inter-operate within the exiting internet infrastructure.

Smart world is beholding as an era in which objects can automatically and intelligently serve people in a collectible manner. Internet of Things (IoT) connectseverything in the smart world. Particularly, an overview regarding IoT and green IoT is performed first. Then, the hot green information and communications technologies (ICTs) enabling green IoTare studied, and general green ICT principles are epitomized. Furthermore, the latest developments and future vision about sensor cloud, which is a novel paradigm in green IoT, are reviewed and introduced, respectively. Our work targets to be an enlightening and latest guidance for research with respect to green IoT and smart world.

IoT ELEMENTS In this section we have listed and discussed on some key elements for IoT and IoT based applications. If we classify IoT elements/components into few basic categories that aids seamless connectivity then it can be as followed: (i) Hardware (ii) Middleware (iii) User End Visualization actuators, embedded devices and other communication

Hardware constitutes of various sensors, actuators, embedded devices and other communication devices. Middleware constitutes of various tools used for on demand storage of data collected by sensor devices and processed by embedded devices and various computing tools used for data analytics.User End Visualization consists of various data visualization and interpretation tools which can be accessed on various diverse platforms which aids the enduser to keep a track of various events driven by those data collected by various sensory hardware. We have highlighted few breakthrough and enabling technologies in the above mentioned categories which will provide a clear conscience for the three components listed in figure 1.

2. Applications of Green IoT

The Green IoT which makes the smart devices to communicate with real world and which focuses on saving of energy and pollution.

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Fig.1: Overview of Green IoT

The numerous applications of Green IoT are as follows:

A. Smart Home: A G-IoT enables home equipped withlighting, heating, and electronic devices that can be controlled remotely by using smartphone or computer. It can be equipped with Waste removal, Ultrasonic showers, Beds that make/change sheets themselves, Lighting creates artificial sunrise, Computer suggests clothing based on your taste, weather, Windows and walls will allow adjustable amounts of sunlight, warmth or cold in, Electronic soundproof rooms and windows. Soundproof energy fields that you can walk through, Hidden computers, sensors, microphones and electronics throughout the house. Central computer accepts voice commands, distinguishes between occupants for personalized responses and actions, Television, computer and phone merge into one device etc.

B. Industrial Automation: Industries have beenautomated with machines that allow for fully automated tasks without or with little manual intervention. An internet based industry automation system that allows a single industry operator to control industry appliances.

C. Smart Healthcare:IoT is to refashion Healthcareindustry by bringing up new and advanced sensors which are connected with Internet producing essential data on real-time. It helps in achieving three key, outcomes of any efficient health care services-improved access to care, increased care quality, reduced care costs.

D. Smart Grid: Much like the Internet of Things, asmart grid is about balance. It is about efficiency. It is about dynamically adjusting and re-adjusting to optimally deliver energy at the

Enhancing ability of user personalization by application of rough fuzzy grouping mechanism for improved web intelligence

January 2019

Authors:

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Abstract

In contemporary world, Web personalization tenders accurate means for the evolution of operations that have the enticing feature to satisfy compelling obligation of their end user. To perform that, developers of web need to face an decisive trial regarding the disclosure of information of concern which the end users show while they reach out to various sites. Web Usage Mining is a functioning exploration region which regards the disclosure of helpful examples of run of the mill client practices by using utilization information. Grouping has been hugely applied for sake of classifying users having identical concerns. Rough fuzzy grouping proves to be an mechanism handy to deduce user sections from web use information accessible via server history files. It is well known that fuzzy grouping works on mechanism of distance-based metrics to judge the similarity among user choices. But the application of such techniques may propel to feeble outcomes by classifying user groups that do not include the meaningful knowledge assimilated. In this paper, we advocate an technique based on a rough fuzzy grouping algorithm armed with a rough fuzzy similarity metric to deduce user groups. For pertinence, we deploy the presented technique on users data extricated from server history files of a popular web site.

Application of Modified Memetic Algorithm to Uncover Authorship Styles in Software Forensics

Y. Manas Kumar, L. Yamuna, S.R.Y .Himatej

Abstract: *Our paper sincerely advocates a memetic algorithm to uncover authorship styles. For software forensics experts our proposed mechanism will greatly reduce the time, effort whenever a malicious job is done to break into a software system. We have considered three factors, namely the variable naming convention, usage of comment styles. We have considered three factors, namely the variable naming convention, usage of comment styles, usage of data structures. We observe that these 3 factors can greatly help to uncover authorship style of a pro-grammer thus saving us from further damage in this technologically dependant society.*

Keywords: *Software forensics, Memetic, Authorship, nearness value, genetic.*

I. INTRODUCTION

Adversaries in software industry exists in forms which are quite difficult to analyses software forensics is counted up as one of them .the most popular software threats are viruses, logic bombs, Trojans worms which leave the functionality of a software as a regret after their attack is completed damage detection happens only after the adversaries finish their task intrusion detection engineers face this uphill challenge of reporting the damage done to the software researchers have found that 70% of adversaries who crack the software leave behind some code in software forensics field this leftover traces of code are analyzed to get an insight of the nature of the programmer. Multiple factors effect a person's programming style, so to establish an authorship style is not easy as said. In this paper we will look into the factors through which we can obtain styles of coders. The main issue is lack of robust formal methods (or) tools to meet this challenge ,no method of discouraging anonymity in software system is full proof given contexts which change with respect time .Talking of remnants of an attack viruses generally deposit their code in source files, object code executable code .In software forensics domain, this code acts as evidence which is used to verify source of the attack .this corresponds to how legal officials work with handwriting analysis to identify suspects who may be involved in such crimes.

in programming languages few languages heavily use Data types control structures in innovative way which gives scope for authors to develop their unique styles while developing software. While development reuse debugging of code usage of certain stylistic elements help a lot. Also, the gravity of this challenge increases when two (or) more authors collaborate to develop a single module of a software. In such cases the authorship styles are mixed and tracing individual authorship is impossible. to start the process of identification samples of

code are kept for observation if samples of code amount significantly then statistical methods can be easily applied to find authorship of the code but our immediate issue is that code after compilation (or) optimization may not look exactly same as the original source code .so, reverse engineering such codes may induce considerable amount of ambiguity which effects analysis at further stages. Other feature which has to be seriously looked into is choice of data structures and algorithm. beginners would not prefer advanced data structure with which they are comfortable .in same sense choice of algorithms also rests with authors based on their competence level complex algorithm, even if they are time saving is not picked up by large number of coders for obvious reasons, the next feature in contention for authorship analysis is usage of error handling methods. it has been found by practitioners that seldom such codes occur in case they occur, it is due to developmental policies enforced by team managers which is part of routine error checking individual authors mostly neglect exception handling routines in their code. The next feature is choice of system calls while providing support to code .this scenario mostly occurs in UNIX like environment. For instance index, strchr methods are part of two different versions of UNIX each author gets habituated only to usage of the same method while coding the last feature but definitely the most importance one we consider in this paper is nature of errors made by authors. some authors make same kind of errors consistently for example off by one error in loops for arrays or while referencing dereferencing pointers after proper comparison of such error this can be used as a metric in uncovering authorship style. Memetic algorithms have derived strength from computational intelligence.

Repressing Superfluity in Wireless Sensor Network Traffic by Application of Kalman Filtering Technique

Manas Kumar Yogi, L. Yamuna, K. Chandrasekhar

Abstract: Repetition concealment is a system traffic pressure method that, by reserving repeating transmission substance at accepting hubs, maintains a strategic distance from more than once sending copy information. Existing executions require bounteous memory both to investigate ongoing traffic for superfluity and to keep up the reserve. Remote sensor hubs in the meantime can't give such assets because of equipment imperatives. The decent variety of conventions and routing designs in wireless sensor networks organizes besides builds the density of signal propagation and extents of excess in traffic capricious. The regular routine with regards to narrowing down pursuit parameters in view of qualities of delegate parcel follows while analyzing information for repetition along these lines winds up unseemly. These inherent challenges influenced to construct a different convention that leads a probabilistic influx examination to recognize and store just the batch of repetitive exchanges that results most density of traffic reserve funds. We observed this way to deal with an answer based on thorough examination and without limits reservations to be practicable.

Index Terms: fingerprint, Superfluity, rehashing, cut points

I. . INTRODUCTION

Superfluous information exchanges squander arrange assets and have for some time been liable to thinks about on the best way to stay away from them. Normally utilized arrangements incorporate storing the responses to visit information demands [1], or applying mass pressure to reduced information before sending [2]. Superfluity Repressing is one specific technique that averts rehashed exchanges of indistinguishable information over system joins. The fundamental thought is to keep certain approaching information in memory at the getting hub. In the event that another trans-mission of similar information wound up essential from that point, it tends to be reproduced locally from the recently stored information as opposed to having it sent once more. This thought was first acknowledged by Santos et al. [3] in an exceptionally straightforward structure. Their answer tracked late friendly parcels at the sending hub by figuring a solitary hash incentive over every bundle's payload substance and checking rehashed hash events. Over a specific tally limit, it supplanted the payload of the active bundle with its a lot littler hash esteem.

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The hub on the less than desirable end similarly followed repeating payloads and put away in a reserve table the approaching information surpassing the edge. It would then have the capacity to supplant along these lines accessing by their comparing information from neighborhood memory. This precedent delineates the key plan parts of a Superfluity Repressing convention. In the first place, traffic should be logged for examination with the goal that excess parts can be identified. Besides, the sending and accepting hubs both need to concede to an arrangement which excess information to store and how the reference to such duplicate information is conveyed. Ongoing distributions [4,5,6,7,8] have concentrated on the issue of how to recognize indistinguishable information sub substance between subjective information sets– rather than simply coordinating total bundle payloads – utilizing different finger printing [9] and piecing [6] strategies. The corresponding work – talked about more completely in Sect. 4 – is anyway gone for improving convention execution for rapid systems and does not fit the necessities of remote sensor systems. The utilization of Superfluity repressing in remote sensor systems has not yet been researched as of right now. It is effectively persuaded as lessening the measure of information exchanges over the system spares transmission vitality, a fundamental asset of battery driven sensor hubs. Moreover, Superfluity repressing is generally integral to existing traffic sparing strategies and accomplishes traffic decrease autonomously of the numerous sensor arrange conventions as of now being used. our paper represents observational models for the above focuses in Sect. 2.In this paper we present a Superfluity repressing convention that we conceived with the points of interest of remote sensor arranges as a main priority. Our paper develops mechanisms which investigates traffic without assumptions on the highlights of superfluity like its recurrence or granularity of event. It doesn't restrain the pursuit space of the information investigation like existing arrangements do, making it relevant for erratic and subjective traffic substance. In the meantime, our convention is equipped towards finding just those covers in information that yields most investment funds when stifled. It reserves the best end portion of such redundancies as restricted by memory requirements of the hubs. On a specialized dimension, our commitment lies in a novel use of lumping for superfluity investigation and its blend with a possibilities of recurrence checking information structure to keep up superfluity information sufficiently precise to put

Application of Kraft–McMillan Inequality for Software Test Case Prioritization

Manas Kumar Yogi, Karri Vijaya Lakshmi, Koondrapu Koushik Sri Sai

Abstract: The motivation behind this prioritization is to improve the probability that if the experiments are utilized for relapse testing in the given request, they will more firmly meet some goal than they would on the off chance that they were executed in some unique request. A few associations want to run "Smoke" or "Sanity" test each time they get another form or form of the creating software. For this situation, experiments will be organize dependent on all the real modules of the software and sanity will be kept running on them to check the fundamental usefulness for instance, in a mobile testing, sanity test suite will have experiments like "restarting the gadget", "killing", "marking in", "refreshing software" etc. Whether the company runs relapse or sanity or both, Test Case Prioritization procedures are pertinent for every one of the cases. Organizing experiments should be possible based on necessities, expenses of bug fixing, history of the parent gadget and so forth. In this paper we apply a novel approach of data structures to develop a friendship relation between similar test cases so as to not spend time on testing similar functional test cases. At the end of the paper we find appreciable experimental results which outweigh the current techniques used in software testing area.

Index Terms: Test case ,Prioritization, Kraft, McMillan, Friendship.

I. INTRODUCTION

Testing is a crucial phase of software Development Life Cycle. Software testers prioritize the test cases which are more important, by some measure, are run earlier in the regression testing process. Regression testing is an costly testing procedure used to validate modified software. If we have thousands of test cases in regression suite and do not have sufficient time to execute all test cases, then we execute the test cases based on prioritization. Whatever the tests may be whether they are smoke, sanity or regression , Test case prioritization techniques are applicable for all the cases and used to schedule test cases. This is useful in order to minimize time, cost and effort during software testing phase. Testers can easily execute test cases, which have high priority and provide earlier defect faults. Some prioritization test cases may have similar test cases. Executing all the testcases results in waste of time. To eliminate similar test cases we establish a friendship relation between the trees constructed with test cases.

II. PROPOSED MECHANISM

Our paper proposes a property of Kraft–McMillan inequality to arrange the test cases according to a specific priority order . Kraft's inequality constraints the execution of test cases in a test suite: if we consider an complex and lengthy test suite of , that is, it must have total measure less than or equal to a healthy friendship value. Kraft's inequality can help in identifying test cases which may be redundant or similar and does not affect the quality of the testing process. We have defined a friendship value between 2 trees. Each of these binary trees store test case number which is related to a particular functionality. For each binary tree we apply the Kraft–McMillan inequality to obtain the value of

We Consider a set $Ts = \{T1,T2,T3\ldots\ldots\ldots T100\}$ with 100 test cases and it is equally partitioned into two equal sets $Ts1 = \{T1,T2,T3,\ldots\ldots\ldots T50\}$ and $Ts2 = \{T51,T52,T53,\ldots\ldots T100\}$ with 50 testcases in each set. Each set is partitioned into seven binary trees with equal number of testcases because the trees with different number of test cases may not have friendship. Test cases are arranged in a tree based on their prioritization and no testcase should be repeated. $Ts11(7)$, $Ts12(7)$, $Ts13(7)$, $Ts14(7)$, $Ts15(7)$, $Ts16(7)$, $Ts17(8)$ are the trees obtained by dividing Ts1 Set. $Ts21(7)$, $Ts22(7)$, $T23(7)$, $Ts24(7)$, $Ts25(7)$, $Ts26(7)$, $Ts27(8)$ are the trees obtained by dividing Ts2 set. we will calculate Kraft–McMillan inequality for each tree. Now, we will find the Kraft-McMillan difference between each tree in set1 to remaining trees in set2 to calculate the friendship between the trees. The difference is calculated as $Kraft(Ts11) - Kraft(Ts21)$.similarly it is calculated for other trees. The Kraft–McMillan inequality difference is inversely proportional to friendship. If the friendship is between the range 0-0.05 then the two trees are said to have high friendship. .If the friendship is equal to 0.05 then the two trees are said to have medium friendship. .If the friendship is between the range 0.05-1.00 then the two trees are said to have low friendship. The trees with high friendship have similar test cases The total test cases in the two trees which have high friendship need not to be executed. The test cases either in tree1 or tree2 can be executed.

III. TYPES OF TEST CASES

A. Blockers

These are the test cases that test the life line of a software. The software can be useless if those are not performed.

Title

Brain to Brain Communication: A Study on Future Technology

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Ch Venkata Ramana

D Sirisha

P S Prabhakara Rao

K Sunil Kumar

Abstract

This is the very newest technology where machine can understand the feelings of human being and act according to that. If you are unable to see, talk, listen and till do you want to communicate? no problem, HIBA will be there with you. This paper is about the new technology , which will be implemented in the future. Hybrid Intelligence Biometric Avatar(HIBA) can understand the feelings of any person and even become the part of their fabric. We can say that 'speech' communication will be replaced by 'thought' communication in future.

Key Words

Cite This Article

ISSN

Translation and Transliteration of words

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Abstract— Translation is one of the oldest large-scale applications of computer science. Machine Translation is the application of computers to the translation of texts from one natural language into another natural language. Machine language is included in the wide domain of Natural Language Processing(NLP), the field of learning concerning with the study and development of computer systems for processing natural (human) languages. The need for MT continues to increase in today's networked world, the need for systems to help humans read documents written in a variety of languages is constantly growing. The ideal aim of machine translation systems is to produce the best possible translation without human assistance. Basically every machine translation system requires programs for translation and automated dictionaries and grammars to support translation.

Keywords— NLP,Translation,Dictionaries,Transliteration,Unicode

I. INTRODUCTION

Machine Translation is the application of computers to the translation of texts from one natural language into another natural language. Machine Translation is one of the important applications of Natural Language Processing. Machine translation helps people from different places to understand an unknown language without the aid of human Translator. The language to be translated is source language(SL). The language to which source language translated is Target Language(TL). India has linguistically rich area – it has 18 constitutional languages which are written in 10 different scripts. India is a Hindi speaking country. About 60%-70% population of India knows and understands Hindi. It is only about 3%-5% population who knows & understands English. Hindi is a relatively free word-order language. Hence an English to Hindi Translation systems will be of great use. **Our project is English-Hindi Machine Translation system** which is used to translate English words to Hindi. English is the source language and Hindi is the target language in our project.

Transliteration is one of the phases of Machine Translation. Transliteration is defined as the task of transcribing a word or text from one writing system into the another writing system. Cognates (the words derived from another language) and Named Entities (NE) such as the person names, names of places, organizations are the types of words that need transcribing into the another writing system. Transliteration is one module of our project.

The main objective of Machine Translation (MT) is to break the language barrier in a multilingual nation like India. Majority of the Indian population is not familiar with English while most of the information available on web or electronic information is in English. Hence a novel Machine Translation System for English to Hindi translation and transliteration is developed.

II. LITERATURE SURVEY

As India is a large multilingual country, different states have different regional languages; hence for proper communication there is a need of machine translation. Machine translation helps people from different places to understand an unknown language without the aid of human Translator. The language to be translated is source language(SL). The language to which source language translated is Target Language(TL). The major machine translation techniques are Rule-Based translation

A SELF-REGULATING STREET LIGHTNING TECHNIQUE USING IOT

[1]Y Srilatha, [2]N V S Sowjanya, [3]B Preethi Devi, [4]A Rasi Deepika

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Abstract: The main consideration in the present field technologies are Automation, Power consumption and cost effectiveness. Automation is intended to reduce man power with the help of intelligent systems. Power saving is the main consideration forever as the source of the power (Thermal, Hydro etc.) are getting diminished due to various reasons. As we all know that energy consumption has increased a lot and sources of energy are limited so in order to meet the increasing demand of energy use of renewable sources of energy is a must. This paper aims to describe a method for modifying street light illumination by using sensors at minimum electrical energy consumption. When presence is detected, all surrounding street lights glow at their brightest mode, else they stay in the dim mode. LED bulbs are used as they are better than conventional incandescent bulbs in every way. This will reduce heat emissions, power consumption, maintenance and replacement costs and carbon dioxide emissions. Coupled with SSSLS (Solar Smart Street Light System), massive energy-savings are envisioned. Also, a demonstration with a real-time proto type model involving costs and implementation procedure has been developed using internet of things (IoT) to visualize the real time updates of street processing and notifying the changes occur.

Keywords: LED, Arduino, IoT, IR Sensor

1. INTRODUCTION

Nowadays, human has become too busy, and is unable to find time to switch the lights wherever not necessary. The present system is like the lights will be switched on in the evening before the sun sets and they are switched off the next day morning after there is enough light on the outside. With this, the power will be wasted up to some extent. But the actual timing for these lights to be switched on are when there is absolute darkness.

This paper gives the best solution for electrical power wastage. Also, the manual operation of the lighting system is eliminated. The energy consumption in entire world is increasing at the fastest rates due to population growth and economic development and the availability of energy sources remains woefully constrained. Resource augmentation and growth in energy supply has not kept pace with increasing demand and, therefore, continues to face serious energy shortages.

Streetlights are an integral part of any developing locality. They are present on all major road- ways and in the suburbs too. Every day, streetlights are powered from sunset to sunrise at full strength, even when there is no one around. On a global scale, millions of dollars are spent each day on these street lights to provide the required electrical energy. The maintenance and replacement costs of conventional incandescent bulbs are immense. They consume a lot of electric power to function and their heat emissions are also quite high. All of this contributes to greater demand of electricity production and consequently, more carbon dioxide emissions from powerhouses.

This paper aims at harvesting the energy from renewable energy sources like sun and to effectively use the harvested energy for the benefit of mainly the remote villages (villagers) facing the serious power problems. The main aim of this paper is to provide a IoT based Automatic Street Lightning System powered with solar energy during night time. We use the word smart because the system not only provide power to the street lights but also helps in detecting the direction of movement of the pedestrian and helps him by means of illuminating the path of movement till the near next street light. By integrating the entire street lights with Smart street light system it is possible to systematically help the pedestrian to reach the destination in the remote rural areas which are facing serious electric power supply problem. The same system can also be used in metropolitan cities as well. A simple and effective solution to this would be dimming the lights during off peak hours. Whenever presence is detected, the lights around it will glow at the normal (bright) mode. This would save a lot of energy and reduce cost of operation of the streetlights. We can check the status of street light on internet using IOT (Internet of things) from anywhere in real time and solve the issues if happen during the processing.

2. RESEARCH METHODOLOGY

2.1. Functional Description:

The present system employs power delivery via a single-phase line to the streetlight. The proposed system involves five more components to regulate the power delivery. An Infra-Red Proximity Sensor at the base of the street light detects presence in

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This is the very newest technology where machine can understand the feelings of human being and act according to that. If you are unable to see, talk, listen and till do you want to communicate? no problem, HIBA will be there with you. This paper is about the new technology , which will be implemented in the future. Hybrid Intelligence Biometric Avatar(HIBA) can understand the feelings of any person and even become the part of their fabric. We can say that 'speech' communication will be replaced by 'thought' communication in future.

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MATERIAL

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Abstract— The objective of the present study is to analyze the effect of Equal Channel Angular Pressing (ECAP) on the mechanical properties of Al4032–SiO_2 composite. These composites have been prepared by stir casting route in which the weight % SiO_2 nano particles are 0.25, 0.5, 0.75 and 1wt%.The ECAP process is done at a room temperature using a die with channel angle of 105° and corner angle 30^0. The influence of ECAP on mechanical properties of Al4032 –SiO_2 composite is evaluated. In general in any composite the distribution of reinforcement particles can be observed with the micro-structural examination, but the effect of ECAP will be there on the mechanical properties of composite, so that here we have taken the evolution of Al4032-SiO_2 mechanical properties before and after ECAP process. As the agenda of ECAP is to improve the mechanical properties we have observed the great improvement in the mechanical properties.

Keywords— AL 4032, SiO2, Composite Material, Stir-Casting, ECAP, & Mechanical Properties.

I. INTRODUCTION

From the past few years, many of the researchers are focused on finding the light weight and better performance materials to replace the existing heavy weight materials [14,15]. The aluminium alloys (Al4032) are widely used for manufacturing the internal combustion pistons in place of cast iron and other heavy weight materials [1,3], because of their lesser weight[14,15]. Some of the researchers prepared the Al base metal matrix composites reinforced with SiO_2 to enhance the mechanical properties [2,14,15]. To prepare the composite material people choose a best and easy process called stir casting process [4,5]. This process is widely used to prepare the composite materials.

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Experimental Study on Mechanical Properties of Polymer Based Hybrid Composite

H.B. Vinay [a] ⊠, H.K. Govindaraju [b], Prashanth Banakar [c]

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Abstract

The current investigational study observes the mechanical characterization of polymer based hybrid fiber composites. Specimens are kevlar/carbon fibre with vinyl ester resin & glass/carbon fibre with vinyl ester resin hybrids were prepared by hand layup technique, the weight fraction of fibre and matrix was maintained at 60% & 40%. The laminated samples are cut to the ASTM standards. The samples are subjected to elongation & bending loads causing tensile & flexural stress in the constructions. The purpose of this work is to experimentally analyse the progressive failure process of hybrid laminated composites subjected to tensile &flexural loads, and perform the hardness of hybrid composites.

FLOW BEHAVIOUR ON ELBOW WITH VARIOUS GEOMETRIES OF NOZZLE

June 2019

Authors:

Satish Geeri
Pragati Engineering College

Figures (2)

Abstract and Figures

Elbow is one of the most common components in the pipe line system, where pressure difference occurs as a fluid flow. o Due to the pressure difference, centrifugal force is developed. For this reason, the behaviour of the fluid flow in a 90 elbow for different geometries of nozzle have been studied using the FLUENT software. Ten different models were investigated based on the K-ε model of the energy equation. The analysis was simulated in terms of the velocity and pressure contours and comparison is done. The analysis has been done for 10 different models with changing the angle of convergence from to and found that the velocity gradients are increasing and pressure gradients are decreasing in an ascending order of the angles of convergence for nozzle geometry. The software values are compared to the regression values and found to yield good agreement with the simulated values.
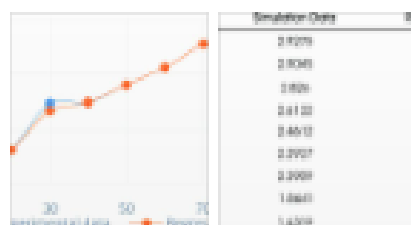
& 6. In the model   Contour Values of
M2 & M4, there i...Static Pressure...

EXPERIMENTAL STUDIES ON MECHANICAL PROPERTIES OF POLYMER BASED COMPOSITES

Authors:

Satish Geeri
Pragati Engineering College

PRASAD S. SAMBHU

V. V. S. PRASAD

Shake Table Experiment on Reactor Vessel

D.J.Johnson[1], G.Lavanya Lakshmi[2], B.AnushaSrikanta[3], S.Srikanth[4]

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Keywords: *Nuclear accident, structures, natural Hazard, main vessel, shake table*

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Shake table tests are by far the best suited for studying the response of buildings, structures, structural components, equipment and machinery under simulated base excitation. Uni-axial, bi-axial and tri-axial tables are common. In a tri-axial shake table all six degrees of freedom can be reproduced. The shake table consistent with the performance requirements is actuated by multiple servo-controlled electro hydraulic actuators. A rigid mass to anchor the actuators and to support the shake table, a sophisticated electronic control system, and a foundation scheme with or without dampers complete the test facility. Compared to many other test facilities shake tables require a large dedicated building. Unlike many other equipment which can be directly installed once they are bought, shake table systems are custom built. The integration of the various components is to be done at site and large scale checking is necessary before eventual commissioning of shake table system. Even though the test runs for short duration, huge hydraulic power supply is usually required even for moderate size shake tables with reasonable performance criteria. Most civil engineering structures tested on the shake table are modelled to the scale ratios 1:2 to 1:100. Appropriate similitude analysis is used to scale the parameters. Smaller shake tables which are driven by electro dynamic shakers have high acceleration requirements and can support only limited mass. Typically shake tables used for R&D purposes have a payload capacity varying between 10 to 100 t. the acceleration levels are in the range of 0.8 to 2.0 g, velocity in the range of 0.8 to 2.0 m/sec, and displacement in the range of 50 to 200 mm. The performance of the shake table is governed by the performance envelope of the actuator.

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Two types of foundations are common, namely the fixed type and the floating type. The floating type is nearly two to three times as costly as fixed type. The natural frequency of the foundation-soil system lies normally in the range of 20 to 40 Hz. The fixed foundation requires larger mass than floating foundation. Transmission of vibration in to the environment is extremely low in case of floating foundation. Floating foundations have problems at low frequencies, and hence may pose problems for large size models.

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A methodology for topology optimization to the design of compliant cellular mechanisms with and without internal contact is presented. A two-step procedure is pursued. First, a baseline noncontact mechanism is developed and optimized via an inverse homogenization method using the "solid isotropic material with penalization" approach. This compliant mechanism is optimized to yield specified elasticity coefficients, with the capability to sustain large effective strains by minimizing local linear elastic strain. In the second step, a system of internal contacts is designed. The initial continuum model of a noncontact mechanism is converted into a frame model, and possible contact links are defined. A computationally efficient algorithm is employed to eliminate those mechanisms having overlapping contact links. The remaining nonoverlapping designs are exhaustively investigated for stress relief. A differential evolution optimizer is used to maximize the stress relief. The results generated for a range of specified elasticity coefficients include a honeycomb-like cell, an auxetic cell, and a diamond-shaped cell. These various cell topologies have different effective properties corresponding to different structural requirements. For each such topology, a contact mechanism is devised that demonstrates stress relief. In one such case, the contact mechanism increases the strain magnification ratio by about 30%.

EFFECT OF EQUAL CHANNEL ANGULAR PRESSING ON THE MECHANICAL PROPERTIES OF AL 4032–SiO$_2$ NANO COMPOSITE MATERIAL

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Water has a lot of potential to produce electricity with much constant voltage value. Hydro-turbines are usually used to operate at variable load due to different climate nature over the whole annum. Loadings are the reasons of vibrations which result in failures. In Francis Turbines loading are due to the fluid pressure and centrifugal force of runner. Problems failure occurs in different stages like: (1) changes in microstructure; (2) microscopic cracks formation; (3) microscopic flaws growth (dominant cracks); (4) dominant macro-crack propagate stably; (5) instability of structure/complete fracture.

In this thesis we are going to design the existing Francis turbine and optimize the design where the stress and the deflections are high for the existing design and even the material optimization is being done to get the better outputs. Structural and the modal analysis are used to get the outputs.

Optimization of the Francis Turbine to Get the Better Performance and To

Decrease the Vibrational Effects in the Loading Conditions

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DESIGN AND ANALYSIS OF VORTEX GENERATORS FOR REDUCING DRAG FORCE IN AUTOMOBILES BY USING CFD

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[2]Assistant Professor, Mahaveer Institute of Science & Technology, Vysapuri, Hyderabad, TS

Abstract: **In the modern day design of vehicles, especially in the automobile industry involves a great deal of aerodynamic design study to analyze the airflow. The aerodynamic drag force adversely affects the forward motion of the vehicle, which in turn reduces the efficiency. If the vehicle is redesigned to optimize the aerodynamic forces, it could produce better results but requires a huge capital to change the complete design. Here in this paper, we are going to use these vortex generators for the sedan modeled light weighed compact cars with various profiled designs and CFD.**

Keywords: **Vortex generator, Drag force, airfoil, CFD**

INTRODUCTION

A vortex generator is a device which is used to control the aerodynamic for the vehicles; it is present on the top surface of the vehicle. Generally these are been used in aerodynamic vehicles such as aircrafts and for cars. When the airfoil is in motion relative with the air, the vortex generator creates an vortex, which by removing the part of the slow moving boundary layer in contact with the airfoil surfaces delays local flow separation and aerodynamic stalling, thereby improving the effectiveness of the wings as flaps, elevators and rudders.

Vortex generators are mostly used to delay the flow of air separation which is travelling on the surface of the object. These are used on the external surfaces of the vehicle. These are commonly in rectangular or triangular in shape. These will be placed obliquely, so that they can acquire the angle of attack with respect to the air flowed on the vortex which creates an energy drawing on the tip moving outside in to the boundary layer in contact with the surface.

The study of air travel above the surface of a solid is called aerodynamics. When an automotive moves in a definite velocity the air flow over the car makes drag which is very undesirable for its performance. An automotive needs more power to overwhelm this drag force. When the aerodynamic stuff of the automotive is equipped to overcome this air resistance, the vehicle can move faster, longer and could be added fuel efficient for the vehicle. The vehicle could advance more down force thus providing better grip between the car and the road. The down force allowsthe vehicle to corner at high speeds. However here exists a balance for high speed because of the improved resistance. The aerodynamic stuff of the automotive can be altered by installing a vortex generator at the rear of a car.

Though the main focuses of vehicle manufacturers, many researchers have been focused on fuel saving strategies of the commercial and non-commercial vehicles till to date. As the numbers of passenger cars are being increased considerably in worldwide, it became an important to study the aerodynamic effects of vehicles. Henceforth in this work, the difference of pressure coefficient with respect to the dynamic pressure with different types of vortex generators (VG) on the roof of a sedan vehicle has been investigated.

EXPERIMENTAL DETAILS

Design of vortex generator

In order to discovery a viable configuration, one must first recognize the significant variables for vortex generator design. In order to decrease the degrees of freedom, most of the variables were stationary based on both analysis and references of previous researchers. A Single vane type delta (triangular) shaped was chosen. Due to their uncomplicatedness and widespread usage, the low drag device than any other type makes the vane type more suitable for attributing on the vehicle body. Delta shaped vortex were most usually used in aircraft wings. In linking with the height, the thickness of the limits were measured based on the assumption that the optimum height of the vortex would be almost near to the boundary layer thickness. Below Figure shows the velocity profile on the vehicle's roof. From Figure, the boundary layer thickness at the roof end directly in front of the separation point is found to be about 2mm. Consequently, the optimum height for the VG is estimated to be up to approximately 5mm. The thickness of VG was fixed at 2mm uniform throughout so as to make a stiffened structure.

CFD Analysis of the model using the necessary boundary conditions

CFD is a simulation of fluid engineering system which runs with a mathematical physical problem formulation and numeric methods such as solvers, numerical parameters, grids, etc., Basically we fluid oriented problems will be solved in the fluid analysis. Before that we need to know the physical properties of the fluid which we are going to use in our project. CFD has a lot of advantages are it has been using in the industries like aerospace, automotive, biomedicine, chemical processing, heat ventilation, HVAC, air conditioning systems, hydraulics, marine, etc.,.

In CFD the fluid used will be a liquid or gasses only. Here for these liquids we require the properties like velocity, pressure, temperatures, density, and viscosity.

Shake Table Experiment on Reactor Vessel

D.J.Johnson[1], G.Lavanya Lakshmi[2], B.AnushaSrikanta[3], S.Srikanth[4]

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Abstract: The importance of Nuclear Power Plants and the consequences of a nuclear accident require that the nuclear structures be designed for the most severe environmental conditions. As the Earth quake is one of the natural hazard that can cause extensive damage to human lives and property it constitutes major design consideration for the system structures and equipment of a Nuclear Power plant. In view of complex nature of analysis, experimental validation results on testing was done with 1/8th scale down model and main vessel with liquid on shake table (3m x3m, 10t capacity.
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Even though as a concept shake table appears simple, there are many critical points to be considered in planning of the shake table system. Some of these are indicated below.

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Two types of foundations are common, namely the fixed type and the floating type. The floating type is nearly two to three times as costly as fixed type. The natural frequency of the foundation-soil system lies normally in the range of 20 to 40 Hz. The fixed foundation requires larger mass than floating foundation. Transmission of vibration in to the environment is extremely low in case of floating foundation. Floating foundations have problems at low frequencies, and hence may pose problems for large size models.

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Shake tables of the first generation were made with concrete, and several high performance shake tables were with special grade aluminium because of their strength to weight ratio. How ever present day shake tables are invariably made of steel. The table tops are to well machine. The first frequency of the table with actuators should be well above the frequency range of operation.

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DESIGN OF HIGH SPEED APPROXIMATE MULTIPLIER USING ADDER COMPRESSORS

April 2019

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R Nagaraju

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References (8)   Figures (3)

Abstract and Figures

In this modern era, many of the digital systems are error resilient which allows us to take the advantage of approximate computations. This makes the use of replacement of exact computing units by their counterparts. Approximate computing can also decrease the complexity at the designing levels with an increase in performance and power efficiency. Adders and multipliers are the basic buildings blocks of many digital applications. These blocks can be approximated in several ways. Research works are on the rise at many levels on approximate computing. Approximation at designing level is more advantageous as the modifications at this level much easier than the preceding levels. A method of designing an approximate multiplier with a novel structure introduced in 16-bit adder compressor is proposed. The 16-bit adder compressor (AC) is designed with 8-2 adder compressors in general. The 8-2 adder compressor is designed with 7-2 and 3-2 adder compressors and half adders. The existing and proposed multiplier is designed using Xilinx 14.7 in the frontend. The speed of proposed multiplier 55.44% increase compare to Existing Multiplier.
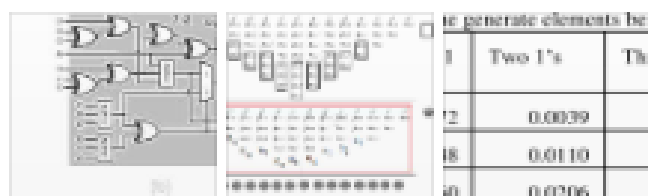
Adder compressors...

The Proposed approximate...

Generated signal Probability info

Abstract:

Location service is one of the primary services in smart automated systems of Internet of Things (IoT). For various location-based services, accurate localization has become a key issue. Recently, research on IoT localization systems for smart buildings has been attracting increasing attention. In this paper, we propose a novel localization approach that utilizes the neighbor relative received signal strength to build the fingerprint database and adopts a Markov-chain prediction model to assist positioning. The approach is called the novel localization method (LNM) in short. In the proposed LNM scheme, the history data of the pedestrian's locations are analyzed to further lower the unpredictable signal fluctuations in a smart building environment, meanwhile enabling calibration-free positioning for various devices. The performance evaluation conducted in a realistic environment shows that the presented method demonstrates superior localization performance compared with well-known existing schemes, especially when the problems of device heterogeneity and WiFi signals fluctuation exist.

A Design Flow of Multi Bit Flip-Flop Integration using Clock Gating

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Abstract: Data-Driven Clock-Gating (DDCG) and Multi Bit Flip-Flops (MBFFs) in which several FFs are grouped and share a common clock driver are two effective low power design techniques. Though commonly used by VLSI designers, those are usually separately treated. Past works focused on MBFF usage in RTL, gate-level and their layout. Though collectively coving the common design stages, the study of each aspect individually led to conflicts and contradiction with the others. MBFF internal circuit design, its multiplicity and its synergy to the FFs data toggling probabilities have not been studied so far. This work attempts to maximize the energy savings by proposing a DDCG and MBFF combined algorithm, based on Flip-Flops (FFs) data to-clock toggling ratio. It is shown that to maximize the power savings, the FFs should be grouped in MBFFs in increasing order of their activities. A power savings model utilizing MBFF multiplicities and FF toggling probabilities is developed, which was then used by the algorithm in a practical design flow. Simulation and synthesis reports are observed using Xilinx ISE design Suite, which shows much power savings in proposed when compared with traditional.

Keywords: Clock gating (CG), clock network synthesis, low-power design, multi-bit flip-flop (MBFF).

I. INTRODUCTION

A recently published paper has emphasized the usage of Multi-Bit Flip-Flops (MBFFs) as a design technique delivering considerable power reduction of digital systems. The data of digital systems is usually stored in Flip-Flops (FFs), each having its own internal clock driver. Shown in Fig. 1.1, an edge-triggered 1-bit FF contains two cascaded master and slave latches, driven by opposite clocks CLK and CLK. It is shown that most of the FF's energy is consumed by its internal clock drivers, which are significant contributors to the total power consumption.

The data of digital systems are usually stored in flip-flops (FFs), each of which has its own internal clock driver. In an attempt to reduce the clock power, several FFs can be grouped into a module called a multi-bit FF (MBFF) that houses the clock drivers of all the underlying FFs. We denote the grouping of k FFs into an MBFF by a k-MBFF. Kapoor et al.[1] Traditionally, digital control of SMPS was accomplished by applying a general purpose Digital Signal Processor (DSP). Apart from some limited applications, this approach is unsuitable in most industrial instances due to its many drawbacks and limitations. These include: the single arithmetic unit that limits the speed of computation resulting in a limited control bandwidth, excessive delays in a multi converter case, limited capabilities to generate non-sequential pulse as might be needed in non linear control, limited capabilities to achieve high resolution of the output driving signal and its degrading as the number of control channels increases, as well as other shortcomings.

Another approach to modern digital power management is a closed, dedicated controller for a specific application such as Voltage Regulator Module (VRM). The drawback of this approach is the fact that it is limited to the specific application for which it was developed. Hence, application of the unit to solve other power management problems is impossible since a new Application Specific Integrated Circuit (ASIC) design cycle needs to be initiated for every case reported a 15% reduction of the total dynamic power in a 90-nm processor design. Electronic design automation tools, such as Cadence Liberate, support MBFF characterization. The benefits of MBFFs do not come for free. By sharing common drivers, the clock slew rate is degraded, thus causing a larger short-circuit current

Design and Implementation of a Hybrid Lut/Multiplexer Architectures for Fpga

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Pragati Engineering College, Surampalem, East Godavari, Andhra Pradesh.

ABSTRACT: *Hybrid configurable logic block architectures for field-programmable gate arrays that contain a mixture of lookup tables and hardened multiplexers are evaluated toward the goal of higher logic density and area reduction. Multiple hybrid configurable logic block architectures, both nonfracturable and fracturable with varying MUX:LUT logic element ratios are evaluated across two benchmark suites (VTR and CHStone) using a custom tool flow consisting of LegUp-HLS, Odin-II front-end synthesis, ABC logic synthesis and technology mapping, and VPR for packing, placement, routing, and architecture exploration. Technology mapping optimizations that target the proposed architectures are also implemented within ABC. Experimentally, we show that for nonfracturable architectures, without any mapper optimizations, we naturally save up to ~8% area postplace and route; both accounting for complex logic block and routing area while maintaining mapping depth. With architecture-aware technology mapper optimizations in ABC, additional area is saved, post-place-and-route. For fracturable architectures, experiments show that only marginal gains are seen after place-and-route up to ~2%. For both nonfracturable and fracturable architectures, we see minimal impact on timing performance for the architectures with best area-efficiency.*

I.INTRODUCTION

Throughout the history of field-programmable gate arrays (FPGAs), lookup tables (LUTs) have been the primary logic element (LE) used to realize combinational logic. A K-input LUT is generic and very flexible—able to implement any K -input Boolean function. The use of LUTs simplifies technology mapping as the problem is reduced to a graph covering problem. However, an exponential area price is paid as larger LUTs are considered. The value of K between 4 and 6 is typically seen in industry and academia, and this range has been demonstrated to offer a good area/performance compromise [4], [5]. Recently, a number of other works have explored alternative FPGA LE architectures for performance improvement [6]–[10] to close the large gap between FPGAs and application-specific integrated circuits (ASICs) [11]. In this paper, we propose incorporating (some) hardened multiplexers (MUXs) in the FPGA logic blocks as a means of increasing silicon area efficiency and logic density. The MUX-based logic blocks for the FPGAs have seen success in early commercial architectures, such as the Actel ACT-1/2/3 architectures, and efficient mapping to these structures has been studied [12] in the early 1990s.

How ever, their use in commercial chips has waned, perhaps partly due to the ease with which logic functions can be mapped into LUTs, simplifying the entire

Multi Band Spectral Subtraction for Speech Enhancement with Different Frequency Spacing Methods and their Effect on Objective Quality Measures

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Abstract—This paper mainly studies Multi Band Spectral Subtraction (MBSS) for speech enhancement based on the spectrum representation in the frequency domain with three different scales(linear, log, mel) and their effect on performance measures in presence of additive non-stationary noise at different ranges of input SNR. Since speech is non-stationary signal, noise distribution is non-uniform i.e few frequency components are affected severely than others. A common method to restore the original speech in presence of noise is speech enhancement by suppressing the back ground noise. Multi Band Spectral Subtraction is one among the speech enhancement techniques which performs spectral subtraction by dividing noisy speech spectrum into uniformly spaced non over lapping frequency bands and spectral over subtraction is performed in each band separately. The performance of this method is evaluated in terms of objective measures such as Cepstrum distance, Log Likelihood Ratio, Weighted Spectral Slope distance, segmental SNR and Perceptual Evaluation of Speech Quality.

Index Terms—Speech enhancement, Multi Band Spectral Subtraction, Frequency Spacing Methods, Linear, mel, logarithmic, Objective Quality Measures

I. INTRODUCTION

To communicate ideas from one person to another in human communication is speech [1-3]. Real-world, environment is always surrounded by back ground noise which severely distorts the speech signal and it should be eliminated for further processing, One of the challenging task is Speech Enhancement which always have a scope for further improvement [2]. Speech enhancement plays a crucial step in important applications like voice command systems, Speech Recognition, Speaker identification, hands free systems and speech coding [3]. Based on the idea used, speech enhancement techniques are of different types. Based on the number of microphones used for speech acquition, speech enhancement techniques are of Single channel in which one microphone is used and the other is dual channel or Multi channel in which two micro phones are used. Based on domain of processing, Time domain and Frequency domain Speech enhancement techniques anddepending on the type of algorithm used adaptive and non-adaptive speech enhancement algorithms. Single Channel Frequency Domain Speech enhancement techniques are of more popular for personal communication because of its ease of implementation which involves forward and inverse transform.In the past, number of researchers proposed different speech enhancement methods. Most of them are based on Spectral Subtraction (SS), Statistical Model based, Sub space algorithms and Transform based methods. One of the popular noise reduction method which is computationally efficient and less complexity for single channel speech enhancement is Spectral subtraction proposed by Boll S.F for both Magnitude and Power Spectral Subtraction which itself creates a bi-product named as synthetic noise[1]. A significant improvement to spectral subtraction with over subtraction factor and spectral floor parameter to reduce the musical noise given by Berouti [2] is Non –Linear Spectral subtraction. Ephraim and Malah proposed spectral subtraction with MMSE using a gain function based on priori and posteriori SNRs [3]. Spectral subtraction based on perceptual masking properties of human auditory system proposed by Virag [4]. Another method in spectral subtraction with Wiener filter to estimate the noise spectrum is extended spectral subtraction by Sovka [5]. Spectral Subtraction algorithm based on two-band is Selective spectral subtraction described by He, C. and Zweig, G. [6]. Spectral subtraction with Adaptive Gain

A Structured Visual Approach to GALS Modeling and Verification of Communication Circuits

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Frank Burns ; Danil Sokolov ; Alex Yakovlev   All Authors

Abstract

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II. xMAS Modeling

III. Net Modeling of xMAS Circuits

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Design and implementation of low power 5 stage Pipelined 32 bits MIPS Processor using 28nm Technology

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processor. The operations used by MIPS processor in instruction set which are generally used to access memory in MIPS processor are load and Store and other operations which are remaining are performed on register to register basis [2] this results in more clear instruction set design where it allows execution of one instruction-per cycle rate. The pipelining uses parallelism at instruction level to execute multiple instructions simultaneously using a single processor [2]. The major disadvantage with MIPS processor design is dynamic power consumption results due to clock power and switching-activity. Clock Gating is a method which employed in the design to reduce power consumption [17] by reducing switching activity of non active blocks. Total power consumption results with switching activity, capacitance and voltage swing of the transistor and major component is Clock power with respect to overall dynamic power consumption, the effective usage of clock can minimize power consumption. Clock gating is method which disables the clock signals in case of modules that are no use of the total hardware. Nowadays the most important performance factor in embedded portable applications is to maintain trade of between power speed and area. Due to major advancement in technology towards low power devices design engineers have to compromise with area and speed.

II. ARCHITECTURE of 32 bits MIPS PROCESSOR

A. Single Cycle MIPS Processor

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Figure 1. Architecture of Single Cycle MIPS Processor

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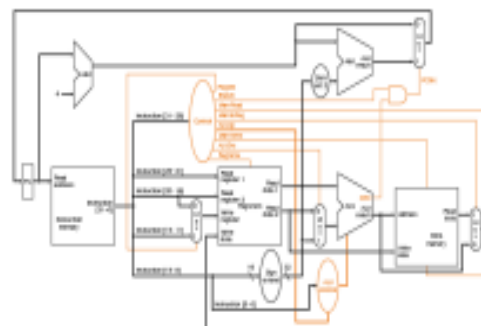The Design of MIPS Processor includes is as shown in figure:1

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Enhanced Fingerprinting and Trajectory Prediction for IoT Localization in Smart Buildings

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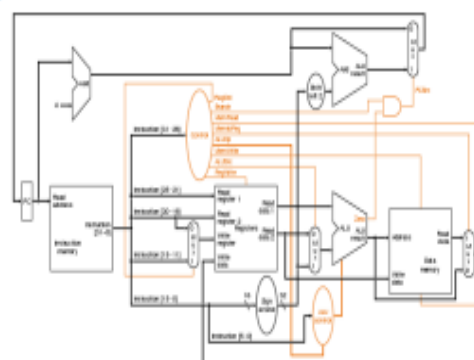

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Compact Printed Elliptical Microstrip Patch with Defected Ground Structure (DGS) for Wireless Applications

Dasari Nataraj[1*], G. Karunakar[2]

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Abstract

In this paper, the design of a compact microstrip antenna is proposed for wide bandwidth applications ranging from 2.4 GHz to 3.6 GHz. Defected Ground Structure (DGS) antenna design optimizes the structure and enhances the bandwidth and the return loss performance. Since communication systems prefer small sized broad band and multiband antennas- probe feed monopole is used to fabricate broad-band as well as wide-band antennas. Thorough investigations are carried out in the proposed work to design a new antenna for broad-band properties. Simulation based analysis is performed using Ansoft HFSS electromagnetic simulator software - fabricated on FR-4 Substrate and testing is performed using Vector network Analyzer. The simulation and measurement metrics proved that the proposed antenna is applicable in 2.49 GHz to 3.6 GHz frequency range with a return loss of 19.97dB and 19.05dB.

Keywords

Defected Ground Structure (DGS) Elliptical; Microstrip Antenna

Compact Printed Elliptical Microstrip Patch with Defected Ground Structure (DGS) for Wireless Applications

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Defected Ground Structure (DGS) Elliptical; Microstrip Antenna

Design and implementation of low power 5 stage Pipelined 32 bits MIPS Processor using 28nm Technology

V.Prasanth, V.Sailaja, P.Sunitha, B.Vasantha Lakshmi

Abstract— MIPS is a simple streamlined highly scalable RISC architecture is most used in android base devices and best suited for portable mobile devices. This Paper presents a design of 5 stage pipelined 32 bit MIPS processor on a 28nm Technology. The processor is designed using Harvard architecture. The most important feature of pipelining is performance and speed of the processor, this results in increase of device power. To reduce dynamic power using RTL clock gating inside FPGA device we presented a novel approach in this paper. Design functionality in terms of area power and speed is analyzed using kintex 7 platform board.

Keywords: RISC,MIPS, Clock Gating, Dynamic Power, FPGA,Pipeling

I. INTRODUCTION

For the past few decades MIPS processor played a major role in design of battery operated devices and is one of the major RISC processor which is delivering best performance with low power utilization in a given predefined silicon area .Cost and power saving are one of the significant features in designing SoC. Major difference between CISC and RISC processor is later uses instructions of less number and can be best used for embedded real time applications which occupies low are with high speed applications. Lot of research is going towards design of MIPS CPUs for smaller silicon area and lower power consumption. In This Paper we presented a MIPS processor using Harvard architecture. MIPS stand for "Micro-processor without interlocked pipeline stages" developed by 'D.A.Patterson' and 'J.L.Hennessy' is a computer architecture best suited for portable device applications. The main aim of this design is to create a faster processor using simple instruction set by including pipeline stages so latency can be reduced and speed is increased. Pipelining is a set of registers separated into 5 stages as fetch, decode, execute, memory access and write-back. Pipelining is a process of executing stage by stage with a clock synchronous network which helps in preventing loss of information and also enhance the speed performance of

Revised Version Manuscript Received on 30 May, 2018.
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processor. The operations used by MIPS processor in instruction set which are generally used to access memory in MIPS processor are load and Store and other operations which are remaining are performed on register to register basis [2] this results in more clear instruction set design where it allows execution of one instruction-per cycle rate. The pipelining uses parallelism at instruction level to execute multiple instructions simultaneously using a single processor [2]. The major disadvantage with MIPS processor design is dynamic power consumption results due to clock power and switching-activity. Clock Gating is a method which employed in the design to reduce power consumption [17] by reducing switching activity of non active blocks. Total power consumption results with switching activity, capacitance and voltage swing of the transistor and major component is Clock power with respect to overall dynamic power consumption, the effective usage of clock can minimize power consumption. Clock gating is method which disables the clock signals in case of modules that are no use of the total hardware. Nowadays the most important performance factor in embedded portable applications is to maintain trade of between power speed and area. Due to major advancement in technology towards low power devices design engineers have to compromise with area and speed.

II. ARCHITECTURE of 32 bits MIPS PROCESSOR

A. Single Cycle MIPS Processor

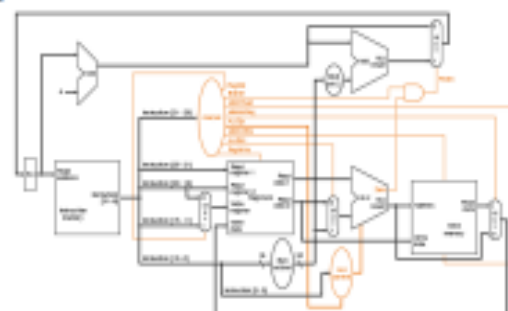The Design of MIPS Processor includes is as shown in figure:1

Figure 1. Architecture of Single Cycle MIPS Processor

Handling Multifacets of Trust Management in Cyber Physical Systems

Manas Kumar Yogi

Abstract: Trust should be learnt from history and context sensitive. It should not be absolute in nature. Due to the conglomeration of various technologies in a secure cyber physical system it is quite a challenge to handle trust issues in a cyber physical system. Trust management in cyber physical system is needed due to increase in the degree of autonomy, decentralized policies ,dynamic environment, decision-making based on social rules,customs,laws,values, and ethics. This chapter brings light into the existing strategies already applied by few organizations, their inherent benefits and consequent shortcomings too. There are many factors contributing towards the establishment, expression, evaluation ,maintenance of trustworthiness. In this chapter we advocate a novel framework for trust management which stands up to the research directions of how to build a unified framework for trust management, how to modify the way we compute trust, how to decide the right granularity for a trust model.

Keywords : Trust,, Policy ,Reputation, Request, Credential, Revocable.

I. INTRODUCTION

The developing many-sided quality of the artificial intelligence and the connection of autonomous areas, for example, flight, mechanical autonomy and car is a noteworthy block against a comprehensive view CPS. Moreover, expansion of correspondence systems have expanded the span of CPS from a client driven single stage to a generally circulated system, frequently associating with basic foundation, e.g., through shrewd vitality activity. Cyber Physical Systems (CPS) comprise of a mix of various installed subsystems, which work freely of one another and furthermore cooperate with the outside condition. Such implanted frameworks work within the sight of characteristic vulnerability, setting conditions and ill-disposed sureness emerging from both the cyber and physical universes. Security is one of the key ideas to shield the CPS condition and distinctive implanting gadgets with the end goal to have a dependable and secure correspondence stage. There are numerous security methodologies and strategies proposed and executed all inclusive with the end goal to anchor CPS, alongside regions, for example, social building, security measures, merchant control, and also get to control usage, and so on. Nonetheless, notwithstanding these zones, another essential idea, specifically trust, is noteworthy in guaranteeing secure and dependable correspondences in CPS. In the current best in class, none of the current methodologies talks about the issue of a protected, trust-based CPS. Along these lines, to address this weakness, in this paper, a two-level cover approach is proposed comprising of interior and outer layers of trust among various elements to make dependable and secure CPS. This trust-based structure enhances the certainty of secure substances joining the CPS framework and furthermore assembles connections among elements, along these lines expanding the security shielding the shaped CPS from outside dangers and assaults. Currently most of the trust in CPS are realized using following principles. First one is protecting critical infrastructure from malware threats by separating non-critical from critical operations and concentrating on using hardware isolation to protect control of physical systems. Secondly, Ensuring that any code that has critical operations must be auditable by operators through source code review. The third one accounts for the attestability of processing environment. During operation, each component must be able to verify that data is received and sent only from trustworthy sources. A component also needs to attest its trustworthiness to other components. The last one is minimizing number of entities that needs to be trusted. Reducing the number of trusted entities significantly reduces the attack surface for critical infrastructure. In the ideal trusted CPS solution, the operator will maintain the only root of trust for critical code execution. Social trust is extremely mind boggling and relies upon numerous variables, which makes is hard to display in a computational framework. A few variables which impact trust are: past experience with a man, association with the individual, suppositions of the activities a man has taken, psychological factors affected by a lifetime of history and occasions, talk, and influence by others' assessments. Much work has been done to formalize the idea of social trust into registering situations. There are three principle properties of assume that are significant to creating trust-based computational models: transitivity, asymmetry, and personalization . This exploration endeavors to display every social property in the processing condition to precisely reflect the thought of social trust. The possibility of transitivity is that social trust can be passed between individuals. For instance, Alice profoundly confides in Bob, and Bob very trusts Chuck, despite the fact that Alice does not know Toss, she could in any case determine some feeling of reliability for Chuck. In any case, trust is not splendidly transitive in the numerical sense, since it would not be the situation that Alice profoundly confides in Chuck, a man she has no past connections with. There has been much research in demonstrating the transitivity of trust, additionally alluded to as trust proliferation.

Novel Perspectives in Forensics Aware Internet of Things

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Abstract

The Internet of Things involves connecting various things with several communication standards and technologies. While Internet of Things opens accessible opportunities in many fields, it announces new threats in the sphere of forensics investigations. The present day procedures and forensic tools cannot fit the widely distributed infrastructure of the IoT. Forensics investigators will experience threats determining, analyzing and collecting that evidence. This paper comes with the working solution of IoT forensics and consistently evaluates the IoT forensics area to examine the threats and issues in this peculiar field of forensics. We recommend a Forensics-aware IoT (FAIoT) model for approving reliable forensics investigations in the IoT environment.

1. Introduction

The Computer forensics is an uninterrupted evolution. This discipline is adapting its approach, tools and methodologies to cover-up advanced contexts. IoT Forensics is the term to describe a modern branch of forensics devoted to the precise features of investigations in Internet of Things scenarios and its requirements. The adaptation of forensics to consider IoT scenarios is indispensable due to numerous characteristics making forensic analysis in the IoT differentiating from other contexts or paradigms. Actual forensic branches cannot be enforced to the requirements imposed by the IoT, namely: • Increase in numerous devices • Huge development of proprietary protocols • bulk of data, making the identification of particular data complex • Urge for advanced formats to supply evidence in IoT devices • Presence of numerous resource-constrained devices.

These threats results in a consequential effort being made towards the definition and implementation of forensic solutions in the context of IoT paradigm. Despite these efforts, forensics solutions have so far ignored the urge for securing individual privacy throughout investigations. This is true even though devices are known to be capable of collecting and storing large amounts of personal information as they are parts of our lives [1]. Not only are smart-phones utilized and deployed among individuals but also wearable's, smart gadgets, and numerous sorts of context-aware devices.

Forensic mechanisms and tools, similar to those utilized for the seizure of evidence at a crime scene, are prepared for static contexts, in which the voluntary participation of citizens is not required. In such scenarios, the conception of witness is applied to individuals, not to devices, or tools. In scenarios, similar to those envisioned by the IoT, the recovery of evidence is complex and it may be important for the investigator to get help from citizens and devices.

Without a cooperative approach it is complex to understand the whole context, since the information can be distributed and volatile information could otherwise be lost. This is where the conception of digital witness comes into play. Understanding the conceptual background of IoT, evidence and digital forensic are essentially important for conducting a proper investigation and comes-up with a proposal for enhancing the current research milestones in the field of IoT forensic.

1.1 IoT

Conceptual Consideration While the conception of IoT is not relatively very new, its targeted realization and implementation are yet to be done. It is claimed by different references that the term Internet of Things was initially coined by the director of ID-Auto Labs at MIT - Kevin Ashton in 1999[2]. The main concept of IoT is creating an overwhelming "things" with interoperability and communication ability via different suitable protocols such as Radio-Frequency Identification (RFID), Internet and Bluetooth. This kind of scenario is useful for various applications like smart cities, telemedicine, smart grids, intelligent vehicles and many other applications. Having explained the conception of IoT, it is important to elaborate on the issue of evidence acquisition from IoT. In general cases, the consideration of evidence starts by identifying the crime scene and any directly connected devices to the crime scene. In IoT, the issue is complex due to sophisticated inter-connectivity where it may seem difficult to reach the exact thing and in worse cases, it may be mistakenly considered. This leads to a numerous ramifications including delaying digital forensic process, misleading the investigation process, further developing the security risks by invading connected surrounding things and finally complicating forensic investigation process by adding a massive amount of exchanged data owing to dense inter-connectivity [3].

1.2 DIGITAL EVIDENCE

Digital evidence can be explained as any intended or unintended trace generated by an electronic device due to digital data movement. We use various electronic devices to approach the needed resources and conduct online and offline transactions every day. The idea is all these activities create a trail ranges from log files and browsing history to data movements such as digital files, online transactions and social media activities.

The created evidence may sound unworthy to Internet users and average electronic devices, yet evidence is complex than its counterpart generated from the current cyberspace. The bulk of data can be exchanged between things in IoT, numerous things are available at the crime scene, the second and third connectivity levels and interoperability of things do create a threat for forensic investigators in terms of identifying relative things in IoT, applicable digital forensic techniques and processing time [4].

The challenge may get more complicated here if the thing is implanted and cannot be seized or disposed of and cannot be retrieved for conducting the forensic analysis. Digital Forensic Digital forensic is characterized by the application of forensic science disciplines to electronic-based crime scenes followed by certain legal approaches [5].

The application of forensic goes back in time for multiple decades where it was originally restricted to computer crimes as the cyberspace had not gained its current popularity back then. The tenets of forensic are usually followed as a fundamental procedure of identifying related electronic devices, acquiring evidence in a verifiable manner, analyzing and preserving the acquired digital evidence, and finally presenting the evidence in a readable and organized format to be admissible before law.

The challenge here is applying this standard digital forensic procedure to IoT network where a blend of actuators, sensors, smart phones, embedded computing devices etc. are all interlinked to bulk of data exchanged between them. The issue begins with identifying

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Quantum Inspired Evolutionary Algorithm for Web Document Retrieval

Manas Kumar Yogi ✉ & Darapu Uma

Abstract

This paper describes the importance of quantum inspired evolutionary algorithm for web document retrieval. As size of web increases day by day the popular methods for web document retrieval are taking much time thereby making users concerned about it. Our approach takes inspiration from evolutionary algorithms to model a mechanism which returns experimental results with acceptable accuracy. We have seen from trial results that after some time the general capacity of proposed strategy is superior to the best two most well known methods of web document retrieval. The primary bit of leeway of utilizing our proposed calculation is that its presentation doesn't debase regardless of whether the search space is variable. Irrespective of whether search space is expanding or diminishing the exhibition doesn't drop for our proposed procedure. We discuss comparative performance of the proposed technique with other popular techniques in this area and conclude the paper with future scope of fine tuning the performance of the proposed mechanism with addition other parameters effecting the performance in the mechanism. In future we intend to refine the propose system to suit diverse web prerequisites like customized web search and furthermore for web document retrieval from centralized server databases as well.

Keywords

Quantum   Nature inspired   Evolutionary   Web   Retrieval   Semantics

Application Of Viterbi Algorithm For Efficient Transportation Forecasting

Manas Kumar Yogi, Koondrapu Koushik Sri Sai, Afreen Jaha

Abstract: This paper discusses a novel application of probabilistic models which can uncover a hidden sequence of states thereby helping us predict the transportation needs during time where people will travel in huge numbers. We advocate the application of Viterbi algorithm for serving our purpose. The Viterbi algorithm has been already applied in various domains with remarkable efficiency forcing us to think about its role in supporting development of robust prediction models for railway transport. Our paper enlightens the strength of Viterbi algorithm and how its efficiency is comparable to other prediction models which considers the standard factors only limiting their conclusive prediction power. The experimental results prove that our proposed strategy improves prediction accuracy significantly than other forecasting models.

Index Terms: Transportation forecasting, Viterbi algorithm, Hidden Markov Model, Prediction.

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1 INTRODUCTION

Transportation forecasting is the process of calculating number of people using a particular mode of transport.. For instance, a forecast may result in calculating the number of vehicles/people travel on a road or bridge etc. It begins with the collection of data on current traffic. These are used for several key purposes in transportation policy, planning, and engineering. In the late fifties has traditionally followed the four-step model or urban transportation planning (UTP) and implemented it on the mainframe computers[1]. Following the four-step model as root to our model we've built an algorithm which solves this problem. The four steps of the UTP are

I.   Trip Generation
II.   Trip Distribution
III.   Mode Choice
IV.   Route Assignment

. In addition to identify the forecasting, it is important to note that forecasting infuse every step. For forecasting such traffic for a user, we have come up with a model which uses the Viterbi Algorithm to predict the traffic, for instance who uses railway mode of transportation. Here our model takes input data such as vehicle availability, mode of transport, climate effect, ride fares, journey history of the user. The criteria and decisions of the above factors that we have taken into consideration are applied to the Viterbi algorithm to get the accurate traffic prediction.

2 I. PROPOSED MECHANISM

2.1 About Viterbi algorithm

This algorithm is the best dynamic programming algorithm to find the series of unrevealed states which is known to be Viterbi path[3]. In programming everything is updated in day to day life similarly the name Viterbi path is changed and the

new name that is evolved is convolution code. The Viterbi algorithm is used in decoding the Viterbi path or convolutional code. This algorithm is also known as maximum sum or maximum product algorithm. This algorithm is highly applied in fields like converting speech to text, recognition of speech and in many other fields[4]. This model is focused to forecast the effect of transport network over the future locations and then the effect of these new locations over the transport demand.

2.2 Importance of Viterbi algorithm

A Viterbi algorithm finds valid Viterbi code from a received signal. A Viterbi algorithm looks for the current state of the signal and the series of previous states to decide what the most likely true value of the current state is. It is particularly effective in preventing errors in digital communication over wireless and other transmission media[5]. The complexity of the algorithm is easily estimated: Memory: the algorithm needs M storage locations, one for each state, where each location must be capable of storing a length L(m) and a truncated survivor listing S(m) of the symbols Computation: in each unit of time the algorithm must make M2 additions at most, one for each existing transition, and M comparisons among the M2 results[6]. In the existing work the modeling processes considering the standard factors which direct prediction in the context of transportation forecasting. The factors used as model components are the

I.   Vehicle availability

II.   Time of the day

III.   The season of the year

IV.   Climate conditions

Hidden factors:

1. Climate of the day is hidden factor which can be derived from which month it is.

2. The occupancy of the vehicle can be derived from time of the day. During rush hour 8am to 6 pm IST the occupancy level will be high and vice versa.

The existing model need huge amount of historical data for transportation forecasting. Also, the prediction accuracy has been observed to be in the range of 60% to 80%. Our propose

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A Case Study on Design of Covid-19 Detection and Alerting System Using Machine Learning Techniques

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⬇ Download citation   🔗 Copy link

References (17)   Figures (1)

Abstract and Figures

Coronavirus or 2019-nCoV is not, at this point, pandemic but instead endemic, with in excess of 14 million complete cases all throughout the planet getting the infection. At present, there is no particular treatment or solution for Coronavirus, and hence living with the sickness and its manifestations is unavoidable. The connection coefficient examination between different needy and free highlights was done to decide a strength connection between every reliant element and autonomous component of the dataset before building up the models. The database is divided into two parts, 80% of the database is used for model training and the remaining 20% is used for model testing and evaluation. In 2019, early Coronavirus predictions is useful to reduce colossal weight on medical service panels through the diagnosis of coronavirus patients. In the proposed work in this paper, Naive Bayes, Decision tree, Support Vector Machine (SVM) and Artificial neural network (ANN) models are used for forecasting COVID-19 prediction and occurrences.
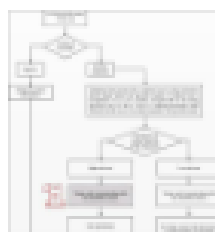
IoT Based Energy Meter with Measure Current, Voltage and Cost Monitoring

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Abstract: An automatic remote meter-reading system based on GSM is presented in this paper. This paper is useful to obtain meter reading when desired so meter readers don't need to visit each customer for the consumed energy data collection and to distribute the bill slips. Microcontroller can be used to monitor and record the meter readings. In case of a customer defaulter, no need to send a person of utility to cut-off the customer connection. Utility can cut off and reconnect the customer connection by short message service (SMS). Furthermore, the customer can check the status of electricity (load) from anywhere. In this system energy meter readings are being transferred by making use of GSM.

Keywords: Smart Energy Meter (SEM), Automatic Meter Reading (AMR), Global System for Mobile (GSM), Short Messaging System (SMS).

1. Introduction

Energy generation companies supply electricity to all the households via intermediate controlled power transmission hubs known as Electricity Grid. Sometime problems arise due to failure of the electricity grid leading to black out of an entire area which was getting supply from that particular grid. The project aims to solve this problem using IoT as the means of communication and also tackling various other issues which a smart system can deal with to avoid unnecessary losses to the energy procedures.

IoT smart energy grid is based on AT mega family controller which controls the various activities of the system. The system communicates over internet by using Wi-Fi technology. A bulb is used in this project to demonstrate as a valid consumer and a bulb to demonstrate an invalid consumer. The foremost thing that this project facilitates is reconnection of transmission line of active grid. If an energy grid becomes faulty and there is an another energy grid, the system switches the transmission lines towards this grid thus facilitating an interrupted electricity supply to that particular region whose energy grid went OFF. And this information of which grid is active updated over IoT Gecko webpage where the authorities can login and can be the updates. Apart from monitoring the grid, this project has the advance capabilities of monitoring energy consumption and even detects theft of electricity. The amount of electricity consumed and the estimated cost of the usage gets updated on the IOT Gecko webpage along with the Energy Grid information. Theft conditions are simulated in the system using two switches.

Switching one each time will simulate a theft condition and also will notify the authorities over the IOT interface. In this way, the Smart Energy Grid project makes sure that the electricity supply is continuous and helps in maintaining a updated record of consumption and theft information which is quite a valuable information for the energy producing companies. remote distance GSM communication system is much efficient than others. Auto billing is one of the suitable ways to overcome the flaws of conventional billing; since conventional billing contains wastage of time and resources as well. In auto billing there is no more need of manual meter reading and bill slips.

2. Problem Definition

1. Avoid the possibility of hacking the system, and basically, taking free electricity.
2. To prevent meter tempering.
3. Real-time Models and design methods describing reliable interworking of heterogeneous systems (e.g. technical/ economical/ social/environmental systems).
4. To reduce the human efforts, and to cut the power automatically if the bill is not paid.

3. Aim of Project

Sometime problems arise due to failure of the electricity grid leading to black out of an entire area which was getting supply from that particular grid. The project aims to solve this problem using IOT as the means of communication and also tackling various other issues which a smart system can deal with to avoid unnecessary losses to the energy procedures.

4. Objectives

1) Industrial data transmission, storage and distributed

Toward Ameliorating K-Means Clustering Algorithm

D. Sirisha ✉ & S. Sambhu Prasad

Abstract

Mining knowledge and predicting the behavior of the data have become major challenge with the advent of unprecedented escalation in the volume of the existing databases. Generally, clustering is adopted for voluminous and intricate data. In the present work, two techniques of K-means clustering, namely, K-means algorithm with random sampling (without realignment) and K-means algorithm with realignment sampling, are compared in terms of time taken and number of moves made for clustering the given data. The first one checks for any transfers between the clusters after inserting all the data. The second one is to check for any transfers between clusters for each new data inserted into cluster. The experimental results reveal that K-means clustering algorithm with realignment has performed reasonably well against K-means clustering algorithm without realignment.

Keywords

Data mining   Clustering   K-means clustering algorithm

IOT based Agriculture System Using NodeMCU

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Abstract - *Indian agriculture is diverse ranging from impoverished farm villages to developed farms utilizing modern agricultural technologies. Facility agriculture area in China is expanding and is leading the world. However, its ecosystem control technology is still immature, with low level of intelligence. Promoting application of modern information technology in agriculture will solve a series of problems facing by farmers. Lack of exact information and communication leads to the loss in production. Our paper is designed to overcome these problems. This system provides an intelligent monitoring platform framework and system structure for facility agriculture ecosystem based on IOT. This will be a catalyst for the transition from traditional farming to modern farming. This also provides opportunity for creating new technology and service development in IOT (internet of things) farming application. The Internet of Things makes everything connected. Over 50 years since independence, India has made immense progress towards food productivity. The Indian population has tripled, but food grain production more than quadrupled there has thus been a substantial increase in available food grain per ca-pita. Modern agriculture practices have a great promise for the economic development of a nation. So we have brought-in an innovative project for the welfare of farmers and also for the farms. There are no day or night restrictions. This is helpful at any time.*

Key Words: IoT, Smart Agriculture, Humidity, Temperature, Soil Moisture, Arduino.

1. INTRODUCTION

Smart Agriculture developing model is a real time monitoring system It monitor the soil properties like temperature, humidity soil moisture PH etc. It is possible to control many operations of the field remotely from anywhere, anytime by IOT. It offers a futuristic way of life in which an individual gets to control his electronic devices using a smart phone, it also offers an efficient use of energy. It applied in all areas of industry, including smart agriculture, smart parking, smart building environmental monitoring, healthcare transportation and many more.

2. LITERATURE SURVEY

In the existing system of agriculture, the crops are being monitored with the help of Arduino boards and GSM technology where in Arduino boards acts as a microcontroller but not as a server. Hence in order to overcome all these features Arduino Nano boards or renesas microcontrollers are being included with the NodeMCU which a latest version is and also acts both as a microcontroller as well as server. Main feature of this methodology is its cheap cost for installation and multiple advantages. Here one can access as well as control the agriculture system in laptop, cell phone or a computer.

3. PROBLEM STATEMENT

The proposed paper aims to supply water when farm is dry without human presence and avoiding water wastage in irrigation process. Also monitor the soil parameters like temperature, humidity and soil moisture level. It will also be possible to control various operations of the field remotely from anywhere, anytime by mobile as well as web application.

This gives signals to the mobile phone whether to send water (that is when farm is dry) to the field or not.

4. PROPOSED SYSTEM

The smart agriculture model main aim to avoid water wastage in the irrigation process. It is low cost and efficient system Is shown below.

It includes NodeMCU, Arduino Nano, sensors like soil moisture and Dht11, Ssolenoid valves, relays.

NodeMCU: NodeMCU is an open source IoT platform. it includes firmware which runs on the ESP8266 Wi-Fi SoC from Expressive Systems, and hardware which is based on the ESP-12 module.

Fig:1 NodeMCU

The term "NodeMCU" by default refers to the firmware rather than the dev kits. The firmware uses the Lua scripting language. The programming code is being written for ESP8266 Wi-Fi chip using Arduino IDE, for which installation of ESP8266 library is required. We designed to make

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A Review on Use of Plastic in Construction of Roads

Authors:

N Sai Sampath   Ch Suresh   A Phani Bhaskar

Chada Jithendra Sai Raja
N S Engineering Company Pvt Ltd

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Abstract

The global plastic production is increasing rapidly with rise in population and changes in life style. This makes the disposal of plastic is becoming complicated because of the non-biodegradable property. So it is better to recycle than disposal. One of the trend in recycling of plastic is use in construction of roads. This type of recycling can also help in protecting the environment from the greenhouse gases that are exposed to atmosphere while disposal. The waste plastic in form of bottles, cups, caps, etc are made in form of powder or blended with crusher and coated over the aggregate and bitumen mixture by heating process for roads construction. This polymer coated aggregate and bitumen mixture shows high strength, better binding property, stability, and increase in wear resistance, better durability and tear of roads. This makes the recycle of plastic in an efficient manner.

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Design and Fatigue analysis of Steering Components

June 2020

Authors:

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Abstract

The manual Rack And Pinion are widely used in the steering system due to its obviousness in design and manufacturing. In Rack and pinion the part that experiences maximum fluctuation in load on pinion, pinion shaft and steering intermediate shaft. In this paper the static analysis of pinion and pinion shaft with AISI 4130 is carried out and a comparison of fatigue analysis of pinion & pinion shaft with AISI 4130 & ASTM A36 is carried out. The intermediate shaft is analyzed with AISI 4130, ASTM A36, Al 4032 & Al 201.The primary modeling is carried out in SOLIDEDGE software and the analysis is carried out in CATIA V5. The objective of the study is to optimize the design and increase the life of steering components.

Numerical Simulation for Heat Swapping Behavior on Various Pipe Geometries

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Abstract

The forced flow behaviour for a grooved geometry attached with a nozzle has been analysed in the current study. A geometry with triangular g having different angles of convergence. The angle of convergence has been restricted to a range of 10° to 90°. These geometries with the swapping contours using the ANSYS – FLUENT software. The analysis depicted the results accordingly by the applied conditions using the softw geometry with 45° convergence angle of the nozzle as the optimum one as it has depicted the maximum deviation in terms of the heat swapp considered as the best one, i.e,. the mean geometry for both. The generated software results has been compared with the regression data maximum accuracy thereby declaring that both the data are in good correlation with each other. These comparisons can be applied to larger mo

Keywords

Pipe Geometry, Nozzle, Heat Exchangers, Grooves.

Optimization model of renewable source water pump using fuzzy logic controller

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Abstract

This paper discusses about the optimization of solar renewable source water pump. A novel method of water level regulation is provided based on a Fuzzy logic controller. The main objective of this paper is to supply the water according to the needs of the users regardless of dynamic variations in the climatic conditions. The paper focuses on the design and optimization of the power generated from the Photo Voltaic Generator and to regulate the water in the tank. A fuzzy logic controller is used to control the solar water pumping system. The controller generates the reference speeds necessary for the PWM generator to control each DC/DC boost converter considering water levels in three tanks and instantaneous value of the solar radiation. The performance of the controller is tested on a mini residential apartment . The system performance is tested using MATLAB/ SIMULINK environment

Keywords: *DC/DC boost converter, Fuzzy controller, PMDC motor and Solar water pumping system.*

1. Introduction

Recent years, the world is utilizing the solar power applications to every field. They play a major role in agricultural purposes as irrigation systems.The world is facing problems in delivering water to the communities and to the agricultural fields because of deficit in electricity and due to added high price of diesel fuels. So an alternative should be adopted for the supply of water requirements which can be implemented with solar systems.The electrical energized motors driven adoption in renewable photovoltaic water pumping system is one of the most popular methods.

 As agricultural technology is changing promptly day to day in the farm machinery, small holding building and manufacture conveniences, many works were being studied in applying the solar water pumping networks. A solar focused water pumping system is construction of PV panels and pumps as basic components. In order to control and enhance the pumping system, many works are done on the choice of the drive system to border to the PV source, such as dc motor, induction motor, synchronous motor. Dc motors are used because they offer cool operation with reduced conversion and little power consumption Thus, the optimization of both using PV power and adjusting the system is presented the persistence of more researches. Renewable energy sources, such as PV, wind, biomass sources and be used in water pumping system.[1].Many technical studies are worked in PV water-pumping systems as discussed in [2]. Previous analysis highlighted the ancient development of PV water-pumping control [3]. Many mechanisms are also developed in sizing PV water-pumping systems [5]. The voltage and current of PV cell is affected by the temperature and irradiation The voltage has positive effect on temperature and current has negative effect. Therefore the maximum point is to be tracked and several works are done in extracting maximum power point tracking (MPPT techniques) in solar cells [6]. A fuzzy control MPPT is developed where the controller generates a control signal for the PWM generator which fine-tunes the duty ratio of the buck chopper to maximize the motor speed and the water discharge rate of centrifugal pumping [7].In the present paper, designing and optimization of Solar Water Pumping System in a real time with fuzzy control is developed. It consists of PV modules connected to pumping motors through boost converter, with the water tank. Here a new technique with fuzzy control is implemented where it applies its efficiency in control of speeds as outputs of the motors by taking solar radiation and water level feedback as inputs. The fuzzy controller in water pumping system is applied in real time and tested for its efficiency. The implemented system with fuzzy controller is suitable for rural communities and an agricultural field for cattle sheds because it is very consistent, reasonable and quiet simple to sustain.

Voltage Regulation of Hydro Standalone 1-Φ Micro Grid using Fuzzy Logic Based Adaptive Sliding Mode Control Algorithm

Ramya Vasamsetti, S. Varalakshmi, M. Mangalakshmi

Abstract: This paper presents an adaptive sliding mode control (ASMC) of an improved power quality standalone single phase microgrid system. The proposed microgrid system integrates a governor-less micro-hydro turbine driven single- phase two winding self-excited induction generator (SEIG) with a wind driven permanent magnet brushless DC (PMBLDC) generator, solar photo-voltaic (PV) array and a battery energy storage system (BESS). These renewable energy sources are integrated using only one single-phase voltage source converter (VSC). The ASMC based control algorithm is used to estimate the reference source current which controls the single-phase VSC and regulates the voltage and frequency of the microgrid in addition to harmonics current mitigation. The proposed ASMC estimates the reference real and reactive powers of the system, which is adaptive to the fluctuating loads. The sliding mode control is used to estimate the reference real power of the system to maintain the energy balance among wind, micro-hydro, solar PV power and BESS, which controls the frequency of standalone microgrid. The proposed microgrid is implemented in real time using a DSP (Digital Signal Processor) controller. Test results of proposed microgrid shows that the grid voltage and frequency are maintained constant while the system is following a sudden change in loads and under intermittent penetration of wind and solar energy sources.

Index Terms: Standalone Microgrid, Renewable Energy Source, Single Phase SEIG, Battery Energy Storage System (BESS).

I. INTRODUCTION

HE benefits of an integration of renewable energy sources like wind, solar and micro-hydro with BESS (Battery Energy Storage System) are currently well recognized. The function of microgrid as controlled entities explores the possibility of coordinating standalone renewable energy sources so that they behave as a single producer of electrical energy to avail the full advantages of renewable energyresources in a consistent and manageable way.The energy balance and system parameters control are the key features of the microgrid.In order to achieve proper integration of renewable energy sources (RES), the development of effective frequency and voltage control scheme is essentially desired [1] - [2]. The concept of microgrid is most interesting for successful dealing with the challenges in the integration of renewable energy sources [3]. A microgrid is having capability to operate in both standalone and grid tied modes operation depending upon the design of suitable control scheme [9] - [10].

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The various derived forms of the microgrid such that virtual power plant, cognitive microgrid and active distribution system can be studied as a main constituent of smart grid [4] - [8]. In grid tied microgrid, the main grid supplies the deficit power and absorbs the surplus power in a grid tied microgrid in order to maintain power balance which in turn regulates the system frequency. Whereas, in a standalone microgrid, the balance of active and imaginary powers, is achieved using controlling the flow of power among different components of the microgrid[9] - [10]. An IEEE standard for interconnection of distributed energy sources are given in [11]. The voltage, frequency, real and imaginary powers are the main system variables required to control the operation of the microgrid [11]. BESS allows the large scale integration of intermittent energy sources [12]. Despite of its benefits, the capacity of BESS is not fully utilized in the microgrid system yet [13]. Power electronic control of integrated renewable systems has been discussed extensively in [14] - [15]. A comprehensive review of control of power electronic converters used in microgrid is presented in [16]. The main challenge in control of standalone microgrid includes the balance of powers and control of system voltage [17]. NABC and other control schemes of single-phase SEIG feeding fluctuating loads is reported in [18-22]. The comparison among photovoltaic array maximum power point tracking techniques are discussed in [23]. In this paper, the design and implementation of an adaptive sliding mode control (ASMC) algorithm [24] of single-phase microgrid system is proposed. It consists of three main renewable energy sources such as micro-hydro, wind and solar PV based generation.

- The main contributions and advantages of proposed system are as follows.

The adaptive sliding mode control (ASMC) eliminates all possibilities of overshoot and undershoot problem in DC link voltage of the VSC which reduces the required size of DC link capacitor and BESS. The proposed control reduces the size required for DC link capacitor connected across the BESS. The proposed control never allows the increase of DC link voltage above the maximum float charge voltage that increases the life of the battery. The proposed sliding mode based control used for power balance is found highly suitable, stable and robust for such highly nonlinear microgrid system where the multiple parameters vary in a very large range.

241

Development of Soft-Switching PWM Full Bridge DC–DC Converter with Charging Applications

Meenavalli Harikrishna, Madugula Satya Harish, M.Veera ChandraKumar

Abstract*: *This paper proposes a high-frequency-link soft switching pulse-width dc–dc converter for battery chargers. Zero-voltage switching of power switches is achieved from light load to full load. Reverse recovery losses can be reduced in the secondary side output diodes without using any additional circuit components. Zero-current switching of output diodes is achieved by using the series-resonant circuit in the secondary side .The circulating current in the primary side full-bridge circuit can be changed by the operation modes of the output diode current. As a result, a high efficiency can be achieved for EV on-board battery chargers. The performance of the proposed converter is evaluated throughout Matlab Simulation results for a 2.0-kW circuit

Keywords : *DC–DC Converter, High Frequency Link, Battery Charger*

I. INTRODUCTION

As generally recognised electric vehicles can achieve higher energy conversion efficiency, motor-regenerative braking capability, fewer local exhaust emissions, and less acoustic noise and vibration, as compared to gas-engine vehicles. The battery has an important role in the development of electric vehicles (EVs) and plug-in hybrid electric vehicles (PHEVs).

Fig.1 Electric vehicle and its main modules

An EV shown in Fig..1 [1] is a vehicle propelled by electricity, unlike the conventional vehicles on road today which are major consumers of fossil fuels. This electricity can be either produced outside the vehicle and stored in a battery or produced on board with the help of fuel cells (FC's). The development of EV's started as early as1834 when the first batterypowered EV (tricycle) wasbuilt by Thomas Davenport [2],which appeared to be appalling, as

it even preceded the invention of the ICE based on gasoline or diesel fuel. The development of EV's was discontinued as they were not very convenient and efficient to use as they were very heavy and took a long time to recharge .Moreover, from the end of the year 1910, they also became more expensive than ICE vehicles .This led to the development of gasolinebased vehicles However, there are concerns over the depletion of fossil fuel and green house gases causing long term global crisis like climatic changes and global warming. These concerns are shifting the focus back to development of automotive vehicles which use alternative fuels for operations .The development of such vehicles has become imperative not only for the scientists but also for the governments around the globe as can be substantiated by the Kyoto Protocol which has a total of 183 countries ratifying it (As on January 2009). The BEV has been since few years a very attractive research area both by car manufacturers and scientific researchers. The system architecture of HEV/EV

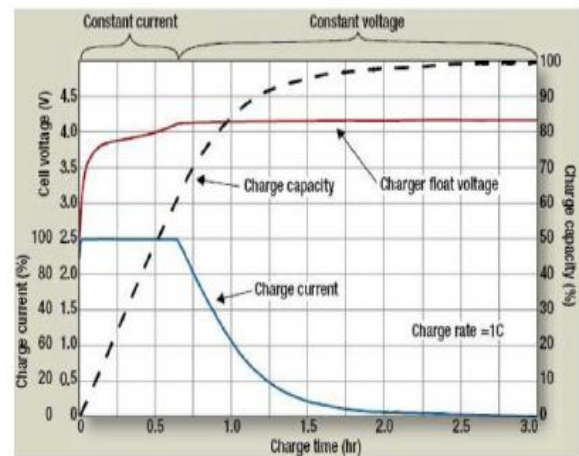**Fig. 2 Typical charging profile of Li-Ion cel**

B. Charger Classifications

Since theinception of thefirst EVs,there havebeen many different charging systems proposed. Due to many different configuration so fthechargers, itisrequired to classify them based on some common design and application features.Table1.1 [6] lists fivedifferent methods of classifying chargers Battery charger classification

Design of Full-Bridge Modular Multilevel Converter with Low Energy Storage Requirements for HVdc Transmission System with Fuzzy Inference System

Sheik Rasheed, Ch.Pavan Kumar, M.Mani Shankar

Abstract: This paper proposes a hierarchical Fuzzy Interface System (FIS) Predicated control architecture designed for an arbitrary high voltage multi terminal dc (MTDC) network. Modular multilevel converter (MMC)is a well-proved circuit topology in voltage-source converter-based high voltage direct current (VSC-HVdc) transmission systems. As is known, the conventional half-bridge submodule (HBSM)-based MMC-HVdc is not suitable for overhead line transmission applications. In addition, high energy storage requirements, i.e., large capacitance is inevitable. The conventional design of the full-bridge submodule (FBSM)-based MMC usually does not utilize the negative voltage state of FBSM in normal operation. Considering the same dc voltage as with the HBSM case and utilizing the negative voltage state of the FBSM, this paper presents the design method of the power transmission capability of a single FBSM. Meanwhile, an optimized energy storage capacitance design method of the FBSM is proposed. With this method, the capacitance of FBSM can be reduced significantly. The correctness and effectiveness of the proposed method is verified by the simulation of a±160kVVSC-HVdc MMC and the comparison results of the dc short fault blocking and ride through capability are also provided.

Keywords— Fuzzy controller, HVdc system, modular multilevel converter (MMC), droop control systems, power quality.

I. INTRODUCTION

In high voltage direct current (HVdc) transmission applications, voltage-source converter (VSC) is superior to conventional line commutated converter in terms of constant dc voltage polarity, independent control of active and reactive power, no problem of commutation failure and so on [1], [2]. Modular multilevel converter (MMC) which was first presented by Marquardt in 2003 [3] is a promising converter topology. Compared to the conventional two-level or three-level converters, MMC is an attractive circuit topology in high voltage and high power applications, due to its low harmonics, scalability, high reliability, and high efficiency [4]–[7]. Hence, MMC is widely adopted in many VSC-HVdc transmission projects [8].

When dc short-circuit fault occurs, the voltage of dc positive and negative voltage becomes almost zero. Low impedance leads high ac currents to flow through the freewheeling diodes from the ac side to the dc side even when all power devices are turned off [9]. The arm currents increase rapidly causing serious damage to the MMC. Hence, how to deal with the dc short-circuit faults is one of the main concerns in HVdc transmission systems, especially in the overhead line applications. Generally, there are two methods about handling the dc short-circuit faults in order to ensure safety operation of the MMC. The first one is the ac or dc circuit breaks (CBs) employed so as to disconnect the MMC from the fault point or ac-side grid. The response of the conventional ac CBs is not fast enough for fault isolation [10]. The power devices bear excessive current stress during the responding time. Several solid-state dc CBs have been proposed in [11]–[13] which can cut off fault current in a very short period of time. However, the dc CBs are extremely expensive and the on-state operational losses are significantly high owing to the power devices in the current path [14]. Hence, the dc CB is still very far from the wide range of applications.

II. DESIGN OF PROPOSED SYSTEM

A. System Configuration

The proposed system modelled on the Matlab / Simulink platform to improve the performance of the fuzzy inference MMC based HVdc system as shown in Fig.1. Compared with the traditional logic systems, fuzzy logicis very close to human thinking and natural language. Fuzzy control which is based on this fuzzy logic, provides an effective means of extracting the inexact nature of the real system. FL controller isbased on a set of linguistic control rules and is related by the dual concepts of fuzzy implication and the compositional inference rule. The above mentioned controller provides a sequence of operations tobe performed to convert the linguistic control strategy based on expert knowledge into an automatic control strategy. The results obtained bythe FLC are more accurate than those obtained by the conventional controllers. These fuzzy logic based controllers are well suited for applications involving complex analyses or when the available sourceof information involves uncertainty or in exactness.

Performance Improvement of the Grid Connected PV Inverter System with ANN Controller

Sankara Phani Dileep Malyala, Sravani Sattimsetti, P.V.Prasuna

Abstract*: *The implementation of the PV system and its integration into the grid has been increased. In this process some power quality issues arise i.e. harmonics, voltage sags / surges, interruptions, flickers, transients, and this is due to non-linear loads, arc furnaces, frequent starting / stopping of electric motors, oscillating loads and interactions of different semiconductor devices. Within these interharmonics is one of the emerging power quality issues in grid-connected photovoltaic (PV) systems. Based on previous case studies and field measurements, evidence of interharmonic emission from maximum power point tracking is one of the leading causes of interharmonics in PV inverters. In this regard, MPPT parameters such as sampling rate and perturbation step size have a strong impact on the interharmonic characteristic of PV system, and to overcome these problems, a mitigating solution has been previously proposed , namely modifications of the MPPT algorithm so as to randomly select the sampling rate between the fast value and the slow value. By implementing this technique with an artificial neural network controller for the control of the inverter. With the proposed method, the voltage perturbations of the DC-link voltage as well as the harmonics of the grid currents are reduced and the performance of the MPPT and PV system has been increased. The performances of the proposed system has been validated on a MATLAB / SIMULINK software environment.

Keywords*: *Inverters, Interharmonic, maximum power point tracking (MPPT), photovoltaic (PV) systems, power quality, Artificial neural networks(ANN).

I. INTRODUCTION

The penetration of PV systems is increasing day by day, and at the same time challenging problems related to the grid, integration has emerged over the past 20 years. One of the emerging problems with the power quality of grid-connected Photovoltaic systems is the interharmonics. Interharmonics are defined as the non-integer times of the fundamental frequency [6]. Inverters are the potential source of interharmonic emissions for Photovoltaic systems observed both within the field measurements and the laboratory test environment [7] - [11]. The interharmonic emission limit is still under development and it can cause voltage flickering, fluctuations, and unintentional disconnection of PV systems. Therefore, interharmonic emissions should be avoided in PV systems, and for which a reduction is also required [12]. The maximum power point tracking (MPPT) [8] - [11] is one of the most important causes of the interharmonics in PV systems, by which the disturbance of the voltage of the PV

arrays during the tracking of the maximum power point (MPP) inevitably causes an intrinsic error caused are power fluctuations on the DC side, especially during steady-state operation. Based on the above analysis, a mitigating solution proposed for interharmonics in PV systems is nothing but randomly switching operation between a fast and slow sampling rate of the MPPT- Algorithm [12] in conjunction with the control of the artificial neural network [2] - [3] for the DC- link voltage control. This ANN control strategy is used to reduce the steady-state error and improve the ability to suppress harmonics and the rise time in the control. Therefore, the interharmonics within the output current are effectively reduced due to the distribution of the frequency spectrum and also peak overshoots in an output current that has been reduced due to the reduction in the DC-link voltage perturbation. This paper discussed the design of the proposed system and performance characteristics of the PI Controller Model in Section II, Modified Control Scheme in Section III. Simulation results & Analysis and conclusions are elaborated in Section IV and V respectively.

II. DESIGN OF PROPOSED SYSTEM

A. System Configuration

The proposed system modelled on the Matlab / Simulink platform to improve the performance of the 1-Φ grid-connected photovoltaic inverter system as shown in Fig.1. The Random sampling technique [1][18] is implemented here to enhance the MPPT algorithm[14]tracking performance. The single-stage converter offers good efficiency, lower cost, and easier to implement. With this proposed model, the operation of the inverter control is can be done with a technique of DC-link voltage controller as well as the current controller. In this DC-link voltage control strategy, ANN[2]-[3] was implemented to reduce steady-state errors, harmonics rejection capability, and improvement in the rise time of the system. Whereas PR current control strategy to be used for zero steady-state error under the stationary reference frame using the PLL technique. The LCL filter is employed between the grid and the inverter to attenuate the switching frequency harmonics produced through the inverter connected to the grid, it additionally has higher attenuation functionality of excessive order harmonics and higher dynamic characteristic.

Revised Manuscript Received on December 25, 2020.
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A Droop Control Strategy for Minimization of Circulating Current in Low-Voltage Dc Micro grid

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Abstract

Micro grid system is formed to provide reliable electricity and heat delivering services by connecting distributed generations and loads together within a small area. Low-Voltage Dc Micro grid faces problems on load sharing and circulating current issues of parallel-connected dc–dc converters in low-voltage dc microgrid .microgrids can help overcome power system limitations, improve efficiency, reduce emissions and manage the variability of renewable sources.Droop index (DI) is introduced in order to improve the performance of DC micro grid, which is a function of normalized current sharing difference and losses in the output side of the converters.The proposed fuzzy based droop control method minimizes the circulating current and current sharing difference between the converters based on instantaneous virtual resistance .This results shows difference between pi and fuzzy and it is implemented using MATLAB/SIMULINK

Keywords: Micro grid ,Converters ,Drop control

1. Introduction

The concept of Micro grid has been introduced for sustainable energy generation and proper utilization of small-scale distributed energy resources (DERs). When DERs such as solar, wind, and fuel cell are connected together, its energy management becomes important [1]. It is not necessary that these energy sources exist in the same site but can be scattered depending upon the ease of energy harness. Integrating DERs to a common ac or dc grid through power electronic interfaces gives flexibility in conversion and power level. One of the main advantages of micro grid is that, it can be operated in islanded or grid-connected mode [2]. Several effective control strategies have been developed and implemented to integrate DERs to existing power grid [3]–[5]. The control of ac micro grid deals with the power flow, load sharing, voltage regulation and mitigation of various kinds of power quality issues [6]; whereas, in dc micro grid, power quality issues such as reactive power and skin effect are not present. There are several control issues related to the micro grid, including interconnection schemes between DERs and common dc grid, voltage control among parallel converters, load sharing, maximum power point tracking, and energy storage [9], [10]. Among these, this paper focuses on the voltage control and load sharing between different DERs connected through dc–dc converters to a common dc microgrid. The problems associated with voltage control are poor load sharing and circulating current between converters [12]. The reasons for variations from the constant output voltage power, load, parametric variations, and error in voltage and current feedback. The circulating current issue will arise if there is a mismatch in the converters output voltages. Several load sharing methods

Control & Design for FOPID Based Line-Side Converter of the Brushless Doubly-Fed Induction Generator

Hazara Begum, K. Sandhya Rani, V. V. Manga Lakshmi Chinni

Abstract-This paper deals with the operation of doubly fed induction generator (DFIG) with an integrated active filter capabilities using grid-side converter (GSC). The main contribution of this work lies in the control of GSC for supplying harmonics in addition to its slip power transfer. The rotor-side converter (RSC) is used for attaining maximum power extraction and to supply required reactive power to DFIG. This wind energy conversion system (WECS) works as a static compensator (STATCOM) for supplying harmonics even when the wind turbine is in shutdown condition. Control algorithms of both GSC and RSC are presented in detail. The proposed DFIG-based WECS is simulated using MATLAB/Simulink.

Keywords— Doubly fed induction generator (DFIG), integrated active filter, nonlinear load, power quality, wind energy conversion system (WECS).

I. INTRODUCTION

Wind ower is the conversion of wind energy into a suitable form of energy, such as using wind turbines to generate electricity, windmills for mechanical ower, wind pumps for water pumping, or sails to propel ships. The total amount of economically extractable ower available from the wind is considerably more than present human ower use from all sources. Wind ower, as an alternative to fossil fuels, is abundant, renewable, widely spread, clean, and produces no greenhouse gas emissions during operation. Wind ower is the world's rapid growing source of energy.Currently, a huge amount of doubly-fed induction generators (DFIGs) in high-power wind turbine-generators (WTGs) are operational as distributed generators (DGs) units in microgrids. Recent grid codes require a WTG remains operational during transient and steady state unbalanced grid voltages.A voltage unbalance can steadily exist in a microgrid due to unequal impedance of distribution lines, nonlinear loads such as arc furnaces and unequal distributions of single-phase loads.A distributed intelligent residential load transfer scheme was proposed to dynamically reduce voltage unbalance along low voltage distribution feeders. However, due to using widely distributed and variable loads such as single-phase motors, and nonlinear loads in a microgrid, the voltage unbalance

condition cannot be completely mitigated. On the other hand, even a small amount of voltage unbalance can cause notable current unbalance in a DFIG. This current unbalance causes torque pulsations and overheating of the machine windings which eventually reduce the lifetime of a DFIG-based WTG in a microgrid. Modeling and vector control of DFIG-based wind turbine under unbalanced conditions in microgrids are widely addressed in literature.The existing unbalanced vector control schemes for DGs conventionally use two pairs of individual controllers for the positive and negative sequence components of unbalanced currents.Tuning of these controllers due to the delays of the decomposing positive/negative sequences filters often requires complex algorithms in unbalanced vector control schemes.Alternative methods have been introduced which directly process the unbalanced rotor current without decomposition into positive/negative sequences. However, in these methods, the calculation of current references based on the ower pulsations also requires the positive and negative sequence components of the machine stator voltage, current, and flux. Direct ower control (DPC) methods have been also suggested for unbalanced voltage condition which relatively reduce the complexity of the control method compared to the vector control scheme.However, the DPC methods similar to the unbalanced vector control methods still need decomposition of positive/negative sequences and compensation for the filters delays. This project presents a control method for a DFIG connected to an unbalanced grid voltage, which uses the instantaneous real/reactive powers as the state variables. The proposed control approach offers a robust structure since its state variables are independent of the positive/negative sequences of the DFIG current components.The suggested control scheme also reduces the DFIG torque/power pulsations by using the real/reactive ower commands of the rotor-side converters in a DFIG wind energy system. Furthermore, at low wind speed and high unbalanced grid voltage conditions, the excess capacity of grid-side converter can be used for partial compensation of unbalanced stator voltage.

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Retrieval Number: 100.1/ijeat.B20731210220
DOI:10.35940/ijeat.B2073.1210220

148

Published By:
Blue Eyes Intelligence Engineering
and Sciences Publication

An Optimization Technique for Fault Detection on Transmission Line Using Transient Monitor Index Parameters

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Abstract:

Transmission lines are incessantly disturbed with any kind of temporary or permanent faults, leads to effect of system stability and reliability. In order to avoid this issue, well operated distance relays are needed to be designed. Generally, Relay will provide accurate information for circuit breakers operation during occurrence of any kind of fault. Faults in transmission lines be detected first for immediate removal of fault to protect the system and then ensue to classify the type of fault by the relay. This paper introduces a new scheme for fault detection and classification on transmission line using Transient monitor index method. The proposed method calculates transient monitor index values from measured currents signals from one end information. These index values will discriminate the fault from normal event within a short duration and also classify the nature of the fault. The performance of the proposed method is studied on 500kV, 50Hz two terminal transmission system under MATLAB/SIMULINK environment. Different critical faults and non-fault events were simulated and the results show that the proposed method gives more accurate and faster response than other existing methods.

Keywords*: Three-phase current signals, Transient monitor index, critical events.*

1. Introduction

In power system, transmission lines are one whose probability of occurring faults is more due to its lengthy nature and expose to the atmospheric conditions. Transmission lines transfer bulk amount of power so we have to protect it from the fault events to achieve continuous reliable power supply to the consumers. Therefore, a proper fault detection schemes is adopted in the relay operation to provide

A New Design Hybrid Cascaded Multilevel Inverter for AC-DC-AC Conversion

P. Narasimman, R. Sathishkumar, N. Priya

Abstract: Single-Phase AC-DC-AC converters are employed in vast of applications such as UPS Systems, Motor Drives, Yaw Drives, Traction and Micro Grids. This paper introduces an incipient topology for multilevel inverter based Single-Phase AC-DC-AC converter for different types of loads. The suggested converter consists of two phases; a full bridge rectifier that converts AC supply to DC supply and a multilevel inverter that converts DC supply to AC supply cascaded into a rectifier. For the proposed system, the multilevel inverter is chosen as it raises the voltage output level and thus diminishes the Total Harmonic Distortion (THD). The converter suggested here effectively reduces the harmonics in the output voltage and using Multilevel Inverter, reduces THD in the AC-DC-AC converter. The simulation outcomes are acquired from MATLAB®Simulink platform and a hardware prototype of the inverter is done.

Keywords: Multilevel Inverter, AC-DC-AC converter, Filter Design, Total Harmonic Distortion.

I. INTRODUCTION

Conventional AC-DC-AC converters shown in Fig.1, which are broadly utilized for power utility and drive applications, are the indirect ac-ac converters. It is important to focus on flexible speed drive. The converter associated with the source is a voltage source rectifier and the load side converter is a voltage source PWM inverter. The DC bus is provided between the rectifier and inverter components of the drive. The ripple content in the output voltage of rectifier must be expelled before any power semiconductor switches are "on". If not, this distortion will appear in the output of the load. The inverter part is comprised of group of power transistor and diode combinations. These changes over the DC supply again to AC. For every half cycle, the inverter's power semiconductor switches are turned on and off several times, resulting in a pseudo-sinusoidal current waveform.

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Fig. 1 Conventional Single Phase AC-DC-AC Inverter

Normally the induction motor drive with performance improved AC-DC-AC converter must have the properties like: In the Voltage Source Inverter (VSI) side, primarily it is ought to have significant torque and flux operation and maximum output torque for given range of speed operation [1]. In the rectifier fed DC side there should be bidirectional power flow, increased Total Harmonic Distortion (THD) in input and reduction of link capacitor range [3].

This method of power conversion has impediments like, it uses an IGBT PWM inverter for DC-AC conversion, in which the ac line voltage is not pure sinusoidal, and hence there may be harmonics located at high frequencies causing more THD [6]. In case if these inverters are used for Adjustable Speed Drives (ASD), then the voltage ranges used are low, this happens due to factors like:

i. The presence of increased dv/dt in the pulse width modulated ac line voltage is not tolerable in the average to maximum voltage ranges.

ii. Sharing of load power by just four switches of the inverter

There are two strategies to approximate near-sinusoidal voltage by utilizing four-switch inverter.

➢ Current Source Inverter (CSI) connected to a capacitive filter.

➢ Voltage Source Inverter (VSI), which includes an inductive (L) or combination of inductive and capacitive (L &C), filters at the load terminals.

Despite the fact that above said topologies have an advantage of producing near sinusoidal voltage waveforms, but they have a disadvantage, that load power is shared only among four power switches for a single phase inverter [7]. Therefore, it is troublesome when this converter is connected to an adjustable speed drive, since it reduces the motor performance. Hence multilevel inverter topology is used in the proposed system to reduce the dv/dt and to share load power among different switches [4].

Quasi Z-Source Inverter for Pv Power Generation Systems

R.Sathishkumar, R.Velmurugan, Balakrishnan Pappan, J.Booma

Abstract: For the enormously increased power demand in the modern world, the existing fossil fuel sources seem to be inadequate to meet the demands. Hence, it is necessary to switch over to use Renewable Energy Sources (RES). Besides the demand concerns, the power generation from fossil fuels causes environmental pollution prominently. As a result, the utilization of RES has been encouraged. When RES is interconnected with the grid, this system becomes an excellent solution to fulfill the power demand of the present scenario. The energy generated from renewable energy sources varies according to seasonal variations. The power generated from RES can be delivered to the load by interconnecting it with the grid. When a small size RES system is connected with the distribution network, it can deliver energy to the isolated zones where the energy cannot be drawn from the conventional network. In this work, the Artificial Neural Network based Maximum Power Point Tracking scheme has been introduced with Photovoltaic (PV) power generation. Also, a bi-directional charger is introduced to overcome the battery issues. The model is evaluated in the MATLAB/SIMULINK package. The performance of the system is analyzed by applying different voltage levels to qZSI. The voltage gain, effectiveness of the scheme, MPPT and the regulation of the voltages are observed.

Keywords: qZSI, MPPT, converter, inverter, PV.

I. INTRODUCTION

The major non-conventional energy sources are PV, wind energy, and hydrogen powered fuel is scientifically acknowledged with the distributed generation. In general, the output of renewable is not regulated and it must be controlled by power converters. The power system reliability makes sure by the working of the converters. Regarding the converter circuit, the old cascaded topology of DC-DC converter and inverter makes the power circuit and controller circuit more complex. Furthermore, price and space needs are also high. The quantity of power electronic converters causes less effectiveness.

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The solar power generation is suitable and high capable after the arrival of thin-film PV technology, less price, outstanding efficiency, less weight, elasticity, and easy installation is achieved. In order to interconnect a PV based power source with the grid, we need to add a DC-DC switches which increases the cost of the system. Using those converter configurations would result in a larger stage of power conversion configuration. In order to reduce the configuration, a boosting inverter would be a suitable one. The power conversion and inversion should be done in a single stage to increase the voltage gain of the PV cell. In that case, a Z source inverter would be a suitable one, due to its boosting ability and its inversion ability on a single stage.

II. QZSI FOR PV SYSTEMS

A. PHOTOVOLTAIC SYSTEM

A PV array comprises cells that are joined as a series with shunt combinations. Series link of photovoltaic cells will help in raising the voltage of the unit while the shunt connections help in enhancing the current in the solar array. The PV cell output mainly depends on the variation in solar irradiation with temperature. The PV irradiation depends on the environmental condition of the location where it is being placed. Where there is an increase in solar irradiation, it also amplifies the open-circuit voltage. The temperature has an inverse relation to the production of power from the PV. As the temperature tends to increase, the open-circuit voltage will decrease. This is because a rise in temperature exchange the bandgap of the substance and high power is needed. Thus, the effectiveness of the solar cell is lowered.

MPPT scheme is applied for enhancing the peak power in the photovoltaic module. Many MPPT methods used to get the maximum ouput from RES sources. In this work comes under the perturb and observe method.

B. ANALYSIS OF QUAZI Z SOURCE INVERTER (qZSI)

The conventional z source inverter and quasi z source inverter are illustrated in Fig. 1 and 2. The shoot-through state is not allowed in the conventional as the short circuit will affect the system. The quasi Z source inverter and Z Source inverter is designed with the distinctive inductor, capacitor and diode are joined with the voltage source. This setup will guard the system against short circuit and other power quality problems. The qZSI increases the dc-link voltage and it pulls a steady-state dc from the supply.

Retrieval Number: B7813129219/2019©BEIESP
DOI: 10.35940/ijitee.B7813.129219

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1191

Performance Improvement of Sensorless Vector Controlled Induction Motor Drive for Medium Power Applications

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Abstract: This paper deals with sensorless vector controlled induction motor in which torque pulsations are reduced with improved input of induction motor. In proposed technique two multi winding transformers are used for generation of 18 sinusoidal signals given to rectifier unit and the rectifier output given as input to 9 level multi level inverter. In this proposed technique gating signals to the inverter switches will be provided through space vector pulse width modulation which considers speed as reference. This configuration was simulated in MATLAB/Simulink.and the simulation results are presented here with improvement in reduction of THD.

Keywords: Multi Winding Transformer, Multi-Level Inverter, Power Quality, Modulation Techniques, VCIMD.Space vector pulse width modulation

I. INTRODUCTION

Rated voltage of the induction motor drive for industrial applications are in the range of several kV, and the feasible of AC power is 33/11 kV. Driving IMD, there is definite use of a set of step-down transformer at the grid side, which power is fed to a six-pulse diode bridge rectifier (DBR). This DBR current has high THD percentage. In order to overcome the above problems, secondary winding of multi-winding transformer is to be connected to AC- DC converter preferably at the grid side. The transformer steps down AC power to the desired level and connected to 6-pulse diode bridge rectifier device (DBR). Several DBR connections are done in such a manner that harmonics produced by one DBR will be cancelled by harmonics produced in other DBR. All these connections of DBRs will produce final DC supply which in turn given as input to the cascaded H bridge multi level inverter [4]. Multi Level inverters are good choice in giving input supply to Induction Motor Drives. These inverters possess low THD and dv/dt. Variable frequencies can be obtained by using these inverters. Two separate types of polygonal configuration Δ- polygon 18 pulse AC-DC converter is used in the grid side. Since the phase shift in the input winding of the two 18 pulse converter is reconfigured as 36-pulse AC-DC converter, which makes nearly sinusoidal grid current, reducing its THD. Three level (1: 3) based on 9 CHB inverter is used to drive the motor, to

improve the performance of induction motor drive. As Sensorless vector control is used for the 3 phase induction motor (IM) and reference voltage signal is generated, which is used in accordance with an input modulation technology by using nine level CHB inverter. Here, the multi-pulse AC-DC converter is connected to CHB driving an induction motor drive for industrial applications. It has been pointed out that for applications of IMD, CHB operating frequency of the inverter is lower than 1kHz [8] to the limit. Thus, in this work, a new modification of the nearest level modulation techniques (NLMT) Presented at the fundamental frequency of operation of the inverter [9]. Since the basic operation of the inverter, the proposed IMD with very little switching loss is recommended for better efficiency results. Complete modeling, design, and operation of the suggested sensor less vector controlled induction motor drive response (SLVCIMD) mentioned in further sections. The switching frequency of CHB is less than 1kHz [8]. In this Paper, a new modification of the nearest level modulation techniques (NLMT) is Presented at the fundamental frequency of operation of the inverter [9]. By using CHB inverter in VCIMD the switching losses will be less with good efficiency than exiting VCIMD. The proposed system was simulated in matlab simulink platform to enhance the various load conditions and to analyze the output and to reduce the complexity of system. As the proposed system has components varying from existing configuration.The proposed system have the following blocks: i) 3 phase voltage source ii) two multi winding transformers, iii) ac to dc converter iv) 9 level multi level inverter v) speed estimator vi)space vector pulse width modulation and vii) Induction motor.

II. DESIGN OF PROPOSED SL-VCIMD

A 3 phase voltage is necessary to run a three phase induction motor drive but to control the induction motor drive we need so many components as shown in fig .1 we can get a glimpse of components .primarily the three phase voltage source is given to two multi winding transformer in those multi winding transformer secondary connections are in topology to generate three signal of each signal have phase difference of 20° like $+20^o$, 0° , $- 20^o$, from each of three phases so there are 9 signals at end for second transformer also there is a generation of 9 signals both are together made 18 signal and these 18 signals given to rectifier and the rectifier made 18 signal of both positive and negative into positive side so then there is a dc voltage of 36 pulses.

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Retrieval Number: B3325129219/2019©BEIESP
DOI: 10.35940/ijeat.B3325.129219

2061

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A Novel Seamless Reconnection and Islanding Technique for UPQC Connected Micro-Grid using Proportional Resonant Controller

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Abstract

This paper proposes a novel technique for the integration of Unified Power Quality Conditioner (UPQC) in Distributed Generation (DG)-based Micro-Grid (μG) system with Proportional Resonant (PR) controller has been presented here. The DG converters and UPQC Active shunt Power Filter (APF$_{sh}$) are placed at the Point of Common Coupling (PCC) and a dc link is also integrated with the storage system. The series part of the UPQC (APF$_{se}$) is connected before the PCC and in series with the grid. During the interconnected and islanded mode, DG converter with storage will supply the active power and the shunt part of the UPQC will supply the reactive and harmonic powers required by the load. DG converter will remain connected during the voltage disturbances. An intelligent islanding detection and reconnection technique (IR) is introduced in the UPQC and PR Controller is used as a secondary control. This arrangement is termed as UPQC$_{μG-IR}$. The simulation studies were conducted using MATLAB/Simulink software. The advantage of this proposed UPQC$_{μG-IR}$ over the normal UPQC in providing extra compensation during voltage interruption, voltage sag/swell, harmonic and reactive power compensation during interconnected mode are observed through simulation studies. Results obtained show the effectiveness of the proposed controller under both Islanding mode as well as in grid-connected mode.
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Keywords: Unified Power Quality Conditioner (UPQC), Micro-Grid, Distributed Generation (DG), Islanding, Proportional Resonant Controller

1. Introduction

The issues pertaining to the successful integration of unified power quality conditioner (UPQC) with PR controller in a distributed generation (DG)-based grid connected micro generation (μG) system are primarily: 1) complexity for active power transfer control 2) compensation of non-active power during the islanded mode and 3) difficulty in the capacity enhancement in a modular way [1]. For a seamless power transfer between the grid-connected operation and islanded mode, various operational changes are involved, such as switching between the current and voltage control mode, robustness against the islanding detection and reconnection delays, and so on [2], [3]. Clearly, these further increase the control

PV-Hess Based Zeta Converter for BLDC Motor Drive using Fuzzy Logic Controller

P. Roja Ramani, Sheik Mahaboob Shariff, M. N. V. Venkata Brahmam

Abstract: The growing importance of non conventional energy in the auto mobile industry needs the use of brushless DC (BLDC) motor drives the solar photo voltaic (PV). To overcome the disadvantages in the conservative DC-DC converters, Zeta converter is used to optimize power handling through controlling of duty cycle. To mitigate changes in output of PV, the Hybrid Energy Storage System (HESS) is implemented into the PV system to maintain a constant voltage at the BLDC motor input.
The PV-HESS system is controlled correctly by a robust power management algorithm. The Zeta converter can meet the smooth performance of the system by using particle swarm optimization technique of maximum power point tracking. By placing set of rules in the FLC controller we get the system stability faster than existed controller. The performance of the fuzzy logic controller built was demonstrated in terms of atmospheric condition changes using MATLAB/ Simulink.

Keywords: Fuzzy logic controller(FLC) Brushless DC (BLDC) motor, Photovoltaic (PV) system, Zeta converter, Particle swarm optimization (PSO).

I. INTRODUCTION

The increase in electricity demand in the 21st century has aroused scholars' curiosity about the efficient use of nonconventional energy. Solar is the available of existing non conventional energy sources because it is clean and environmentally free. Solar energy is the energy that is available from the sun in abundance. Solar power is the conversion of sunlight into electricity. As electricity plays a key role in our day today life we need it in abundance, as sunlight is clean, and is available for free solar power is created from it. Thus the heat collected by the receiver is used as electricity for performing various activities Because solar is recurrent, it is necessary towards tracking maximum power point stoic for greater efficiency of the solar system. To track the maximum power from solar PV systems so many MPPT techniques are given.Therefore, Maximum power point tracking (MPPT) is an important part of a photovoltaic (PV) systems, to provide that the power converter (MPP) at the maximum power point operation of the solar array. [1] has all kinds of MPPT algorithm has been developed perturb kinds of MPPT algorithm has been developed perturb observer (P & O). P & O in the process, the voltage is increased or decreased to achieve the MPP direction fixed steps. This continuous process is repeated regularly, up to MPP is reached.P and O methods are a widely used MPPT method .There are so many recent attempts to improve MPPT technologies [2] to minimize the drawbacks of conventional algorithms Due to shadows of clouds, trees, and buildings, uneven solar insulation of photovoltaic arrays is considered local shadow conditions (PSCs). PSC can cause multiple spikes in the PV feature. Traditional MPPT algorithms may bind to local peaks, whereas local peaks can not be correct MPP of the P-V feature. PSO-based MPPT algorithms[3] are unique of the enhanced and active MPPT technologies used to optimize maximum power extraction from solar PV systems and to track global MPP excitation with multiple peaks.

To provide continues supply Solar PV sources need backup, such as energy storage systems, hybrid energy storage systems are now the most popular system, This is a consolidation of batteries and super capacitors. A power backup in steady state is available via the battery, where acts as a backup for transient situations as a super capacitor. The HESS May Be Charged Or Discharged Via A Two-Way Dc-Dc Converter. Based on correct power management algorithm, a two-way DC-DC converter switching pulse may be created. Buck-Boost-type bidirectional converters have traditionally been used for this purpose.

Use a DC-DC converter to increase the voltage of the PV source. Several DC-DC converter topologies are available in the literature, where the Zeta converter captures. The researchers looked at improvements in a variety of applications, such as MPPT, Power Factor Correction (PFC), and Power Quality. The different advantages of using the zeta converter are that the infinite area of the MPPT enables dun, such as the presence of the monasterynal buck and boost converters[7], the presence of the inductor at the output end, which enables the output current to be continuous and For Zeta converters, no ripple-free c) negative voltage sensing element is not required because it produces a non-inverted output voltage. Employment of Zeta converter in brush less dc motor drive.It is good for soft start [8]and effective drive system. In the work, an effective and independent drive system is proposed, that is, the Use of PSO-based MPPT algorithm to develop switching pulses for Zeta converters, and dual-loop power management algorithm to control the overall PV HES system.

II. BLOCK DIAGRAM

The PV-HESS Power BLDC drive uses a MPPT algorithm, with the Zeta -converter engaged in Fig 1.
Solar PV systems are the primary basis for BLDC drives and energy storage system may be used as a backup to deal with intermittent conditions because of changes in environment circumstances. The change of the Zeta-converter is arranged by the triggering pulses developed by the controller.

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Power Quality Improvement using Modified Cuk-Converter with Artificial Neural Network Controller Fed Brushless Dc Motor Drive

Ch.Vijaya Sree, P.Krishna Chaitanya, B.Rajesh

Abstract: Power factor rectification converter (PFRC) hinged bridgeless modified CUK (MCUK) converter supplied to brushless DC engine drive utilizing an Artificial Neural Network controller. Presently, alteration for traditional CUK converter can be obtained through adding a voltage multiplier circuit, to decrease converter losses for wide variation of speed to accomplish most extreme Power Factor and to limit the Total Harmonic Distortion (THD). The designed bridgeless PFRC based converter was investigated hypothetically to obtain the circumstances, for example, Power factor (PF) and Total Harmonic Distortion (THD) are assessed and contrasted with traditional Diode Bridge Rectifier hinged CUK converter supplying to brushless DC motor drive and bridgeless altered CUK using PI controller driven brushless DC motor. Here, simulation results uncover that the ANN controllers are viable and productive contrasted with PI controller, as the steady state error when ANN control used is less and the stabilization of the system is better while using it. Additionally in ANN system, the time to perform calculation is less as there are no numerical models. The performance of the designed framework is simulated in MATLAB/Simulink environment.

Keywords: Artificial Neural Network (ANN), Brushless DC motor, modified CUK- converter (M-CUK), Power factor rectification Converter (PFRC).

I. INTRODUCTION

Today, the brushless DC motor become famous for having advantages such as great reliability, great efficiency, unusual torque to inertia ratio, low maintenance, and immense energy density, and so on. It was found applications in industry tools [1] huge space, air conditioners [2], the E.V's [3], Artificial Intelligence [4], space applications. The BRUSHLESS DC engine drive is by and large provided through Diode Bridge Rectifier alongside DC connect capacitor that brings about low power factor and also more THD [5] that doesn't fulfill the worldwide power quality measures such as IEC-61000 standards [6].Thus, the power factor correcting converters came, to produce very less THD and to improve power factor when used as front end converters for a brushless DC engine drives. Boost converter, driving the brushless DC motor placed utilizes direct torque control power factor correction

discussed in [8], which has a mind boggling regulation technique. Significant expense Digital Signal Processor's are utilized to actualize it, so it isn't reasonable for less cost operations. A functioning power factor correction which utilizes PWM switching was suggested in [9] this, possess a huge switching misfortunes. A step up-down converter sustained brushless DC engine drive for PFRC is designed [10] which experiences huge switching misfortunes and lessens the general framework effectiveness. Power factor correction converter utilizing SEPIC converter bolstered brushless DC engine drive explained in [11] which additionally experiences huge switching misfortunes. A functioning PFRC to drive brushless DC engine dependent CUK converter was designed in [12] that utilizes 3 sensors to regulate direct current voltage, which fits uniquely for immense power operations. Each and every topologies discussed above utilize a Diode bridge rectifier circuit as front end converter. This out comes in circuit multifaceted nature with diminished effectiveness. Consequently numerous bridgeless converters configuration designs are came for PFRC converters supplying brushless DC engine drive so as to keep away from circuit multifaceted nature with improved productivity. Bridgeless PFRC placed step up-down, CUK, Zero energy thermonuclear and Single Ended Primary inductor Converter designs for brushless DC engine drives came into existence [13-16]. These topologies experience the ill effects of low gain and huge current strains because of flows streaming collectively from input and yield currents. Moreover, traditional bridgeless Cuk converter brings about more noteworthy switch operation losses and the current strains prompts decline the rating and survival capacity of the converter. In this way, an adjusted Cuk network is essential to improve proficiency and to lessen switch losses. Here, a power factor correction based bridgeless alternating current – direct current altered CUK working in irregular operating condition is acquainted for Brushless DC engine drive to diminish present losses and to improve the productivity of the general framework. The benefits of this described brushless DC engine drive can be dissected with respect to the terminology such as power factor and total harmonic distortion over immense capacity of acceleration.

Revised Manuscript Received on December 08, 2019
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II. BRIDGELESS MODIFIED-CUK CONVERTER SUPPLIED TO BRUSHLESS DC MOTOR DRIVE SYSTEM

Robust Design of Multi-Machine Power System Stabilizers using Clonal Selection Algorithm

G. Naresh, M. Ramalinga Raju, M. Krishna

*Abstract***:** *Optimal design of multi-machine Power System Stabilizers (PSSs) using Artificial Immune-based optimization technique, Clonal Selection Algorithm (CSA), is presented in this paper. The proposed approach employs CSA to search for optimal parameter settings of a widely used conventional fixed-structure lead-lag PSS (CPSS). The parameters of PSS are tuned using the proposed clonal selection algorithm to simultaneously shift the undamped and lightly damped electromechanical modes of all plants to a prescribed zone in the s-plane. A multi-objective problem is formulated to optimize a composite set of objective functions comprising the damping factor and the damping ratio of lightly damped electromechanical modes. Incorporation of CSA as a derivative-free optimization technique in PSS design significantly reduces the computational burden. The main advantage of the proposed approach is its robustness to the initial parameter settings. In addition, the quality of the optimal solution does not rely on the initial guess. The performance of the proposed CSAPSSs under different loading conditions and system configurations is investigated on New England New York 16-machine 68-bus power system. The eigenvalue analysis and the nonlinear simulation results show the effectiveness of the proposed CSAPSSs over conventional power system stabilizer (CPSS) to damp out the local as well as the inter area modes of oscillations under different operating conditions.*

*Index Terms***:** *Clonal selection algorithm, Damping, Electromechanical oscillations, Power system stabilizer*

I. INTRODUCTION

The low-frequency oscillations in a disturbed power system grow to make the system separate and become unstable, if they are not sufficiently damped out. Modern power system utilities use, conventional power system stabilizers (PSS) as an auxiliary excitation control. PSS enhances system damping by providing supplementary stabilizing feedback signal in the excitation system [1, 2]. Larsen and Swann [3] have systematically explained the application of conventional lead–lag PSS in power systems. The conventional PSS (CPSS) is usually designed with a fixed gain, with an aim to stabilize at the nominal operating condition. However, the inherent non-linearity and multiple operating points of a power system degrade the performance of such a fixed gains CPSS. Adaptive and variable structure

Revised Version Manuscript Received on December 11, 2017.

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control schemes are also applied [4, 5] for the design of PSS. Looking at the complexity of these designs and also at the fact that these techniques does not assure robust power system stability with varying operating conditions, Kundur et al. [6] have proposed an approach for the design of PSS for a large generating stations, wherein enhancement of overall system stability was the main criterion for the selection of PSS and automatic voltage regulator (AVR) parameters. Using conventional methods, PSS can be designed sequentially taking one electromechanical mode into consideration at a time [7]. However, the limitation of such a design is that the stabilizer designed to damp out one mode may destabilize other modes of the system. In another scheme, a gradient-based optimization method is adopted [8]. Unfortunately, the problem of PSS design is a multi-modal problem and the gradient techniques might fail by getting trapped in one of the local optima.

Recently, global optimization technique like genetic algorithm (GA), and other heuristic techniques like tabu search and simulated annealing have attracted the attention in the field of PSS parameter optimization. Unlike other techniques, GA has the ability to arrive at the global solution point swiftly, as it can handle the search space from different directions simultaneously. Crossover and mutation operators between chromosomes, makes the GA far less sensitive of being trapped in local optima. However, when the system has a highly epistatic objective function (i.e. where parameters being optimized are highly correlated), and number of parameters to be optimized is large, then GA has been reported [9] to exhibit degraded efficiency.

To overcome the drawbacks of conventional and GA based PSS design, a new Artificial Immune-based optimization technique known as Clonal Selection Algorithm is used for the PSS design. In this paper, an eigenvalue based objective function reflecting the combination of damping factor and damping ratio, are optimized for different operating conditions of the power system. It is also seen that some simple adaptive feature incorporated in the main algorithm makes its convergence even faster. It was found that the proposed technique not only optimizes the parameters faster, but also with the optimized gains the CSAPSS shows better damping performance when the system is perturbed.
Results obtained from eigenvalues analysis and nonlinear time domain simulation is compared with results obtained by CPSS. In section (II) statement of the problem and structure of PSS are described. In section (III) Objective function used is presented. In section (IV) an overview of Clonal selection algorithm is presented.

An Integrated Coupled Inductor and Switched-Capacitor Based High Gain DC/DC Converter for Closed Loop Control of DC Motor

D.Madhu, D.Krishna Chaitanya, S.M.Shariff

Abstract -The voltage gain of Conventional boost converter is limited due to the high current ripple, high voltage stress across active switch and diode, and low efficiency associated with large duty ratio operation. High voltage gain is required in applications, such as the renewable energy power systems with low input voltage. A high step-up voltage gain active-network converter with switched capacitor technique is proposed in this project. The proposed converter can achieve high voltage gain without extremely high duty ratio. In addition, the voltage stress of the active switches and output diodes is low. Therefore, low voltage components can be adopted to reduce the conduction loss and cost. The operating principle and steady-state analysis are discussed in detail. Based on the concept of switched-inductor and switched- capacitor, this project proposes a novel switched-capacitor-based active-network converter (SC-ANC) for high step-up con- version, which has the following advantages: high voltage- conversion ratio, low voltage stress across switches and diodes, and self-voltage balancing across the output capacitors. The operating principle and steady-state analysis are discussed in detail. The simulation results are given to verify the analysis and advantages of the proposed converter

Index Terms— Coupled inductor, dc/dc converters, high step-up, switched capacitor, DC Motor

——————————— ◆ ———————————

1 INTRODUCTION

THIS DC-DC converter converts directly from dc to dc and is simply known as a DC converter. A dc converter can be considered as dc equivalent to an ac transformer with a continuously variable turn's ratio [1]. Like a transformer, it can be used to step down or step up a dc voltage source. Dc converters are widely used for traction motor control in electric automobiles, trolley cars, marine hoists and mine haulers [2]. They provide smooth acceleration control, high efficiency and fast dynamic response. Dc converters can be used in regenerative braking of dc motors to return energy back into the supply and this feature results in energy savings for transportation systems with frequent stops [3-5]. Dc converters are used in dc voltage regulators; and also used in conjunction with an inductor to generate a dc current source, especially for the current source inverter [6].

A boost converter is generally used and it has several advantages such as simple structure, continuous input current, and clamped switch voltage stress to the output voltage [7]. However, it is very difficult to satisfy both high voltage conversion ratio and high efficiency at once. This is primarily due to the parasitic resistances, which cause serious degradation in the step-up ratio and efficiency as the operating duty increases [8]. Moreover, in high output severe reverse recovery problem and it requires a snubber.

As a result, a general boost converter would not be acceptable for high step-up applications. To overcome this limitation, various types of step-up converters, utilizing the voltage conversion ability of a transformer, can be adopted [9].

In order to provide such a large step-up/step-down voltage gain, the non-isolation converters would have to

work with extreme duty ratios: in the case of boost-type converters, a large duty ratio would be necessary, but this is not possible due to the latch-up condition [10]. Moreover, the short conduction time of the rectifier switch determines a short pulse current with high amplitude flowing through it, and thus a severe rectifier-reverse-recovery problem.

Some transformer-based converters like forward, push–pull or flyback converters can achieve high step-up voltage gain by adjusting the turn ratio of the transformer [11]. However, the leakage inductor of the transformer will cause serious problems such as voltage spike on the main switch and high power dissipation [12]. In order to improve the conversion efficiency and obtain high step-up voltage gain, many converter structures have been presented. Switched capacitor and voltage lift techniques have been used widely to achieve high step-up voltage gain. However, in these structures, high charging currents will flow through the main switch and increase the conduction losses.

Coupled-inductor-based converters can also achieve high step-up voltage gain by adjusting the turn ratios. However, the energy stored in the leakage inductor causes a voltage spike on the main switch and deteriorates the conversion efficiency [13]. To overcome this problem,

coupled-inductor-based converters with an active-clamp circuit have been presented. Some high step-up converters with two-switch and single-switch are introduced in the recent published literatures. However, the conversion ratio is not large enough.

This paper presents a novel high step-up dc/dc converter for DC Motor. The suggested structure consists of a coupled inductor and two voltage multiplier cells in order to

Enhancement of Power Quality with Fuzzy Control of Dstatcom Supported Induction Generator

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*Abstract***:** *The DC-link voltage of VSC used as DSTATCOM is regulated by the SMC which suppresses undershoots and overshoots in the DC-link voltage. This paper presents an implementation of sliding mode controller (SMC) along with a Fuzzy controller for a DSTATCOM (Distribution Static Compensator) for improving current induced power quality issues and voltage regulation of three-phase self-excited induction generator (SEIG). DSTATCOM is a shunt-connected custom power device specially designed for power factor correction, current harmonics filtering and load balancing and used for voltage regulation at a distribution bus. Here we are using the fuzzy controller compared to other controllers i.e. the fuzzy controller is the most suitable for the human decision-making mechanism, providing the operation of an electronic system with decisions of experts. The use of SMC for regulating the DC link voltage of DSTATCOM offers various advantages such as reduction in number of sensors for estimating reference currents and the stable DC link voltage during transient conditions. The SMC algorithm is successfully implemented on a DSTATCOM employed with a three-phase SEIG feeding single phase or three phase loads. In addition, using the fuzzy controller for a nonlinear system allows for a reduction of uncertain effects in the system control and improves the efficiency.*

*Index Terms***:** *SMC, SEIG, DSTATCOM, DC-Link, PCC, VSC.*

I. INTRODUCTION

Such problem loads to co-exist on the same feeder as more sensitive loads. The use of an The DSTATCOM can also be applied to industrial facilities to compensate for voltage sag and flicker caused by non-linear dynamic loads, enabling induction machine for the power generation has increased in past two decades due to popularity of distributed renewable energy resources. The induction machine is economical for small power generation in the aspects of low maintenance, brush-less operation, ruggedness, free from field excitation etc. Apart from these advantages, the induction machine requires leading volt ampere reactive (VAR) at its terminals for building up of the voltage. The machine requires variable capacitance across terminals for maintaining the constant terminal voltage from no load to full load condition. The DSTATCOM protects the utility transmission or distribution system from voltage sags and/or flicker caused by rapidly varying reactive current demand. In utility applications, a DSTATCOM provides leading or

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lagging reactive power to achieve system stability during transient conditions.

The use of single-phase loads on three-phase induction generator causes the unbalance voltages and currents in the phases. All these problems can be solved by using custom power device such as Distribution Static Compensator (DSTATCOM) for the induction machine.

In this paper, the sliding mode control with fuzzy control algorithm is used for control of the dynamic operation of the DSTATCOM in distributed generation which improves the power quality at the terminals of the induction machine with reduced number of sensors. The main advantage of using sliding mode controller (SMC) is that the reference supply currents are estimated from the DC-link voltage of voltage source converter (VSC) which gives the robust control during transient conditions [10].

The operation has to be single point voltage operation; therefore, a fuzzy controller is used to attain the reference voltage without any steady-state error. The operation below the knee voltage reduces the magnetizing current drawn by the generator and hence increases its capability and reduces the harmonic distortion caused by the magnetizing current. Moreover, the power quality issues are also mitigated. The generator currents are always balanced and free from harmonics; therefore, the utilization of the generator is further increased and the operation is observed noiseless

II. CONFIGURATION OF DSTATCOM SUPPORTED INDUCTION GENERATOR

The schematic diagram of an induction generator supported by VSC-based DSTATCOM in the distributed generating system is shown in Fig1. DSTATCOM is connected in parallel with the load and an induction generator at the point of common coupling (PCC) for improving the power quality. Once the voltage is built and it is feeding the load, DSTATCOM starts its operation. It regulates the voltage by supplying the total reactive power required by the load and the extra reactive power required for maintaining the terminal voltage of an induction generator.

The control algorithm gives the reference currents and the current tracking is carried out by hysteresis controller which generates gate pulses for VSC of DSTATCOM. The DC-link voltage and its capacitor of DSTATCOM are selected depending on the PCC voltage and rating of the load which is to be compensated for improving the power quality. The DC-link voltage should sustain during the transient conditions and its value should be selected at least twice the peak value of the system phase voltage [9]. The DC-link voltage is estimated as

IMPLEMENTATION OF FUZZY BASED DUAL-BUCK HALF-BRIDGE VOLTAGE BALANCER IN DC MICRO-GRID

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Abstract: Micro-dc grid is a novel power system focused on the development of renewable resources. Two-wire transmitting power mode is generally accepted in a micro-dc grid, which is usually not suitable for the requirements of the input voltage levels of different power converters and loads. A half-bridge voltage balancer was introduced in a micro-dc grid, which can convert a two-wire mode into a three-wire mode in a micro-dc grid via a neutral line. However, the shoot-through problem existing in bridge-type converters degrades the reliability of the voltage balancer. In this paper, a dual-buck half-bridge voltage balancer and a control strategy like Fuzzy is proposed, which can avoid the shoot-through problem. The small-signal model of the voltage balancer is derived for designing the control parameters and the current relationships of the inductors; the capacitors and the unbalanced loads are analyzed particularly. Finally, a prototype, which can deal with 2-kW unbalance ability, is built to verify that the proposed voltage balancer may have a good ability of balancing the voltage by building a neutral line.

IndexTerms - **Buck converter, DC distribution system, Half bridge, Micro-dc grid, Voltage Balancer, MATLAB/Simulink.**

I. INTRODUCTION

A Micro-Dc grid based on distributed generation system, which can supply super high-quality electric power, is widely focused on in recent years with the development of renewable resource generations [1]–[8]. The use of the direct current allows simplifying the insertion between the distribution generation and the network. It needs only one interface converter with alternating current grid to make the operation in islanding mode easier, without compromising the safety of the public network [9], and it has a distinct benefit—a line loss reduction [10]. A micro-dc grid is also dependent on all types of interfacing converter, such as bidirectional converter and dc converter [11], [12], grid- connected inverter [13]–[15], voltage balancer [1]–[7], and so on. However, a micro-dc grid usually has only one voltage level in two-wire dc distribution system, and it is impossible to supply some types of loads at half voltage such as dc/ac inverters needing a neutral line, converters with input voltage balancing like half-bridge converter and three-level half-bridge converter, and so on. In particular, when a micro-dc grid is used in domestic and office places, a neutral line connected to ground is favorable to the security of the persons. Obviously, in practice, a micro-dc grid with two-wire power system is impossible to meet the requirements of all electronic devices. Thus, a half-bridge voltage balancer was specially introduced to build a neutral line [1]–[7], which can easily convert a two-wire dc grid into a three-wire dc grid by a neutral line. In practice, the voltage balancer may be dispersedly used in any place where the voltage balance is needed, and of course, it can be placed at the output side of the power supply center for building a whole three-wire dc grid. It is thus evident that the voltage balancer improves the quality and flexibility of power supply in a micro dc grid.

Unfortunately, the topology of bridge-type converters maybe suffers from shoot-through risk, which is a major drawback to the reliability of this type of power converters. A dual-buck half-bridge converter can avoid the shoot-through problem, the freewheeling current goes through the independent freewheeling diodes instead of the body diode of the switches, and all the switches and diodes are operated at half of the line cycle; thus the efficiency may be improved [16]–[21]. In this paper, a dual-buck half-bridge voltage balancer is proposed. For meeting the characteristic of the proposed voltage balancer, a control strategy of respectively driving the two bridge legs of the proposed voltage balancer to work for a high efficiency is also presented. In order to select the parameters of filter inductors and capacitors and to design the control system parameters, the relationships of the currents of inductors, the capacitors, and the unbalanced loads are described in detail, and the small-signal model is derived. Finally, a prototype, which may deal with 2-kW power unbalance ability, is fabricated in the laboratory to verify that the dual-buck half-bridge voltage balancer may have a good ability of balancing the voltage by building a neutral line.

II. TOPOLOGY AND CONTROL STRATEGY OF THE PROPOSED VOLTAGE BALANCER

A. Typical Structure of a Micro-DC Grid

A typical structure of a micro-dc grid [1]–[7] with a voltage balancer is shown in Fig. 1, where the voltage balancer is used to construct a neutral line achieving two same voltage levels for requirements of different types of loads, such as unbalanced loads, half-bridge converter and inverter, and so on.

PERFORMANCE ANALYSIS OF FUZZY BASED UNIFIED POWER QUALITY CONDITIONER FOR THREE PHASE FOUR WIRE DISTRIBUTION SYSTEM

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Abstract: **This paper introduced a new structure of 3P4W Distribution System (DS) using fuzzy based Unified Power Quality Conditioner (UPQC). The origin of 3P4W System is from 3P3WDS. In 3P4WDS the fourth wire is the neutral terminal of series transformer. The main aim is to control the unbalanced voltages   and currents on source side and load side in order to provide uniform power to nonlinear loads. Neutral currents flowing from the load towards the transformer neutral, Harmonics mitigation etc. In this paper 3P4WDS system is implemented by using two controllers i.e., Proportional Integral Controller (PIC) and Fuzzy Logic Controller (FLC) and the results are validated through Matlab/Simulink**.

Index Terms **-Unified Power Quality Conditioner (UPQC), Three phase four wire (3P4W), Three phase three wire (3P3W), Distribution System (DS), Proportional Integral Controller (PIC), Fuzzy Logic Controller (FLC), Power Quality (PQ), Matrix Laboratory (MATLAB), Total Harmonic Distortion (THD), Active Power Filter (APF), Voltage Source Inverter (VSI).**

1. INTRODUCTION

The drastic development of semi-conductor technology the usage of sensitive equipment's is increased at each level of the power system. Sensitive equipment's needs quality of power to function properly. Hence the power engineers have been challenged to provide quality of power. In this aspect there are many power quality improvement techniques [13] designed by the researchers. One of such schemes is the usage of 3P4W-UPQC.

3P4W-DS [1]can be implemented by different ways such as running a neutral wire from the generation station, Running neutral from the star connected transformer at the distribution side etc.,. In this paper a new technique is introduced in which the system is fed by 3P3W but with the help of UPQC a series transformer connected in star passion is served as 4th wire results to the 3P4W-DS.In general 3P4Wsystem[4,7,9] faces a major problem of unbalanced loading. In this paper a new technique is introduced to mitigate the problem in which the active power of each phase is calculated individually and then distributed again to all the three phases equally.

2. APPROACH TOWARDS 3P4WDS

With the drastic industrialization the demand of power increased to a large extent. Meeting the load is one of the task with the quality of power to the consumer points from the service providers. There are some limits for the consumer regarding the THD of the current because due to the THD the power system will be polluted as a result the other consumers will be affected. Hence the usage of UPQC plays a major role in every part of power system for the enhancement of the power quality.

3P4W system can be obtained in different ways one is by running a neutral conductor from the power producing station, a neutral from the transformer connected in the star passion. To protect the sensitive loads if a system is already connected with the UPQC by 3P3W system must be upgraded to a 3P4W system to have a provision for the installation of some single phase loads. Hence there is a need for up-gradation from 3P3W system to 3P4W system.

In this paper the up-gradation of 3P4W system is clearly shown even though the supply is 3P3W the utilities are having another option to realize the 3P4W system.

Up-graded 3P4W system must consist of a series transformer for connecting one of the inverters for the controlling of source voltage. The utilization of the neutral from the star connected series transformer results to the realization to the 3P4W system from 3P3W system.

Mitigation of Congestion in Deregulated Electrical Power Systems using Particle Swarm Optimization

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Abstract: With the enhanced demand for electricity, the structure, operation, management, and ownership of electrical power system has been changed due to technical, financial, and ideological reasons. Recent trend involves augmentation of power systems in terms of geographical area, assets additions, and penetration of new technologies in generation, transmission, and distribution sectors. The congestion occurs when the generation and consumption of electric power causes the transmission system to operate beyond transfer limits. Flexible alternative current transmission system (FACTS) devices can be used to reduce the flows in heavily loaded lines, resulting in low power loss and improved stability of the system. Thyristor-controlled series compensator (TCSC) is an emerging FACTS device designated to achieve this objective. The conventional methods in solving optimization problems in power systems suffer from several limitations due to necessities of derivative existence, providing suboptimal solutions, etc. In this paper, PSO based algorithm has been suggested for minimizing active power rescheduling cost and reactive power rescheduling cost of generators to alleviate congestion in IEEE 30-bus system. The sensitivity parameters are used in comparing the alternative locations available for generation capacity and percentage of congestion. The simulation studies proved the efficiency of the proposed approach to minimize congestion by optimal placement of TCSC to minimize the losses and to improve the power transfer in a power system network.

Index Terms - **Flexible A.C. Transmission System (FACTS), Thyristor Controlled Series Compensator (TCSC), Total Transfer Capability (TTC), Particle Swarm optimization (PSO), Congestion Management**

I. INTRODUCTION

Congestion is defined as the overloading of one or more transmission lines and/or transformers in the power system. In the deregulated electricity market, congestion occurs when the transmission system is unable to accommodate all of their desired transactions due to violation of MVA limits of transmission lines. In such a market, most of the time, the transmission lines operate near their stability limits, as all market players try to maximize their profits from various transactions by fully utilizing transmission systems. Congestion may also occur due to various factors, such as lack of coordination between and transmission companies (TRANSCOs), contingency like generator/line outage, sudden change in load demand, and failure of various equipment. Congestion may lead to a rise in cost of electricity, tripping of overloaded lines, and consequential tripping of other healthy lines. Congestion should be relieved to maintain power system stability and security; otherwise, it may result in system blackout with heavy loss of revenue. So, congestion management is given the highest priority, followed by cost recovery, etc., by the Federal Energy Regulatory Commission (FERC) [1] and many other utilities.

The present trend of congestion management is to use pricing tools, in the form of nodal and zonal pricing [2]. Despite these tools, congestion still exists and the level of congestion is increasing, alarmingly [3,4]. Due to economic, environmental and political reasons it is not preferable to build new transmission lines. Therefore, there exist an opportunity for technological means to remove or to reduce the transmission bottlenecks. So there is an interest in better utilization of existing capacities of power system by installing Flexible A.C. Transmission System (FACTS) device such as Thyristor Controlled Series Compensator [5]. FACTS are the power electronics based converter-inverter circuits which can enhance TTC, voltage stability, load ability, security etc. and can reduce losses, production cost of generation, can remove congestion and fulfill transaction requirement rapidly and efficiently. It is necessary to "optimally" locate FACTS devices in order to obtain their full benefits [6]. Various classical and artificial intelligence methods have been suggested to optimally locate FACTS devices with different kinds of objective functions. So, it is revealed that most of the OPF problems are non-linear and non-convex. With the inclusion of FACTS control variables, they become even more nonlinear because they change the size of bus admittance matrix and dimension of the problem. Conventional classical optimization methods like gradient method, lamda iteration, linear programming etc. rely on the convexity assumption of objective function. They fail to capture discontinuities of objective function and may get trapped into local minima or diverge at all. Choice of initial starting point also affects the quality of solution. Also, they could find only single optimized solution in a single simulation run. Thus, to find global optimum solution is a challenging task in optimization problem incorporating FACTS devices.

To solve such problem, an artificial intelligent method called Particle Swarm Optimization may be used as it is a fast method and it provides global or near global solution [7]. PSO has shown its superiority over other classical and AI methods with respect to execution time and global solution in solving economic dispatch problem [8], optimal reactive power dispatch problem [9]and congestion management [10] Transmission service pricing is also an important issue of deregulated market. Out of many suggested pricing methods, Locational Marginal Pricing (LMP) method is popular because it considers all system constraints and losses. As PSO cannot provide Lagrange multipliers which are required for finding LMP, an interior point method is used to calculate LMP. But choice of initial starting points greatly affects the quality of solution of interior point method.

Congestion management is the highest priority problem that the system operator has to solve in his routine activity. Several congestion management schemes suitable for different electricity market structure have been reported in literature survey.

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A Hybrid Clonal Selection Algorithm and Particle Swarm Optimization for Multiple Damping Controllers Design

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Abstract— Power System Stabilizers (PSSs) are used to generate supplementary control signals for the excitation system to damp electromechanical oscillations. This paper presents a new evolutionary learning approach based on a Hybrid of Clonal Selection Algorithm and Particle Swarm Optimization (HCSAPSO) for tuning the parameters of PSSs in a multi-machine power system. The stabilizers are tuned to simultaneously shift the undamped and lightly damped electromechanical modes of all plants to a prescribed zone in the *s*-plane. A multi-objective problem is formulated to optimize a composite set of objective functions comprising the damping factor and damping ratio of lightly damped electromechanical modes. The performance of the proposed PSSs under different disturbances, loading conditions, and system configurations is investigated on New England 10-machine, 39-bus system. The eigenvalue analysis and nonlinear time domain simulations demonstrate the effectiveness of the proposed HCSAPSO based damping controllers to dampout the local and the inter-area modes of oscillations.

Index Terms— Power System Stabilizer, Multi-objective Optimization, Clonal Selection Algorithm, Particle Swarm Optimization, Multi-machine Power System

I. INTRODUCTION

Damping of electromechanical oscillations in multi-machine power systems is the most important issue for its secure operation. These oscillations may sustain and grow to cause system separation if no adequate damping is available [1]. A well established classification separates the oscillations into two types: (i) local mode, which corresponds to oscillations of one or more generators in an area with respect to the rest of the system and (ii) inter-area mode, which is concerned with the oscillations of a group of generators in one area against a group in another area, usually connected by a long and/or weak tie line. The local mode frequency typically varies from 1.0 to 3.0 Hz [2], while inter-area mode frequency range will be between 0.2 and 1.0 Hz [3] in general cases. A common approach to damp these oscillations and improve system dynamic stability is to use conventional lead-lag Power System Stabilizers (CPSSs). These stabilizers are effective in damping local modes, and if carefully optimized may also be effective in damping inter-area modes up to a certain transmission loading [4]. Design of CPSS is based on the linear control theory which requires a nominal power system model formulated as linear, time invariant system [5]. CPSS based on this approach can be very well tuned to an operating condition and will provide excellent damping over a certain range around the design point. However, CPSS parameters may not be optimal for the whole set of possible operating conditions and configurations. Despite the potential of modern control techniques with different structures, power system utilities still prefer a CPSS structure [6, 7]. The reasons behind that might be the ease of online tuning and the lack of assurance of the stability related to some adaptive or variable structure techniques. Kundur et al. [8] presented a comprehensive analysis of the effects of the different CPSS parameters on the overall dynamic performance of the power system. It is shown that the appropriate selection of CPSS parameters results in satisfactory performance during system upsets.

Many different techniques have been reported in the literature pertaining to optimum location and coordinated design problems of CPSSs. Majority of these techniques are based on phase compensation and eigenvalue assignment [6–16]. Different techniques of sequential design of PSSs are presented [9-11] to damp out one of the electromechanical modes at a time. The effects of dynamic interaction among various modes of the machines are generally found to have significant influence on the stabilizer settings. Therefore, considering the application of stabilizer to one machine at a

2479

NEW MULTILEVEL INVERTER TOPOLOGY FOR PHOTOVOLTAIC SYSTEM

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ABSTRACT   This Paper proposes a single phase multilevel inverter configurations for renewable energy application especially photovoltaic system. The thirty one level configuration of multilevel inverter reduces the value of total harmonic distortion. The half bridge inverter utilized in the thirteen level configuration increases the output voltage level to nearly twice the output voltage level of a conventional cascaded bridge multilevel inverter. The higher output voltage level is generated with lesser number of power semiconductor switches compared to thirteen leve inverter configuration, thus reducing the total harmonic distortion and switching losses. The effectiveness of the proposed configuration is illustrated by replacing the isolated DC sources in multilevel inverter with individual p-hoto voltaic panels using separate perturb and observe based maximum power point tracking and boost converters. Th verification of the proposed system is demonstrated successfully using MATLAB/Simulink based simulation with constant irradiation and temperature conditions. Comparison is made between the thirteen level inverter configuration and thirty-one level inverter configuration. The thirteen level inverter configuration has a total harmonic distortion of 13.69%. The proposed thirty one level inverter configuration with less number of switches has a total harmonic distortion of 3.67%. Efficiency for thirteen level inverter is 95.80% and thirty one level inverter is 98.31%.

Keywords: Photovoltaic, Cascaded -bridge, multilevel inverter, boost converter, Maximum power point tracking, Integration of renewable source, Voltage source inverter.

Introduction

Power electronic converters, especially dc/ac pulse width modulation(PWM) inverters have been extending their range of use in industry because they provide reduced energy consumption, better system efficiency, improved quality of product, good maintenance, and so on. In recent days, to address the concern postured by conventional energy sources, for example, exhaustion of fossil powers and atmosphere changes, numerous countries are expecting to build their share of energy generation from clean energy. Solar, wind, hydro and bio-fuel energies are the prime applicants of clean energy. Solar energy and wind energy have become more prominent when compared to the other renewable energy resources In India, Ministry of New and Renewable Energy (MNRE) has implemented to scale up the renewable teatrtgo about 175 GW by 2022, with over 90% of this volume accounted by solar and win-dbased power [1]. The installation of solar energy capacity has grown rapidly by 20-25% over the last few years in India because of numerous advantages offered such as reduced cost, pollution free and continuous availability in day time. The reason for decrease in solar cost is based on factors such as increasing the efficiency of solar cells, improvement of manufacturing technology and economies of scale. Maximum power poitnrtacking (MPPT) plays a vital role in photovoltaic application for increasing the efficiency by tracking the maximum power from solar. Irradiation and temperatures are the two major factors which affect the generated voltage from photo voltaic (PV) system[2]. The usage of MPPT is to track the maximum power point during changes in the irradiation or temperature from the different approach for different problems therefore leading to high development times.

PWM TECHNIQUES

The fundamental methods of puls-ewidth modulation (PWM) are divided into the traditional voltage-source and current-regulated methods. Voltage source methods more easily lend themselves to digital signal processor (DSP) or programmable logic device (PLD) implementation [3]. However, currtencontrols typically depend on event scheduling and are therefore analog implementations which can only be reliably operated up to a certain power level [4]. In discrete curren-tregulated methods the harmonic performance is not as good as that of voltagesource methods. A sample PWM method is described below.

Performance Analysis of Isolated Zeta Converter FED Switched Reluctance Motor

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ABSTRACT Generally all the motors in the nature are inductive in nature. By operating on the AC supply, due to that inductance the input power factor will be affected. This paper presents an isolated zeta converter switched reluctance motor (SRM) drive with power factor correction for low power applications. A single phase AC supply is give to the diode bridge rectifier followed by an isolated Zeta converter then frontend converter with switched reluctance motor (SRM) drive. To design the PFC isolated Zeta converter operated in discontinuous conduction mode (DCM) for lo power applications. For better current regulation, the input voltage is boosted without using any voltage are current sensors, we get both current and voltage wave forms are in phase. For many variable speed drives applications, the presented topology makes it a better choice due to power factor correction.

Keywords: Discontinuous Conduction Mode (DCM), Front End Converter, Isolated ZETA Converter, Power Fact Correction, Switched Reluctance Motor (SRM) Drive

Introduction

A plenty of uni-polar excitation circuits are proposed in the literature for switched reluctance motor (SRM) drive. There are so many front end converters are available for the SR motor drive. There are (q+1) switches, q switches per phase, and 2q switches per phase are available for the SR motor drive as front end converter. Each and every converter has its own advantages and disadvantages. In that two control switches per phase topology offers the maximum control flexibility over the remaining topology presented. From the consumption side, required the operation of application, it will be necessary to improve the equipment to gratify the standards of harmonics. Which limits the current harmonics magnitude and it will be injected into supply.

Conventional AC/DC converters having a diode bridge rectifier with a bulk dc link capacitor do not satisfies with these standards. Due to the large size, weight and cost normal power factor correction circuits are impractical 50-60 Hz single phase lines. At the same time active PFC methods are more popular due to low cost switches. It consists of simple diode bridge rectifier followed by a dc-dc converter. By using this type of topology, we shaped the supply current to track the supply voltage, and also the advantage of this type of converter is complexity and extra charge of PFC stage was unnecessary for the maximum power factor for small power levels. By adding the additional PFC stage, the drive efficiency will be increased [4]. Similarly, the SR motor drive power factor improvement will be discussed. To make use of high feature rectifier for unity power factor was discussed. A new model c-dump converter was used to improve the power factor in [6]. A new buck boost converter topology with a front end converter to get high power factor [7]. A new converter topology, which consists of a two phase converter with dynamic supply current shaping for SR motor drive was discussed [8]. A sepic converter fed SR motor drive was discussed [9]. A power quality improvement of SR motor with zeta converter is discussed [10].

Proposed PFC Based Isolated Zeta Converter Fed SR Motor Drive

Figure 1 shows the proposed converter topology for the switched reluctance motor drive. A single phase AC supply is given to the diode bridge rectifier followed by a LC filter to reduce the switching ripples in supply system. That ripple less output will be given to the PFC based isolated Zeta converter followed by a DC link capacitor. The isolated zeta converter output will be given to the SR motor through front end converter. A uni-polar polar converter that is asymmetric bridge converter is used as the front end converter for SR motor. The voltage through the dc link capacitor is controlled by changing the duty ratio zeta converter. A single position sensor will be used to find rotor position of SR Motor and control the uni polar converter. The projected system is intended and simulated in MATLAB software and its performance is validated for improve the power factor of supply system for a different speed range.

A New Cascaded Multilevel Inverter Topology with Reduced Number of Switches and Sources Arranged in Matrix Structure

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ABSTRACT *This paper analysis an improved topology of a cascaded multilevel inverter (CMLI) that utilizes less switch count topological structure than that of conventional topology. So with the reduced number of switches, the topological structure is designed by the mould of a matrix for a CMLI. As the numbers of switches are depleted in the conduction path, so both the switching as well as conduction losses are reduced, lower input current distortion and electromagnetic interference are also reduced. Therefore it assists for the higher efficiency of the converter. The propound inverter focus extends the outstretch to produces different number of output voltage levels from the congruent topology, there where it uses the same number of the voltage source and very less number of switches when compared to the conventional inverters. Thus the desired operation of the power modules and firing pulses are generated by the annex pulse width modulation (PWM) techniques strategy. And its changes in the harmonic spectrum will be analyzed. The converter will be modeled with the assist of MATLAB/SIMULINK.*

Keywords: Matrix structure, CMLI, Level Shifted Carrier PWM, Reduced switch count topology.

Introduction

The work of multilevel inverters (MLIs) during the crisp years have paid a great acknowledgment to a snazzy kind of power converter. The approach to the MLI is done by a consistent switching, thus which can provide a stepped output voltage waveform with low harmonic distortion. The mode of multi voltage source inverter in the medium power voltage application provides of a charge effectiveness amalgamation in the management market [4].

In this converters we can regard capacitors, batteries and renewable energy voltage sources as the multiple DC voltage sources, so these converters can be widely used in power generations, water plants, power quality devices, marine propulsion, liquefied natural gas and energy transmissions .The several DC sources as a input synthesizes a desired output voltage by using MLI as a power interface. This multiple DC sources are aggregate by the commutation of power switches in verdict to achieve steep voltage at the output.

When contrast to the conventional two level inverters there are diverse advantages for MLI, so these are commonly used for high voltage and high power applications which leads to the reduction in T.H.D [2]. MLI are having the ability to perform power conversion by exploiting the multiple small voltage levels. The content of harmonic at the output voltage is depleted, similarly the filter becomes smaller and cheaper making the system compact when compared to the two level inverters. Moreover these are having lower switching losses, good electromagnetic compatibility, improved power quality, lower electromagnetic interferences than the two level inverters.

There exists the three commercial conventional multilevel voltage source inverters includes [4]: a)diode clamped multilevel converter (DCMLC), b)flying capacitor multilevel converter (FCMLC), and c)cascaded multilevel converter (CMLC) [1-3]. Among these topologies, CMLI having the higher output voltage, less voltage stress, power, and reliability due to modular topology. One aspect which provide the difference between the CMLI and other MLI is, CMLI utilizing the different DC source voltages for the each H-bridges which consequential in dividing the power conversions between H-bridges and output of each bridge are connected in series to obtain stepwise output voltage. CMLI are the most popularly enact topologies in the evolve technological field of the renewable energy [5].

 Unfortunately the evaluation tales out that the MLI are having various disadvantages. One of the most conspicuous disadvantages is it utilizes the abundant number of power semiconductor switches are required. The size of overall circuit and the complexity increases because a protection circuit and a gate driver is required for every switch requires. Thus which leads to the general system to be more costly and difficult? Therefore in the practical realization it elucidate sketch a path for declining the utilization of power switches and gate driver in each cycle of operation to accrue the deliberate level of output load

Grid Connected Dual Voltage Source Inverter With Power Quality Improvement Features Using Fuzzy Logic Controller

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ABSTRACT *This paper presents fuzzy logic controlled dual voltage source inverter (DVSI) scheme to enhance the power quality and reliability of the microgrid system. The proposed model consists of two inverters, which empowers the micro grid to trade control produced by the distributed energy resources (DERs) and furthermore to remunerate the nearby unbalanced and non linear load. The control calculations are produced in light of instantaneous symmetrical component theory (ISCT) to work DVSI in grid sharing and grid infusing modes. The proposed conspire has expanded reliability, bring down bandwidth necessity of the fundamental inverter, bring down cost because of deducing in filter size, and better usage of microgrid power while utilizing decreased DC-interface voltage rating for the principle inverter. These highlights make the dual voltage source inverter (DVSI) plot a promising alternative for microgrid supplying sensitive loads. The topology and control calculation are validated through extensive simulation results.*

Keywords: instantaneous symmetrical component theory (ISCT), microgrid, power quality

INTRODUCTION

In the present scenario the technological advancements and environmental concerns lead the power system to a typical shift with more renewable energy sources integrated to the network by means of distributed generations(DG). These DG units with consequent control of local generation and storage facilities from a micro grid. In a micro grid, power from variable renewable energy sources such as fuel cells, photovoltaic(PV) systems, and wind energy systems are connected to grid and loads with power electronic converters. A grid interactive inverter plays an dominant role in interchanging power electronic converters. A grid connected inverter plays an main role in exchanging power from the micro grid to the grid and the connected load . This micro grid inverter can either work in a grid sharing mode while delivering a part of local load or in grid injecting mode, by injecting power to the main grid. Power quality maintenance is another major aspect that has to be concerned while main grid is connected by micro grid system. The growth of power electronic devices and electrical loads with unbalanced nonlinear currents has degraded the power quality in the power distribution network. Furthermore , if there is a significant amount of feeder impedance in the distribution network, the propagation of these harmonic currents distorts the voltage at the point of common coupling(PCC). At the same point, automation in industries has reached to a top level of sophistication, on the other hand plants like automobile manufacturing, chemical factories, and semiconductor manufacturing units require clean power. For serving these utilities, it is necessary to compensate nonlinear and unbalanced load currents.

Load compensation and power injection is done by grid interactive inverters in micro grid have been given in the literature . A single inverter system with power quality enrichment is discussed in . The key focus of this work is to understand dual functionalities in an inverter that would provide the amative power injection from a solar PV system and also works as an active power filter, compensating unbalances and the reactive power required by other loads connected to the system.

In , a voltage regulation and power flow control scheme for a wind energy system(WES) is proposed. A distribution static compensator (D STSTCOM) is not only utilized for voltage regulation but also for active power injection. This control scheme controls the power balance at the grid terminal through the wind fluctuations with sliding mode control. A multifunctional power electronic converter for the DG power system is explained in. this scheme has the capability to inject power generated by WES and also to work as a harmonic compensator. Most of the literature considered here in this area discuss the topologies and control algorithms to supply load compensation capability in the same inverter in addition to their active power injection. When a grid-connected inverter is used for both active power injection as well as for load compensation, the inverter capacity that can be utilized for achieving the preceding aim is decided by the existing instantaneous micro grid real power. Taking into account the case of a grid-connected PV inverter, the existing capacity of the inverter to supply the reactive power becomes less during the maximum solar

FOGI-FLL Algorithm Based Fuzzy Logic Control Used with Recursive Digital Filter for Power quality improvement of a Grid Tied Solar PV System

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Abstract-This paper proposes a control strategy for transferring active power between solar photovoltaic (PV) and grid / loading arrays, with improved power quality by removing harmonics and providing reactive power compensation required by the load on the distribution network. The proposed method to improve the performance of the fourth-based fuzzy logic system based on general integrator (FOGI) frequency-based control (FLL) for optimal operation of the solar energy conversion system (SECS) includes a static compensator (dstatcom) distribution capability in addition to supplying active power to the distribution network. Fogi-FLL is more capable of ordering than traditional algorithms. The frequency tracking capability of the suggested control approach outperforms previous algorithms. The recursive digital filter control is used to improve the PQ index of the Interfaced Grid PV system by ensuring power flows between network utilities and linked loads all of the time. To process load currents and extract the active power components, recursive digital filters are used. The prototype system was built in the lab and its performance was investigated for varied charges, altering solar insulation, swelling voltage, voltage and voltage distortion situations.

*Index Terms— **Power Quality, Distribution Static Compensator (DSTATCOM), Solar PV Generation, Recursive Digital Filter.***

I. INTRODUCTION

The use of fuels was a major focus of the Paris Climate Agreement in 2015, which emphasised a reduction in the use of fossil fuel-based energy sources. Inexperienced power is obtained economically from solar, wind, biomass, geothermic, and hydro energy sources since electricity obtained from renewable energy sources [1] has no effect on carbon gas emissions. Their demand will be attributed to the need to reduce carbon dioxide emissions and, as a result, oil consumption. Because of the rising amounts of pollution produced by traditional energy sources, the use of renewable energy is being highlighted. Solar power, wind energy, periodic event energy, and bio-mass energy are among the renewable energy sources being used. Distributed generation (DGs) is based on the use of renewable energy sources, which do not produce pollution, are a clean kind of energy, and may be found in plenty in nature [2]. The demand for the extraction of stellar energy is growing, accompanied by an increase in government subsidies. Solar energy is becoming more popular because it is abundant and hence solar power plants do not require any moving parts. The solar photovoltaic distributed generation (PV-DG) system is one of the fastest growing distributed energy sources, owing to the large amount of solar energy available and thus the ease of installation. The reason for using PV power in the distribution network rather than the transmission grid is mostly based on regulatory and economic considerations. Because of the intermittent convenience of star PV power induced by severe weather conditions, the PV-DG system has a significant impact on power quality (PQ) [3] and system functioning. PV arrays are the first component of a solar PV system, and their nonlinear relationship between solar PV current and voltage causes problems with power utilisation. Maximum power point trailing approaches are used to force the solar PV system to control at maximum power point (MPP) regardless of external variables (MPPT). As MPPT is a crucial component of a PV system, extensive research has been conducted in the literature.

The perturb and observe (P&O) technique is used because of its simplicity and ease of implementation. Weather-induced fluctuations in generation, voltage unbalances, and protective devices are all concerns that arise as a result of the broad deployment of alternative energy sources [4-5]. The first reason for the increased use of grid-

Optimal Fuel Consumption using FUZZY based RSC Control Strategy on Wind Driven DFIG, DG and Solar PV Array

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Abstract—This article focuses on to provide a new method that dynamically optimises the controllers of a doubly fed induction generator (DFIG) operated by a wind turbine (WT) to improve DFIG transient performance in all wind speeds. In small signal stability analysis, FUZZY is presented to optimise parameters of PI controllers on the rotor side (RSC) of the DFIG at various wind speeds in order to maximise the damping ratios of the system eigenvalues. An fuzzy logic controller (FLC) is created, taught, and capable of swiftly forecasting the ideal values of parameters based on the optimal values and the wind speed data set. Adaptive PI controllers (including FLC) are designed to modify PI gain values dynamically in response to changing wind speeds. A microgrid based DFIG and DG, including a PV battery system, was simulated using MATLAB software. The findings reveal that the DFIG of FLC-based adaptive PI control can greatly improve transient performance over a wide range of wind speeds.

Index Terms—**Wind Turbine, doubly fed induction generator (DFIG), diesel generator, solar photovoltaic array, bidirectional buck/boost DC-DC converter, battery energy storage, power quality.**

For the following reasons [1]-[3], diesel generators (DGs) are highly valued for decentralised power generation as well as backup power inside the urban dwelling society.

- DGs can be transported and dispatched, and they have a reduced initial investment cost.
- DGs are easy to maintain.
- They require a higher conversion efficiency than alternative energy sources, resulting in lower specific greenhouse gas emissions.

They are widely utilised for the facility distribution of islands, commercial and military ships, and other purposes [4]. DGs, on the other hand, suffer from a greater running value in terms of noise and pollution. The cost of operation is determined by the amount of fuel consumed to power the plant. This cost can be decreased by using renewable energy (RE) sources such as wind, solar, and biomass, among others. Furthermore, renewable energy sources are pollution-free and abundant in nature. Because of their lower costs and technological developments, wind and solar are considered to be more popular among RE sources [5], [6]. Wind turbines are primarily divided into two types: fixed speed and variable speed. Due to their ease of operation, fixed-speed wind turbines were previously used. They do, however, experience increased power loss. Because of advantages such as lower device rating, less acoustic noise, exceptionally energy efficient, and low power loss, variable speed wind turbines with doubly fed induction generators (DFIG) are the most commonly utilised for wind energy extraction [7]. There is a lot of literature on DFIG-based wind energy conversion systems (WECS) in both freestanding [8] and grid connected modes [9]-[11]. The authors have given DFIG-based WECS working in standalone mode with electric battery energy storage (BES) directly connected at the DC connection in [8]. Furthermore, the performance with and without BES is compared. In [9], the authors provide an associate degree extended active power theory for turbine coupled DFIG functioning in both balanced and unbalanced grid settings. Furthermore, the DFIG is managed by a single rotor facet device (RSC). As a result, the topology suffers from facility quality issues, especially during harmonic loads. Liu and colleagues. [10] looked at the effect of section barred loop parameters and grid strength on the soundness of a grid-connected DFIG wind energy system. An experimental validation, on the other hand, has not been carried out. The authors of [11] suggested a synchronisation control mechanism for DFIG's smooth grid association. Furthermore, it's been implemented using a modified IEEE 29 bus system that makes use of a real-time simulation platform. Hardware realisation, on the other hand, has yet to

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Proof-of-Minimum Privacy Leak Consensus Strategy in Blockchain

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🔒 PDF

How to Cite

Yogi MK, Mundru Y, Prasad Pennada SS. Proof-of-Minimum Privacy Leak Consensus Strategy in Blockchain. ECFT [Internet]. 2022 Apr. 30 [cited 2023 Aug. 28];9(1):24-35. Available from: https://stmcomputers.stmjournals.com/index.php/ECFT/article/view/239

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Abstract

In this study, we propose a novel consensus algorithm to preserve the security and privacy of a transaction. We propose a Proof-of-Minimum Privacy Leak consensus strategy. This means that the competing nodes which participate in the competition to mine the next block should give a proof of minimum privacy leak during its transaction. Only this proof will give highest votes to that node, and it will be elected as the leader. The minimum privacy leak of a node participating in a Blockchain depends on various factors intrinsic to the Blockchain application. For example, if the application is related to healthcare, it will be related to the sensitive data of a patient, if it is a banking application, it will be related to monetary aspects of the account holder, etc. For our study, we apply the proposed approach to a smart voting system where Blockchain is deployed. Here, the participants' details during voting are private data and there are provisions to reduce the voter privacy so that the participants of the smart voting

Issue

Vol. 9 No. 1 (2022): E-Commerce for Future & Trends

Section

Articles

Review   CTIT

Study of Uncertainty Quantifications for Designing Smart Systems

Manas Kumar Yogi[1,*], Dwarampudi Aiswarya[1]

Abstract

Uncertainty is an innate piece of this present reality. No two actual examinations at any point produce the very same result values and numerous significant sources of info might be obscure or immense. Uncertainty impacts practically all parts of designing displaying and plan. Engineers have long managed estimation mistakes, unsure material properties, and obscure plan request profiles by including elements of wellbeing and widely testing plans. By more profoundly getting it and measuring the wellsprings of uncertainty, we can spread the word about better choices with levels of certainty. Our article is a sincere study toward measures, which can indicate a mathematical representation of uncertainty during calibration of smart systems as in smart systems due to the dynamic nature risks associated with uncertainty can diverge into different directions. Spread of uncertainty allows clients to foresee the likelihood disseminations of framework yields coming about because of appropriations of questionable or variable framework inputs. Practically, all frameworks have some info uncertainty ordinarily from inputs like actual estimations, produced aspects, material properties, natural condition, and applied powers. Engendering of uncertainty assists engineers with deciding if the framework results will meet necessities, what the outrageous probabilities truly are, and which information sources significantly affect the result conveyances. This implies better introductory plans, quicker improvement, and worked on investigating. The article discuss various aspects of uncertainty metrics, which act as quantifiers which can help in the merger of divergent design principles which in turn acts as an significant catalyst such that inherent merits of design methodology are embedded into a smart system during initial system design.

Keywords: Smart systems, dynamic, uncertainty evaluation, information, numerical model

INTRODUCTION

Uncertainty evaluation (UE) is a component of quantitative portrayal and diminishing the level of vulnerabilities in both computational and genuine applications. It attempts to find the likelihood of certain outcomes in case some facets of the system are not exactly known. Many issues in engineering domains are also rampant with sources of uncertainty. With this article, we intend to study the various uncertainty quantification problems, which the designers encounter while designing cyber physical systems. The origins of uncertainty in SMART SYSTEMS can be categorised into 3 broad areas [1]. They are statistical (aleatoric), lack of knowledge (epistemic) uncertainty, or systematic uncertainty. In Brilliant Frameworks, statistical uncertainty is principally because of haphazardness of exactness of detecting and activation, often because of uncertainty of assembling processes. Systematic uncertainty is emerges due to incomplete knowledge either due to constraints of domain knowledge or due to boundaries in modelling. Typical demonstrations of epistemic uncertainty are confined efficacy of models of

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1

Journal of Computer Technology & Applications

Home > Vol 12, No 2 (2021) > **Yogi**

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Balancing Data Utility and Data Privacy using Synthetic Data for Cyber Physical Systems

Manas Kumar Yogi

Abstract

Cyber-physical systems are becoming famous and indispensable part of smart environment. As we say so, the need for preserving the trust of users is also multiplying with time. The CPS should be designed in such a way that the private and sensitive data of users in a CPS ecosystem needs to be protected without effecting the utility of data. This issue leads to a trade-off between the two aspects which can be balanced by the introduction of conceptual framework of synthetic data and its properties. The essential features of synthetic data are projected in a concise manner in this study which will help the engineers working in this research domain to a certain degree of usefulness.

Keywords

Anonymization, cyber physical systems, synthetic, utility, privacy

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Risk mitigation measures during adoption of ML techniques for additive manufacturing quality control and data security

Pennada Siva Satya Prasad and Manas Kumar Yogi

Abstract
Additive manufacturing (AM) has arisen as a promising advanced manufacturing innovation. Notwithstanding, its expansive selection in industry is as yet impeded by high passage boundaries of design for additive manufacturing (DfAM), restricted materials library, different preparing deserts, and conflicting product quality. Lately, machine learning (ML) has acquired expanding consideration in AM because of its unprecedented performance in information undertakings like order, relapse and grouping. This article gives a comprehensive audit on the cutting edge of ML applications in an assortment of AM spaces. In the DfAM, ML can be utilized to yield new elite Meta materials and advanced topological designs. In AM preparing, contemporary ML calculations can assist with upgrading measure parameters, and lead examination of powder spreading and in-measure deformity observing. On the production of AM, ML can help professionals in pre-manufacturing planning, and product quality assessment and control. In addition, there has been an expanding worry about information security in AM as information penetrates could happen with the guide of ML procedures. This paper puts forth the challenges arising when machine learning techniques are used during quality control and data security in the field of additive manufacturing. Then we propose few risk mitigation strategies to counter those challenges. This paper can be a readymade guide for practitioners who are involved in AM process considering ML solutions in the process.

Keywords: Additive manufacturing, machine learning, quality, security, risk

Introduction
Additive manufacturing permits industries to grow minimal expense customized and on-demand products or complex pieces of a machine in a brief timeframe, which brings about low energy utilization and less waste materials. In additive manufacturing, cost prediction of a product (i.e., machine or a piece of a machine) is a significant factor that straightforwardly affects the production and is a testing measure [1]. In smart industries, because of ML and Big Data methods, the expense of various products can be precisely predicted. Be that as it may, precise predictions require an adequate amount of manufacturing information/information, which could be gotten from the crude data created during the manufacturing and inventory network process [2, 3]. The manufacturing and store network process. In writing, a few intriguing arrangements have been proposed for breaking down various parts of additive manufacturing. The utilization of advanced data model string for additive manufacturing is presented with the answers for data the board to meet the necessities of present day industries. Like any manufacturing technology, additive manufacturing needs certain framework conditions to achieve the best cost-benefit ratio [4]. For instance, introducing the expensive tool prices of injection molding can compensate the production costs, industrial 3D printing drives some profits in multiple domains like: Construction of basic components with efficient cost, decrease the costs related to production and storage of spare entities by

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Impact analysis of using ML techniques on imbalanced datasets for leveraging security of industrial IoT

Manas Kumar Yogi and KVV Subba Rao

Abstract
Machine learning calculations have been demonstrated to be reasonable for getting stages for IT frameworks. Nonetheless, because of the basic contrasts between the industrial internet of things (IIoT) and normal IT organizations, a unique exhibition survey should be thought of. The weaknesses and security prerequisites of IIoT frameworks request various contemplations. In this paper, we study the reasons why machine learning should be coordinated into the security components of the IIoT, and where it right now misses the mark in having an agreeable exhibition. The difficulties and certifiable contemplations related with this matter are concentrated in our exploratory plan. In this paper, we advocate a novel mechanism to evaluate the various ML techniques, with the help of an IIoT testbed.

Keywords: IIoT, imbalanced, sensor, security, attack

1. Introduction
Utilizing the internet of things (IoT) innovation in the industrial control systems (ICSs), known as the industrial internet of things (IIoT), has gotten extremely famous lately. ICSs are the fundamental piece of each basic framework and have been used for quite a while to oversee industrial machines and cycles. Supervisory Control and Data Acquisition (SCADA) systems often deal with the ICSs and are considered as the biggest subset of these systems. Principle parts of these systems are to perform continuous observing and connecting with the gadgets, constant assembling and dissecting the data, and logging every one of the occasions that occur in the framework. Using IoT innovation in these systems improves the organization knowledge and security in advancement and computerization of industrial cycles. IIoTs are for the most part strategic applications with high-accessibility necessities. Their activities lead to an enormous measure of data that can be effectively overseen through huge data investigation techniques. Previously, to get ICSs from malignant external assault, these systems used to be secluded from the rest of the world. Nonetheless, ongoing advances, expanded availability with corporate organizations, and usage of internet interchanges to send the data all the more helpfully have presented the chance of digital assaults against these systems. Because of the touchy idea of the industrial application, security is the principal concern. Since intrusion is the essential security worry in IIoT, an intrusion detection system (IDS) is a basic piece of these applications to give a protected climate. Stuxnet worm, which was uncovered in 2010 and as of late returned (late December 2017), and Triton malware against the ICSs raised familiarity with the need for extraordinary thoughtfulness regarding the security of such significant system. Through the major contrasts between the ICSs and the normal IT systems, their basic weaknesses and needs are distinctive. Besides, ICSs have a specific kind of traffic and data utilizing particular IIoT communication conventions. Because of every one of these reasons, appropriate determination should be viewed as with regards to planning an IDS for ICSs.

Machine learning-based security arrangements have been generally utilized in giving security to IT systems. In any case, the reasonableness of these methods for IIoT applications is questionable. The principle security worry in IIoT devices is to detect any entrance into the system. Intrusion detection accompanies uncommon highlights, for example, significant imbalanced datasets that occasionally the prepared machine learning (ML) calculations will

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FUSION OF AI WITH IOT (AI2OT): PARADIGM, CURRENT TRENDS, FUTURE DIRECTIONS

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ABSTRACT

The IoT (Internet of Things) and AI (Artificial Intelligence) are powerful technologies. When we combine AI and IoT, you get AIoT--the artificial intelligence of things. We can think of IoT devices as the digital nervous system while AI is the brain of a system. To understand AIoT, we must start with the internet of things. The Internet of Things (IoT) is created when "things" such as wearable devices, refrigerators, digital assistants, sensors, and other equipment are connected to the internet, are frequently recognised by other devices, and collect and process data. Artificial intelligence refers to a system's ability to execute a set of tasks or learn from data in an intelligent manner. As a result, when AI is introduced to the web of things, those devices will be able to analyse data, make judgments, and act on that data without the intervention of people. These are "smart" devices, which aid in increasing efficiency and effectiveness. AIoT intelligence provides data analytics, which is then utilised to optimise a system and generate improved performance and business insights, as well as create data that helps the system learn and make better decisions.

Keywords: AI, Analytics, IoT, Smart, Sensors.

I.   INTRODUCTION

Today's business world is changing with the adoption of IoT (Internet of Things). IoT helps in prominently capturing an incredible amount of knowledge from multiple sources. Realizing the long run and full potential of IoT devices would require an investment in new technologies. The convergence of AI and IoT can redefine the way industries, business, and economies functions. AI enabled IoT creates intelligent machines that simulate smart behaviour and supports in deciding with little or no human interference. Combining these two streams benefits the commoner and specialists alike. While IoT deals with devices interacting using the web, AI makes the devices learn from their data and knowledge. This blog highlights why we would like IoT and AI to figure together.

AI in IoT crunches continuous streams of data and discovers patterns that are undetectable by simple gauges. Combining AI and IoT allows firms to understand and predict a wide range of dangers, as well as automate responses. Mobile devices, high-end computers, and low-cost sensors are all examples of Internet of Things devices. The most prevalent IoT ecosystem, on the other hand, includes low-end sensors, which provide floods of data.

Essentially, the mixture of AI and IoT is one among the many keys to accelerate technological development also as enabling disruptive services within the digital domain.

Using AI technology in cloud computing services, the complete digital information collected by various machines, devices, and sensors of the IoT may be efficiently and even organised. AIoT will undoubtedly
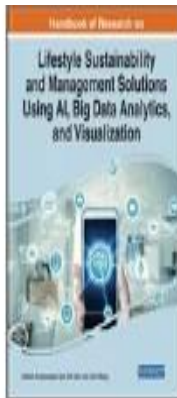
Beyond the Pandemic: Survival of the Human Race and Challenges

Manas Kumar Yogi, Jyotsna Garikipati

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Abstract

The COVID-19 pandemic is changing our lives in an unanticipated manner. Various sectors like healthcare, education, business, entertainment, tourism, etc. are affected. Many disruptive technologies like AI, blockchain, 3D printing, robotics, genomics, distributed power systems, etc. made a huge impact during the pandemic. Wearing masks, frequent handwashing, maintaining social distance, etc. are the new normal. The Sustainable Development Goals (SDG) that were targeted for 2030 are moving against the goals. Due to COVID, online shopping increased, reported crime rates reduced, cybercrimes increased, school dropouts increased, financial instability increased, etc. Many researchers are affirming that only after attaining herd immunity, the corona virus will vanish. But another question to be answered is whether it is possible to achieve herd immunity with so many variants of the virus spreading all over the world. This chapter discusses various disruptive technologies, how humans are struggling to live along with the virus, and a future look on how the world will be after the pandemic.

Chapter Preview

Top

Introduction

COVID-19 is perhaps the most uttered word in the past one and half years in almost every country. When it was first identified in China in December 2019, it was thought to be an outbreak, later it was realized as an epidemic. Now it is a pandemic. In the realm of infectious diseases, a pandemic is a worst-case scenario. It has its impact in almost every field and on every individual either directly or indirectly. Millions of people have lost their lives and many are getting affected by it. More and more people are searching for general health-related information in the search engines which can be either media-driven or disease-driven. A general assumption is that the more the volume of data, the better the prediction results will be. In the wake of COVID-19, the spreading of misinformation on social media and other digital platforms is as much a threat to global public health as the virus itself. Less volume of right data can give better results than a large volume of erroneous data. But for those who fear the survival of mankind post-COVID-19, this is not the first of its kind. A few of them are The Black Death in 1347, from which the origin of the word Quarantine took place; the Great Plague in 1665, the 1918 Flu, etc.

This chapter discusses various disruptive technologies like AI, Blockchain, 3D printing, Robotics, Genomics, Distributed Power Systems, IoT, Drones, etc. and their impact during and post COVID period. AI has its applications in the COVID-19 crisis, like in detecting anomalies, diagnosis of medical imagery and symptom data, predicting a person's probability of the infection, monitoring persons who have come in contact with the infected person, deploying drones for the transportation of the materials, deploying virtual assistants, chatbots, robots for serving the infected people, tracking the economic recovery, etc. Blockchain can be used for crisis management, tracking donations, securing the medical supply chains, etc. 3D printing is used in manufacturing face shields, face masks, nasopharyngeal swabs, etc. Understanding genomics will help in identifying the various mutations of COVID-19. Due to the pandemic, most of the people are staying at home and businesses have slowed down due to lock down and hence the commercial power consumption has gone down and the residential load has increased. Hence there is a need for an alternative to distributing the power between the commercial and the residential sectors. In Figure.1, the use cases of various disruptive technologies are listed.

Figure 1. Use Cases for different disruptive technologies

MULTI SUPERVISED FEATURE SELECTION TECHNIQUE (IDS) FOR NETWORKINTRUDERDETECTION

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ABSTRACT:

Searchable encryption has received a significant attention from the research community with various constructions being proposed, each achieving asymptotically optimal complexity for specific metrics (e.g., search, update). Despite their elegance, the recent attacks and deployment efforts have shown that the optimal asymptotic complexity might not always imply practical performance, especially if the application demands a high privacy. In this article, we introduce a novel Dynamic Searchable Symmetric Encryption (DSSE) framework called Incidence Matrix (IM)-DSSE, which achieves a high level of privacy, efficient search/update, and low client storage with actual deployments on real cloud settings. We harness an incidence matrix along with two hash tables to create an encrypted index, on which both search and update operations can be performed effectively with minimal information leakage. This simple set of data structures surprisingly offers a high level of DSSE security while achieving practical performance. Specifically, IM-DSSE achieves forward-privacy, backward-privacy and size-obliviousness simultaneously. We also create several DSSE variants, each offering different trade-offs that are suitable for different cloud applications and infrastructures. We fully implemented our framework and evaluated its performance on a real cloud system (Amazon EC2). We have released IM-DSSE as an open-source library for wide development and adaptation.

DEEP LEARNING METHOD IN NETWORKING INTRUSION DETECTION USING BAT ALGORITHM

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ABSTRACT:

Social networking sites engage millions of users around the world. The users' interactions with these social sites, such as Twitter and Facebook have a tremendous impact and occasionally undesirable repercussions for daily life. The prominent social networking sites have turned into a target platform for the spammers to disperse a huge amount of irrelevant and deleterious information. Twitter, for example, has become one of the most extravagantly used platforms of all times and therefore allows an unreasonable amount of spam. Fake users send undesired tweets to users to promote services or websites that not only affect legitimate users but also disrupt resource consumption. Moreover, the possibility of expanding invalid information to users through fake identities has increased those results in the unrolling of harmful content. Recently, the detection of spammers and identification of fake users on Twitter has become a common area of research in contemporary online social Networks (OSNs). In this paper, we perform a review of techniques used for detecting spammers on Twitter. Moreover, a taxonomy of the Twitter spam detection approaches is presented that classifies the techniques based on their ability to detect: (i) fake content, (ii) spam based on URL, (iii) spam in trending topics, and fake users. The presented techniques are also compared based on various features, such as user features, content features, graph features, structure features, and time features. We are hopeful that the presented study will be a useful resource for researchers to find the highlights of recent developments in Twitter spam detection on a single. It has become quite unpretentious to obtain any kind of information from any source across the world by using the Internet. The increased demand of social sites permits users to collect abundant amount of information and data about users. Huge volumes of data available on these sites also draw the attention of fake users [1]. Twitter has rapidly become an online source for acquiring real-time information about users. Twitter is an Online Social Network (OSN) where users can share anything and everything, such as news, opinions, and even their moods. Several arguments can be held over different topics, such as politics, current affairs, and important events. When a user tweets something, it is instantly conveyed to his/her followers, allowing them to outspread the received information at a much broader level [2]. With the evolution of OSNs, the need to study and analyze users' behaviors in online social platforms has intensified. Many people who do not have much information regarding the OSNs can

A Novel approach for vehicle detection and predict the green signal time for controlling traffic

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ABSTRACT

Adaptive traffic signal control is the process by which the timing of a traffic signal is continuously adjusted based on the changing arrival patterns of vehicles at an intersection, usually with the goal of optimizing a given measure ofeffectiveness. Herein, a methodology is developed in which the characteristics of a traffic signal cycle are optimized at the conclusion of every phase based on the arrival times of vehicles to an intersection, using stopped delay as the measure of effectiveness. This optimization is solved using metaheuristic search procedures, namely tabu search, and embedded in an algorithm in which current vehicle arrival times are detected, arrival patterns over a specified horizon are predicted, the traffic signal timing is optimized, and the timings are sent to a traffic signal controller. The methodology is shown to provide improvement in performance for a number of intersection configurations and traffic regimes over traditional forms of trafficsignal control, and the metaheuristic search is demonstrated to significantly reduce the computation time for a solution as compared with other search procedures

INTRODUCTION

The timing of traffic signal has a direct impact on the utilization of available infrastructure. There are two mode of traffic signals operation , pre-timed traffic signals, and actuated or controlled traffic signals. In pre-timed mode a control circuits provide a repetitive cycle and split timing. This timing is repeated over and over regardless of the absence or presence of traffic demand as shown in fig.1. The controlled traffic signals use vehicle sensors or detectors to measure the traffic in the different directions and adjust the timing of the traffic signals based on these measurements. This can achieve a large improvement in traffic flow, fuel consumption, pollution ,...etc. There are many technologies to sense and detect vehicles. Inductive-loop traffic detectors,can be used to detect vehicles at a specified location. RADAR and LIDAR technologies also can be used.

Fig.1: pre-timed traffic signal

A Generic method to Analyse and Predict the Heart Disease Using AI

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ABSTRACT: Heart constitutes as one of the foremost important organ of the human body. The natural mechanism of operation of a heart is very complex and failure by any means (disease) is risky to human lives. Various technologies have been found to be effective in the heart diagnosis systems; however, to avoid any kind of medical error and unwanted results, computer-based diagnostic systems are preferred. Recent biomedical research literature emphasizes about is much interest from the scientific researchers in implementing the human intelligence, in health care industry. Various data mining techniques have been used to make clinical decision support systems, to get accurate results on the basis of information collected by researches from the study. To facilitate this, several computational algorithms can be implemented for the effective prediction of heart disease. This review highlights about different bio- inspired algorithms and their implementation specifically for the heartdisease prediction.

INTRODUCTION

A disease in the human body is an unnatural medical condition. It affects negatively the human body organism's functional state. It is generally associated

with few signs of illness in the patient body. According to the World Health Organization (WHO), in the last 15 years, an estimated 17 million people die each year from cardiovascular disease, particularly heart attacks and strokes [1]. Heart disease and stroke are the biggest killers. To predict heart disease, Machine Learning can be used for identifying unseen patterns and providing some clinical insights that will assist the physicians in planning and providing care.Heart disease refers to a series of conditions that include the heart, vessels, muscles, valves, or internal electrical pathways responsible for muscle contraction. According to the Centers for Disease Control and Prevention(CDC), heart disease is one of the leading causes of death in India, the UK, the US, Canada, and Australia. Cardiovascular diseases (CVDs) are a leading cause of clinical (i.e., death and disability), health, and economic burden globally, accounting for approximately 31% (17.9 million) of total deaths each year, One in four deaths in the USA occurs as a result of heart disease [2].Heart disease is common among both men and women in most countries around the world. Therefore, people should consider heart disease risk factors. Although it playsa genetic role, some lifestyle factors significantly affect heart disease. The known risk factors for heart disease;

AN AUTOMATIC DDOS DETECTING SYSTEM (ADDS) USING MACHINE LEARNING

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ABSTRACT: Distributed Denial of Service (DDoS) attacks still poses significant threat to critical infrastructure and Internet services alike. In this paper, we propose ADDS, a moving target defensemechanism that secures service access for authenticated clientsagainst flooding DDoS attacks. ADDSemploys a group oflynamic packet indirection proxies to relay data traffic betweenlegitimate clients and the protected servers. Our designcan effectively inhibit external attackers' attempts too directlybombard the network infrastructure. As a result, attackers willhave to collude with malicious insiders in locating secret proxiesand then initiating attacks. However, ADDScan isolate insiderattacks from innocent clients by continuously "moving" secretproxies to new network locations while shuffling client-to-proxyassignments. We develop a greedy shuffling algorithm to minimizethe number of proxy re-allocations (shuffles) while maximizingattack isolation. Simulations are used to investigate ADDS'seffectiveness on protecting services of different scales againstintensified DDoS attacks.

I INTRODUCTION

Arbor Networks has reported a significant increase in theprevalence of large-scale distributed denial-of-service (DDoS)attacks in recent years [1]. In 2010, the largest reportedbandwidth achieved by a flood-based DDoS attack reached100 Gbps. Meanwhile, the cost of performing a DDoS attackhas turned out to be surprisingly low. A Trend Micro's whitepaper has revealed that the price for 1-week DDoS servicecould be as low as $150 on Russian underground market.A number of mechanisms have been proposed in the pastto prevent or mitigate DDoS attacks. Filtering-based approaches use ubiquitously deployed filters to blockunwanted traffic sent to the protected nodes. Capability-baseddefense mechanisms endeavor to constrain theresource usage by the senders within the threshold permittedby the receivers. Secure overlay solutionsinterpose an overlay network to indirect packetsbetween clients and the protected nodes, aiming to absorb andfilter out attack traffic. However, these static defensesystems either rely on global deployment of ADDS initial functionalitieson Internet routers or require large, robust virtualized networkto withstand the ever-exacerbating attacks. Besides, some of them are still vulnerable to sophisticated attacks, such assweeping and adaptive flooding attacks.In this paper, we propose ADDS, a dynamic DDoS defensemechanismthat adopts moving target defense strategyto protect centralized online services. In particular, ADDSoffers DDoS resilience for authorized and authenticated clientsof security sensitive services such as online banking and finance.ADDS employs a layer of secret moving proxies tomediate all communications between clients and the protectedapplication servers. The network-level filters surrounding theapplication servers only allow traffic from the valid proxy nodes to reach the protected servers.Proxy nodes in ADDS have two important characteristics.First, all proxy nodes are "secret" in that their IP ADDSesses areconcealed from the general public and are exclusively knownby legitimate clients after successful authentication. Each legitimateclient is provided with the IP ADDSress of one workingproxy at any given time to avoid unnecessary informationleakage. We apply existing proof-of- work (PoW) schemes,to protect the client authentication channel.Second, proxy nodes are "moving". As soon as an active proxynode is attacked, it is replaced by another node at a differentlocation, and the associated clients are migrated to alternativeproxies. We show that these characteristics not only enableus to mitigate brute-force DDoS attacks, but also empowerus to discover and isolate malicious insiders that divulge thelocation of secret proxies to external attackers. We do sovia shuffling (repositioning) clients' assignment to new proxynodes when their original proxies are under attack. We developalgorithms to accurately estimate the number of insiders andadjust client-to-proxy assignment accordingly to rescue mostinnocent clients after each shuffle.Our solution does not rely on global adoption on Internetrouters or collaboration across different ISPs to function.Neither do we depend on resource-abundant overlay networkto out-muscle high bandwidth attacks and to provide fault tolerance.Instead, we take advantage of our proxies' secrecy andmobility propertiesto fend off powerful attackers. This entailslower deployment costs while offering substantial defensiveagility, resulting in an effective DDoS protection.

II. THREAT MODEL AND ASSUMPTIONS

Instead of targeting open and general-purpose web services, wefocus on protecting security sensitive online services againstnetwork flooding attacks. The clients of the protected serviceare pre-authorized and their identities can beauthenticatedbefore they are served. We assume a large pool of backupproxies that attackers are incapable of attacking altogether.However, only a small group of proxies are active at any timeto avoid extensive operational costs. An ideal source for theproxy pool is one or several cloud service providers wherecustomers are charged only for running instances.We

ANALYSIS AND EFFECTIVEVISUALIZATION FOR PREDICTING THE CRIME

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ABSTRACT - Big data analytics (BDA) is a systematic approach for analyzing and identifying different patterns, relations, and trends within a large volume of data. In this paper, we apply BDA to criminal data where exploratory data analysis is conducted for visualization and trends prediction. Several the state-of-the art data mining and deep learning techniques are used. Following statistical analysis and visualization, some interesting facts and patterns are discovered from criminal data in San Francisco, Chicago, and Philadelphia. The predictive results show that the Prophet model and Keras stateful LSTM perform better than neural network models, where the optimal size of the training data is found to be three years. These promising outcomes will benefit for police departments and law enforcement organizations to better understand crime issues and provide insights that will enable them to track activities, predict the likelihood of incidents, effectively deploy resources and optimize the decision-making process.

I INTRODUCTION

In recent years, Big Data Analytics (BDA) has become an emerging approach for analyzing data and extracting information and their relations in a wide range of application areas [1]. Due to continuous urbanization and growing populations, cities play important central roles in our society. However, such developments have also been accompanied by an increase in violent crimes and accidents. To tackle such problems, sociologists, analysts, and safety institutions have devoted much effort towards mining potential patterns and factors. In relation to public policy however, there are many challenges in dealing with large amounts of available data. As a result, new methods and technologies need to be devised in order to analyze this heterogeneous and multi-sourced data. Analysis of such big data enables us to effectively keep track of occurred events, identify similarities from incidents, deploy resources and make quick decisions accordingly. This can also help further our understanding of both historical issues and current situations, ultimately ensuring improved safety/security and quality of life, as well as increased cultural and economic growth. The rapid growth of cloud computing and data acquisition and storage technologies, from business and research institutions to governments and various organizations, have led to a huge number of unprecedented scopes/complexities from data that has been collected and made publicly available. It has become increasingly important to extract meaningful information and achieve new insights for understanding patterns from such data resources. BDA can effectively address,the challenges of data that are too vast, too unstructured, and too fast moving to be managed by traditional methods. As a fast-growing and influential practice, DBA can aid organizations to utilize their data and facilitate new opportunities. Furthermore, BDA can be deployed to help intelligent businesses move ahead with more effective operations, high profits and satisfied customers. Consequently, BDA becomes increasingly crucial to organizations to address their developmental issues. As one of the fundamental techniques of BDA, data mining is an innovative, interdisciplinary, and growing research area, which can build paradigms and techniques across various fields for deducing useful information and hidden patterns from data. Data mining is useful in not only the discovery of new knowledge or phenomena but also for enhancing our understanding of known ones. With the support of such techniques, BDA can help us easily identify crime patterns which occur in a particular area and how they are related with time. The implications of machine learning and statistical techniques on crime or other big data applications

EMPLOYEES BEHAVIOUR AND STRESS DETECTION AND ANALYSIS USING MACHINE LEARNING

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ABSTRACT: The main concept of this paper is to detect stress in the IT professionals with the help of Machine learning and Image processing techniques. This paper is an upgraded version of the old stress detection systems which excluded the live detection and the personal counseling but this paper comprises of live detection and periodic analysis of employees and detecting physical as well as mental stress levels in his/her by providing them with proper remedies for managing stress by providing survey form periodically. This paper mainly focuses on managing stress and making the working environment healthy and spontaneous for the employees and to get the best out of them during working hours.

I INTRODUCTION

Stress management systems play a major role to notice the stress levels that disrupt our socio-economic mode. As World Health Organization (WHO) says, Stress may be a psychological state drawback moving the lifetime of one in fourvoters. Human stress results in mental furthermore as socio- fiscal issues, lack of transparency in work, poor operating relationship, depression and eventually commitment of suicide in severe cases. These demands counselling to be provided for the stressed people cope up against stress. Stress turning away is not possible however preventive actions helps to beat the stress. Currently, solely medical and physiological consultants will verify whether or not one is beneath depressed state (stressed) or not. one in every of the normal methodology to notice stress is predicated on form. This methodology, utterly depends on the answers given by the people, folks are going to be unsteady to mention whether or not they square measure stressed or traditional. Automatic detection of stress minimizes the chance of health problems and enhance the welfare of the society. This covers the manner for the need of a scientific tool, that uses physiological signals thereby automating the detectionof stress levels in people. Stress detection is mentioned in varied literatures because it may be a vital social contribution that enhances the approach to life of people. Nowadays becauseIT industries square measure setting a replacement peek within the market by transferal new technologies and merchandisewithin the market. during this study, the stress levels in staff also are noticed to lift the bar high. Although their square measure several organizations United Nations agency give psychological state connected schemes for his or her staff however the problem is much from management during this paper we have a tendency to try and go into the depth of this drawback by making an attempt to notice the stress patterns within the operating worker within the corporations we might prefer to apply image process and machine learning techniques to research stress patterns and to slim down the factors that powerfully verify the stress levels. Machine Learning algorithms like KNN classifiers square measure applied to classify stress. Image process is employed at the initial stage fordetection, the employee's image is clicked by the camera that isinput. so as to urge associate degree increased image or to extract some helpful info from its image process is employedby changing image into digital type and play acting some operations on that. By taking input as a picture from video frames and output is also image or characteristics related to thatimage. Image process primarily includes the subsequent 3 steps:

• Importing the image via image acquisition tools.

• Analyzing and manipulating the image.

• Output within which result's altered image or report that'ssupported image analysis.

II. AIM AND OBJECTIVE

a) Aim

The paper aim is Stress detection in IT professional by image processing and machine learning is to Monitoring the emotionalstatus of a person who is working in front of a computer for longer duration. To Detect and reduce stress and create a much comfortable workplace for IT employees. This system mainly focuses on managing stress and making the working environment healthy and

WEB DATA LEARNING (NRWDL) ALGORITHM TO DETECT DYNAMIC CHANGES IN USERINTERESTS

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ABSTRACT - One of the significant issues facing web users is the amount of noise in web data which hinders the process of finding useful information in relation to their dynamic interests. Current research works consider noise as any data that does not form part of the main web page and propose noise web data reduction tools which mainly focus on eliminating noise in relation to the content and layout of web data. This paper argues that not all data that form part of the main web page is of a user interest and not all noise data is actually noise to a given user. Therefore, learning of noise web data allocated to the user requests ensures not only reduction of noisiness level in a web user profile, but also a decrease in the loss of useful information hence improves the quality of a web user profile. Noise Web Data Learning (NWDL) tool/algorithm capable of learning noise web data in web user profile is proposed. The proposed work considers elimination of noise data in relation to dynamic user interest. In order to valiate the performance of the proposed work, an experimental design setup is presented. The results obtained are compared with the current algorithms applied in noise web data reduction process. The experimental results show that the proposed work considers the dynamic change of user interest prior to elimination of noise data. The proposed work contributes towards improving the quality of a web user profile by reducing the amount of useful information eliminated as noise.

I INTRODUCTION

Nowadays the web is widely used in every aspect of day-to- day life, a daily use of web means that users are searching for useful information [1]-[3]. However, ensuring useful information is available to a specific user has become a challenging issue due to the amount of noise data present onthe web [4]. Noise in web data is defined as any data that is not part of the main content of a web page [5], [6]. For example, advertisements banners, graphics, web page links from external web sites etc. Noise web data elimination is a concept which involves detection of web data that needs to be eliminated because it either does not form part of the main web page content or is not useful to a given user [7]. Itis recognized in the current research work [8] that the noise web data reduction process is site-specific, i.e. it involves removal of external web pages that do not form part of the main web page content. However, this work does not focus on the structure and layout of web data to identify and eliminate noise but instead, a key focus is on extracted web log data that defines a web user profile. In view of this research, noise is not necessarily advertisements from external web pages, duplicate links and dead URLs or any data that does not form a part of the main content of a web page, but also useful information that does not reflect dynamic changes in user interests. Various machine learning tools/algorithms are used to discover usefulinformation from web data, this process is referred to as web usage/data mining process. It finds user interest patterns from web log data. Web log data contains a list of actions that have occurred on the web based on a user [9]. These log files give an idea about what a user is interested in available web data. Web log data contain basic information such as IP address, user visit duration and visiting path, web page visited by the user, time spent on each web page visit etc. In this work, web log file and web data are used interchangeably because a log file contains web data, therefore elimination of noise web data is based on extracted web user log file. In a real world, it is practically impossible to extract web log data and create a web user profile free from noise data. A web user profile is defined as a description of user interests, characteristics, and preferences on a given website. User interests can be implicit or explicit. Explicit interests are where a user tell the system what his/her interests are and what they think about available web data while implicit interest is where thesystem automatically finds interests of a user through various means such as time and frequency of web page visits. Many users may not be willing to tell the system what their true intentions are on available web data, therefore, this work will focus on implicit user interests. Current research efforts in noise web data reduction have worked with the assumption that the web data is static. For example, proposed a mechanism where noise detected from web pages is matched by stored noise data for classification and subsequent elimination. Therefore, it shows thatelimination of noise in

Application of NLTP for Online Fake products Review analysis andmonitoring

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ABSTRACT

Online Shopping is increasing day by day and more people are interested in buying the products of their need from the online stores. This type of shopping takes less time and easy forcustomer. Customer searches the item of his/her need through online store and place the order. Only by looking at the rating and by reading the reviews related to the particular product customer places the order. Customer takes comments of other people as the source of satisfaction for the new product buyer. Here there is a possibility that the single negative review changes the angle of the customer not to buy that product. So it is possible that one review among multiple reviews is fake. This creates the difficult situation for the customer to read fake reviews and to make a decision whether to buy or not the product. In order to remove this type of fake reviews a, we proposes a Fake Product Review Finding and Reducing System to provide the users with the original reviews and rating for the products. In our proposed system, we can find the given review is genuine or fake so that User can buy a genuine product.

1. INTRODUCTION

One of the very rapid growth areas is ecommerce. Generally e-commerce provides facility for customers to write reviews related with its service. The existence of these reviews can be used as a source of information. For examples, companies can use it to make design decisions of their products or services

but unfortunately, the importance of the review is misused by certain parties who tried to create fake reviews, both aimed at raising the popularity or to discredit the product. They share their thoughts on internet. Before purchasing anything, it is a normal human behaviour to do a survey on that product. Based on reviews, customers can compare different brands and can finalize a product of their interest. These online reviews can change the opinion of a customer about the product. If these reviews are true, then this can help the users to select proper product that satisfytheir requirements. On the other hand, if the reviews are manipulated or not true then this can mislead user. This boosts us to develop a system which detects fake reviews for a product by using the text and rating property from a review. The honesty value and measure of a fake review will be measured by utilizing the data mining techniques. An algorithm could be used to track customer reviews, through mining topics and sentiment orientation from online customer reviews and will also blocked the fake reviews.

1.1 Objective of the project:

In the current scenario, the data on the web is growing exponentially. Social media is generating a large amount of data such as reviews, comments, and customer's opinions on a daily basis. This huge amount of user generated data is worthless unless some mining operations are applied to it. As there are

Ethical Dimensions in Data Science:
Novel Perspectives

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ABSTRACT

The paper related to ethics in data science advocates the novel perspectives related to this field in which we discuss primarily about the need of ethics in data science. We also present guidelines to follow ethical means in this area and present the guidelines prevalent in current organisations dealing with data science projects. We conclude by presenting few tips on how to enforce ethics and sustain them in the long run of data science.

Keywords - *Classification, Data science, Ethics, Intelligence, ,Moral*

1.INTRODUCTION

In this paper we throw light on few dimensions of ethics while operating in the field of data science. Along these lines, Ethics in the broadest sense alludes to the worry that people have consistently had for making sense of how best to live. The savant Socrates is cited as saying in 399 B.C. that "the most important thing is not life, but the good life."We would all like to avoid a bad life, one that is shameful and sad, fundamentally lacking in worthy achievements, unredeemed by love, kindness, beauty, friendship, courage,honor, joy, or grace.

As the time goes on and the earth is getting old so many new companies are building themselves from the ashes and they have to need someone to handle their data. So they need a young statistician in the form as a data scientist to handle their data. As we see data is the most important and the main pillar of the company if data is the pillar then data scientist is the protector that pillar so he have to make sure that no one would attack that pillar in his watch. For fulfilling his work he have to follow some ethics. So the main goal of this paper is to make the young data scientists to learn how important they are in the part of the growth of the company and let them know how their professional ethics are going to play a crucial role in their work. As they are going to be the main pillar of the company business they have

An Investigative Study on Minimising Security Attacks using Deep learning in a Cyber Physical System

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Abstract-Irregularity identification is essential to guarantee the security of cyber-physical systems (CPS). Be that as it may, because of the expanding intricacy of CPSs and more modern assaults, traditional inconsistency recognition strategies can't be straightforwardly applied to defeat such issues, which additionally need area explicit information and handle the developing volume of information. Profound learning-based peculiarity discovery techniques have been proposed to accomplish solo recognition in the period of CPS huge information. In this paper, we audit best aspects of these deep learning strategies in CPSs. We propose a scientific categorization as far as the sort of peculiarities, techniques, and usage and assessment measurements to comprehend the fundamental properties of current strategies. Further, we use this scientific categorization to recognize and feature new qualities and plans in every CPS area. We sum up top notch of openly accessible datasets for preparing and assessment. We additionally talk about our discoveries, the restrictions of existing investigations, and potential headings to improve security in CPS using deep learning techniques.

Keywords-Deep Learning; Anomaly detection; Cyber Physical Systems; Security; Privacy

I. INTRODUCTION

Cyber-physical systems (CPS) are increasingly being deployed in basic infrastructures. The CPS market is expected to expand by 9.7% each year, which will reach $9563 million by 2025. Prominent uses of CPS include mechanical control systems (ICS), shrewd grid, intelligent transportation systems (ITS), and aerial systems. CPSs have evolved to be complex, heterogeneous, and integrated to provide rich functionalities. However, such characteristics additionally expose CPSs to broader threats. According to FireEye's report, insiders, ransomware, market control, etc. are among the top assault types in ICS. Recent incidents (e.g., Stuxnet, Ukraine power grid outage, auto-driving crashes, robot malfunction) have indicated that sophisticated and stealthy assaults (and blames) can result in calamitous consequences to the economy, environment, and even living souls. Subsequently, it is central critical to ensure the security of CPSs. To detect assaults and unexpected errors in CPSs, anomaly detection methods are proposed to mitigate these threats. For example, rule, state estimation (e.g., Kalman filter), statistical model (e.g., Gaussian model, histogram-based model) based methods are utilized to learn normal status of CPSs [64]. However, these methods usually

require expert knowledge (e.g., operators manually extract certain rules), or need to know the underlying dispersion of normal information. Machine learning approaches don't rely on space specific knowledge. Yet, they usually require a large amount of labelled information (e.g., order based methods). Likewise, they can't capture the unique attributes of CPSs (e.g., spatial-temporal correlation) . Interruption detection methods are dedicated to ensuring network correspondence security. Physical properties (e.g., the noise of engines) are captured to depict the immutable nature of CPSs. Program execution semantics are characterized to protect control systems. However, as CPSs become more complicated what's more, assaults are more stealthy (e.g., APT assaults), these methods are difficult to ensure the overall status of CPSs (e.g., protect multivariate physical measurement) and need more space knowledge (e.g., more components and correlation). Anomaly detection systems need to adjust to capture new characteristics of CPSs. Specifically, we need to answer three research questions:

(1)What are the characteristics of existing approaches? Specifically, the threat model, detection strategies (i.e., input information, neural network design, and anomaly scores), implementation and evaluation metrics of Deep Learning methods are definitely not categorized.

(2) What are the takeaways and impediments of existing work? Are there freely available datasets?

(3) How would we be able to improve Deep Learning methods?

Answering these questions helps to understand the fundamentals of Deep Learning methods, evaluate proposed DLAD models, and explore new arrangements.

II. BACKGROUND

A. Complexity Management

Anomaly detection has developed for various applications, e.g., intrusion detection, fraud detection. In this work, we centre on new research efforts that detect anomalies in CPS with the help of emerging deep learning methods. We can concisely characterize the generic work process of Deep Learning methods. Normally, Deep Learning methods comprise of training and testing phases. At the training phase, a large amount of info information is first collected. Sensor and actuator information, level 0 and level 1 correspondence traffic, and control system logs are regularly used information sources. Different customized

International Journal of Circuit, Computing and Networking

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Assessment of smart agriculture in developing countries: Principles, current trends, future directions

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Abstract

The approach of Internet of Things (IoT) has demonstrated another bearing of imaginative research in rural space. Being at incipient stage, IoT should be generally tested in order to get broadly applied in different rural applications. To concentrate on the particular prerequisites the gadgets, and wireless correspondence advancements related with IoT in horticultural and farming applications are dissected thoroughly. Examinations are made on these sensor empowered IoT systems that offer insightful and smart types of assistance towards smart agriculture. Different contextual investigations are introduced to explore the existing IoT based arrangements performed by different organizations and people and categories according to their sending parameters. This paper discusses smart agriculture principles and how they are currently used in many developing nations. This paper will act a readymade guide to researchers who want to initiate novel methods in smart agriculture as well as know the challenges present in this area.

Keywords: internet of things, smart, automated, agriculture

Introduction

Agriculture is consistently the foundation of many creating nations. It doesn't just fill the individuals midriff yet in addition it is the piece of economy. As indicated by study in, India's populace is practically equivalent to 1.30 billion, which is actually a colossal number. In worry of giving nourishment to such a major populace there must be another innovation giving more yield in brief period. In that way, nature is intricate which will have irregular characteristics which straightforwardly influences plants and crops and by implication creatures and human. Different variables which influence agriculture are lacks in large scale and smaller scale supplement content, populace blast, industrialization, exhaustion of water source, distinction in soil condition, and disintegration of top soil. In agriculture the principle motivation to utilize manure is to give undeniable large scale and miniaturized scale supplements which for the most part soil needs. 35-40% of the yield profitability relies on manure, yet a portion of the compost influences the plant development directly. To conquer every one of these downsides a more astute way i.e., nanotechnology can be one of the source. Since manures are the fundamental concern, creating nano based compost would be another innovation right now. Manures are showered from numerous points of view either to soil or through leaves, even to oceanic conditions; these inorganic manures are provided so as to give three primary segments, nitrogen, phosphorous and potassium in equivalent proportions. It expands the Nutrient use proficiency (NUE) by multiple times and it additionally gives pressure enduring capacity. Independent of the kind of yield it can be utilized, it will be the finished bio source expanding the eco benevolent nature, manufactures carbon take-up, improves soil collection. Since these nano manures contain supplements, development advertisers typified in nano scale polymers, they will likewise have a moderate and a directed effective discharge. Nanotechnology is gathering data of molecule in nano scale run, with considering the physical, synergist, attractive, optical properties. Be that as it may, the convergence of use constantly uncovered soil organisms and smaller scale fauna, as well as the plants themselves, to level of compound reactivity that might be poisonous. When contrasting with substance manures prerequisite and cost, nano manures are monetarily modest and are required in lesser sum. For quite a long time ranchers have discovered that nitrogen take-up is the fundamental explanation behind inappropriate yield. In past ongoing days advancement of detecting gadgets are in blast. At the point when it

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Location Prediction on Twitter Using Machine Learning Techniques

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Abstract - Location prediction of users from online social media brings considerable research these days. Automatic recognition of location related with or referenced in records has been investigated for decades. As a standout amongst the online social network organization, Twitter has pulled in an extensive number of users who send a millions of tweets on regular schedule. Because of the worldwide inclusion of its users and continuous tweets, location prediction on Twitter has increased noteworthy consideration in these days. Tweets, the short and noisy and rich natured texts bring many challenges in research area for researchers. In proposed framework, a general picture of location prediction using tweets is studied. In particular, tweet location is predicted from tweet contents. By outlining tweet content and contexts, it is fundamentally featured that how the issues rely upon these text inputs. In this work, we predict the location of user from the tweet text exploiting machine learning techniques namely naïve bayes, Support Vector Machine and Decision Tree.

Index Terms - online social network organization, Tweets, naïve bayes, Support Vector Machine and Decision Tree.

I.INTRODUCTION

Users may post explicitly their location on the tweet text they post, whereas in certain cases the location may be available implicitly by including certain relevant criteria. Tweets are not a strongly typed language, in which users may post casual with emotion images. Abbreviated form of text, misspellings, and extra characters of emotional words makes tweet texts noisy. The techniques applied for normal documents are not suited for analysing tweets. The character limitations of tweets about 140 characters may make the tweet uneasy to understand if the tweet context is not studied.

The issue of location prediction related named as geo location prediction is examined for Wikipedia and web page documents. Entity recognition from these formal documents has been researched for years. Different types of content and context handling on these documents are also studied extensively. However, the location prediction problem from twitter depends highly on tweet content. Users living in specific regions, locations may examine neighborhood tourist spots, landmarks and buildings and related events.

II. PROCEDURE FOR PAPER SUBMISSION

A. Review Stage
Submit your manuscript electronically for review. prepare it in two-column format, including figures and tables(untill it doesn't fit properly and data is not visible).

B. Final Stage
After your paper has been accepted. The authors of the accepted manuscripts will be given a copyright form and the form should accompany your final submission.

C. Figures
As said, to insert images in Word, position the cursor at the insertion point and either use Insert | Picture | From File or copy the image to the Windows clipboard and then Edit | Paste Special | Picture (with —Float over textl unchecked).

III. EXISTING SYSTEM

In the Existing system to the problem of finding location from social media content. The Social Networks from and motivated by Term frequency (TF) and inverse document frequency (IDF), they arrived Inverse City Frequency (ICF) and Inverse Location Frequency (ILF) respectively. They raked the features by using these frequency values and TF then by TF values. From this they arrived those local words spread in document in few places and have high ICF and ILF values. They approached model for identifying local words indicative or used in certain locations only.

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

AN ANALYSIS OF MACHINE LEARNING CLASSIFIERS IN BREAST CANCER DIAGNOSIS

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Abstract: In the field of assisted cancer diagnosis, it is expected that the involvement of machine learning in diseases will give doctors a second opinion and help them to make a faster / better determination. There are a huge number of studies in this area using traditional machine learning methods and in other cases, using deep learning for this purpose. This article aims to evaluate the predictive models of machine learning classification regarding the accuracy, objectivity, and reproducible of the diagnosis of malignant neoplasm with fine needle aspiration. Also, we seek to add one more class for testing in this database as recommended in previous studies.

We present six different classification methods: Multilayer Perceptron, Decision Tree, Random Forest, Support Vector Machine and Deep Neural Network for evaluation. For this work, we used at University of Wisconsin Hospital database which is composed of thirty values which characterize the properties of the nucleus of the breast mass. As we showed in result sections, DNN classifier has a great performance in accuracy level (92%), indicating better results in relation to traditional models. Random forest 50 and 100 presented the best results for the ROC curve metric, considered an excellent prediction when compared to other previous studies published.

Index Terms - Diagnosis of malignant neoplasm, Multilayer Perceptron, Decision Tree, Random Forest, Support Vector Machine and Deep Neural Network.

I. INTRODUCTION

In Brazil, for the biennium 2018-2019, 59,700 new cases of breast cancer are anticipated. Breast cancer accounts for 25.2% of female malignancies and an incidence rate of 43.3 /100,000 women. An estimated in 522,000 deaths a year, breast cancer is responsible for 14.7% of all deaths. Although it has a higher mortality rate than other malignancies, it has a low fatality because its mortality rate is less than 1/3 of the incidence rate. It is the most surviving cancer type annually, approximately 8.7 million. In developed countries the numbers have stabilized, followed by a drop in the last decade. In underdeveloped countries, detection occurs in more advanced stages, contributing to the treatment-related morbidity rate .The disruptive technology applications in the health area have been focused on studying the potential impact on human society.

Regarded the assisted cancer diagnosis, it is expected that the involvement of machine learning in diagnosis could provide doctors a second opinion and help them to make a faster/ better diagnosis. Recently, Google reached an accuracy level in identifying skin cancers, suggesting that the cancer accessibility diagnosis could potentially be extended for aside from medical clinics. The application employed Deep Learning to train a neural network classifier with one of the Wisconsin breast cancer data sets (diagnosis), using the classifier to predict the mammary mass prediction with 30 real numerical values that characterize the cell nucleus properties of mammary mass. Although many studies have been studied breast cancer prediction/classification, we propose a study using a specific algorithms group, containing a random forest split for diversified analyzes.

SOFTWARE ENGINEERING

Common to B.Tech CSE & IT

Dr.S.Suresh

Dr.N.Naveen

M.Raj Kumar

A SCALABLE SYSTEM FOR IDENTIFYING SIMILARITY OF DATA FROM DOCUMENTS USING AI

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ABSTRACT - **Today, much more than in the past are discussed of plagiarism in the research. Conditions of the Web and Possibility of complex and smart searches in a short time, are rated to this, and as a result has arrived significant damages to the research. Tools designed to deal with plagiarism act on the text and ignore images. On the other, an inseparable part of information transfer is images that transfer the large volume of information in an article or scientific research. Because of the images include a very wide range and especially found large amounts of flowchart images in the computer's texts, and as respects, flowcharts are carrying a lot of information, could be one of the options of plagiarism. The purpose of this paper is examining the plagiarism rate of a paper in terms of flowchart images plagiarism using artificial neural network. The average of flowchart images recognition accuracy in terms of structure, nodes and edges in the proposed method with 81.91 percent, indicating the success of this method.**

I INTRODUCTION

Academic plagiarism has been defined as "the use of ideas, concepts, words, or structures without appropriately acknowledging the source to benefit in a setting where originality is expected". Forms of academic plagiarism vary in their degree of obfuscation ranging from unaltered copies (copy , paste), to slightly altered forms of plagiarism, such as interweaving text passages from multiple sources (shake , paste), to disguised forms of plagiarism, including paraphrases, translations, and ideaplagiarism, and even the plagiarism of academic data. The easily identifiable copy&paste-type plagiarism is more prevalent among students, while heavily modified plagiarism is more characteristic of researchers, who have strong incentives to avoid detection by skillfully disguising unoriginal content. Research on plagiarism detection (PD) has yielded mature systems employing text retrieval to find similar documents. These systems reliably retrieve documents containing copied text, but often fail to identify disguised f rms of academic plagiarism. As we briefly explain in Section 2, several approaches have been introduced to complement text-matching methods and to improve the detection capabilities for disguised forms of plagiarism. Compared to the many sophisticated text-based retrieval approaches that have been proposed for PD, analyzing images to detect academic plagiarism has attracted little research. In this paper, we examine the use of image similarity detection techniques as a promising method for plagiarism detection when textual similarity is lacking. For our use case, we define 'images' as the visual representations of data, e.g., in the form of bar charts, scatter plots, graphs, etc., as well as of concepts in the form of figures showing the schematicrepresentations of entities and their relations, e.g., flow charts, organigrams, and component diagrams. Our definition also includes photographs and photo-realistic renderings. Images enable conveying much information in a compressed format, and they represent this information differently from the information conveyed in text. These characteristics make images a promising feature to examine when assessing the semantic similarity present in academic documents. Identifying semantic similarity is crucial for detecting translated plagiarism and idea plagiarism. In some cases, even the plagiarism of data becomes detectable if the data values can be reconstructed from graphs. The paper is structured as follows. In Section 2, we briefly present general PD approaches and previous work on image-based PD.

Novel system for online User data verification and comparison from E-Government using AI

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ABSTRACT

Artificial Intelligence (AI) has recently advanced the state-of-art results in an ever-growing number of domains. However, it still faces several challenges that hinder its deployment in the e-government applications–both for improving the e- government systems and the e- government-citizens interactions. In this paper, we address the challenges of e- government systems and propose a framework that utilizes AI technologies to automate and facilitate e-government services. Specifically, we first outline a framework for the management of e-government information resources. Second, we develop a set of deep learning models that aim to automate several e- government services. Third, we propose a smart e-government platform architecture that supports the development and implementation of AI applications of e- government. Our overarching goal is to utilize trustworthy AI techniques inadvancing the current state of e- government services in order to minimize processing times, reduce costs, and improve citizens' satisfaction.

INDEX TERMS Artificial intelligence,deep learning, E-government, web services.

INTRODUCTION

Artificial Intelligence (AI) has been around for some decades in several theoretical forms and complicated systems; however, only recent advances in computational powers and big data have enabled AI to achieve outstanding resultsin an ever-growing number of domains. For example, AI have tremendously advanced the areas of computer vision, medical applications, natural language processing, reinforcement learning, and several other domains.AI can be defined asthe ability of a computer to imitate theintelligence of human behavior while improving its own performance. AI is not only robotics, rather an intelligent behavior of an autonomous machine that describes the brain of the machine and not its body; it can drive a car, play a game, and perform diverse sophisticated jobs. AI is a field that falls at the intersections of several other domains, including Machine Learning, Deep Learning, Natural Languages Processing, Context Awareness, and Data

Deep Learning based Automatic and Heigh Efficient Chat Bot

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ABSTRACT

:Many organizations are executing Chatbots toaddress client inquiries and contact clients. Asindicated by Mindshare, 63% of shoppers wouldconsider utilizing a chatbot when visiting abusiness or brand's site. One of the fundamental AIchatbot benefits is that it can convey momentsatisfaction. Individuals would much preferablyvisit online over set aside the effort to call anorganization's 800- number. During these difficultSituations it is hard for individuals to go to thestores to purchase something, to emergency clinicfor a little clinical test, finding support for an itemthat you purchased and so forth So these sorts ofeasier errands, which don't require actual presence,can be supplanted by chatbots. So we will make achatbot, which when given reasonable purposedocuments dependent on a specific item ornecessities, can prepare on it utilizing variousLayers Neural Networks and make a model.Utilizing this model our chatbot can answer clientinquiries.

1. INTRODUCTION

In this day and age, the way we associate with ouradvanced gadgets is generally confined in view ofwhat highlights and how much openness everygadget offers. There is an expectation to absorbinformation related to each new gadget weinterface with. Chatbots take care of this issue byconnecting with aclient utilizing textindependently. Chatbots areright now the mosteffortless way. We have software to be local topeople since they have an encounter orconversation with someone.

Since chatbots copy areal individual, Artificial Intelligence (AI)strategies are utilized to construct them. One suchprocedure inside AI is Deep Learning whichimpersonates the human mind. It discovers patternsfrom the training data and utilizes the same patternsto process new data. Deep Learning is promising totake care of long-standing AI issues like ComputerVision and Natural Language Processing (NLP),with Google putting $4.5 million in Montreal AILab notwithstanding a government AI award of $213 million. The current chatbots which are near,such as Siri, Alexa, Cortana and Google Assistantface challenges in understanding the aims of theclient and consequently become hard to manage. Inparticular, these chatbots can't monitor the specificcircumstance and endure in long-going discussions.They can't make an intelligent and connecteddiscussion between two individuals on famouspoints like ongoing news, governmental issues andsports.In thispaper we initially discuss what is Deeplearningand find out which model is compatible totraina chatbot and show you a way to create adeeplearning based chatbot which can understand thehuman language and give appropriate responses. And the steps to create the chatbot.

2. LITERATURE SURVEY

According to research "Chatbot Utilization forMedical Consultant System" Medical services

Application of Deep learning for vehicle accident detection using CCTV videos

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Abstract: Accidents have been a major cause of deaths in India. More than 80% of accident-related deaths occur not due to the accident itself but the lack of timely help reaching the accident victims. In highways where the traffic is really light and fast-paced an accident victim could be left unattended for a long time. The intent is to create a system which would detect an accident based on the live feed of video from a CCTV camera installed on a highway. The idea is to take each frame of a video and run it through a deep learning convolution neural network model which has been trained to classify frames of a video into accident or non- accident. Convolutional Neural Networks has proven to be a fast and accurate approach to classify images. CNN based image classifiers have given accuracy's of more than 95% for comparatively smaller datasets and require less preprocessing as compared to other image classifying algorithms.

1. INTRODUCTION

Over 1.3 million deaths happen each year from road accidents, with a further of about 25 to 65 million people suffering from mild injuries as a result of road accidents. In a survey conducted by the World Health Organisation (WHO) on road accidents based on the

income status of the country, it is seen that low and middle-income or developing countries have the highest number of road accident related deaths. Developing countries have road accident death rate of about 23.5 per 100,000 population, which is much higher when compared to the 11.3 per 100,000 population for high-income or developed countries [1]. Over 90% of road traffic related deaths happen in developing countries, even though these countries have only half of the world's vehicles. In India, a reported 13 people are killed every across the country. However, the real case scenario could be much worse as many accident cases are left unreported. With the present data, India is on the way to the number one country in deaths from road accidents due to the poor average record of 13 deaths every hour, which is about 140,000 per year [2]. An accident usually has three phases in which a victim can be found. First phase of an accident is when the death of the accident victim occurs within a few minutes or seconds of the accident, about 10% of accident deaths happen in this phase. Second phase of an accident is the time after an hour of the accident which has the highest mortality rate (75% of all deaths). This can be avoided by timely help reaching the victims. The objective is to help accident victims in this critical hour of need. Third phase of an accident occurs days or weeks after

the accident, this phase has a death rate of about 15% and takes medical care and resources to avoid. Fig. 1. Comparative analysis of population, income and road accidents The main objective is to incorporate a system which is able to detect an accident form video footage provided to it using a camera. The system is designed as a tool to help out accident victims in need by timely detecting an accident and henceforth informing the authorities of the same. The focus is to detect an accident within seconds of it happening using advanced Deep Learning Algorithms which use Convolutional Neural Networks (CNN's or ConvNet) to analyze frames taken form the video generated by the camera.

We have focused on setting up this system on highways where the traffic is less dense and timely help reaching the accident victims is rare. On highways we can setup CCTV camera's placed at distance of about 500 meters which act as a medium for surveillance, on this camera we can set up the proposed system which takes the footage from the CCTV camera's and runs it on the propsed accident detection model in order to detect accidents. In this system, we have a Raspberry Pi 3 B+ Model which acts as a portable and remote computer to be set up on a CCTV camera. For demonstration purposes, we will be using a Pi Camera which can be directly set up on a Raspberry Pi. We have pre-trained an Inception v3 model to be able to detect accidents by training it on two different sets of images and sequence of video frames. The images and video frames are 10,000 severe accident frames and 10,000 non- accident frames. The Inception v3 algorithm can now detect an image or frames of a video to be an accident frame by up to 98.5% accuracy. This model was then implemented on a Raspberry Pi using TensorFlow, OpenCV and Keras. When a video is shown to the Raspberry Pi through the Pi camera, it runs each frame of the video through the model created and then predicts whether the given frame is an accident frame or not. If the prediction exceeds a threshold of 60% or 0.6 the Raspberry Pi then initiates the GSM module setup with it to send a message to the nearest hospital and police station, informing them about the accident which has been detected with the timestamp of when it occurred, the location of where it occurred, and the frame at which

IDENTIFICATION AND ANALYSIS USING DEEP LEARNING MECHANISMS

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ABSTRACT: Diabetic retinopathy (DR) is acomplication of diabetes that severely affects eyes. It can be graded into five levels of severity according to international protocol. However, optimizing a grading model to have strong generalizability requires a large amount of balanced training data, which is difficult to collect, particularly for the high severity levels. Typical data augmentation methods, including random flipping androtation, cannot generate data with high diversity. In this paper, we propose a diabetic retinopathy generative adversaria lnetwork (DR-GAN) to synthesize high-resolution fundus imageswhich can be manipulated with arbitrary grading and lesioninformation. Thus, large-scale generated data can be used formore meaningful augmentation to train a DR grading andlesion segmentation model. The proposed retina generator isconditioned on the structural and lesion masks, as well as adaptive grading vectors sampled from the latent grading space,which can be adopted to control the synthesized grading severity.Moreover, a multi-scale spatial and channel attention moduleis devised toimprove the generation ability to synthesize smalldetails. Multi-scale discriminators aredesigned to operate fromlarge to small receptive fields, and joint adversarial losses areadopted to optimize the whole network in an end-to-end manner.With extensiveexperiments evaluated on the EyePACS datasetconnected to Kaggle, as well as the FGADR dataset, we validatethe effectiveness of our method, which can both synthesize highlyrealistic (1280* 1280) controllable fundus images and contribute to the DRgrading task.

1. INTRODUCTION

Diabetic retinopathy (DR) is a common disease-causingvision loss or even blindness among people with diabetes.Humanophthalmologists usually identify and grade DR severitybased on the type and number of related lesions. Accordingto the international protocol DR severity canbe graded into five levels: normal, mild, moderate, severenon-proliferative diabetic retinopathy (NPDR) and PDR. Therelated lesions consist of hard exudates, soft exudates, hemorrhages,microaneurysms, laser marks, proliferate membranes,etc. It is time-consuming and difficult even forophthalmologiststo diagnose DR, so automatic DR grading models have begun to be explored over the past decades.Several previous works, adopt deep modelsto implement DR grading and obtain substantial improvementover other methods. Compared with handcrafted feature

extraction and traditional machine learningmethods, deepconvolutional neural networks (CNNs)

A NOVEL BLOCKCHAIN METHOD FOR VERIFICATION OF PRODUCT AND FAKES ELIMINATION

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ABSTRACT:

Blockchain technologies have gained interest over the last years. While the most explored use case is financial transactions, it has the capability to agitate other markets. Blockchain remove the need for trusted intermediaries can facilitate faster transactions and add more transparency. This paper explores the possibility to deflate counterfeit using blockchain technology. This paper provides an overview of different solutions in the anti-counterfeit area, different blockchain technologies and what characteristics make blockchain especially interesting for the use case. We have developed three different concepts and the expansion of an existing system concept, is pursued further. It is shown, that reducing counterfeits cannot be achieved by using technological means only. Increasing awareness, fighting counterfeiters on a legal level, a good alert system, and having tamper-proof packaging are all important aspects. These factors combined with blockchain technology can lead to an efficient and comprehensive approach to reduce counterfeiting

Keywords – Authentication, Blockchain, Encryption

I INTRODUCTION

Although it may seem like a far-off idea, we are surrounded by a lot of counterfeits. From fashion and retail products to software, digital media, electronics, piracy, and intellectual property, reports put the cost of counterfeiting somewhere around $600bn a year in the US alone. In fact, the International Chamber of Commerce predicts that the —negative impacts of counterfeiting and piracy are projected to drain US$4.2 trillion from the global economy and put 5.4 million legitimate jobs at risk by 2022. In Pharmaceuticals, the counterfeit medicine market is now responsible for around 1 million deaths per year, in an industry estimated to be worth $75bn annually.In fact, the counterfeit medicine industry is estimated to be growing at twice the rate of legitimate pharmaceuticals, making it up to 25 times more lucrative than the global narcotics trade. Trust is a central element in all transactions. No matter if sending money or exchanging goods, it becomes difficult if there is no trust between the entities involved. It becomes even more difficult, as with many transactions, third parties are involved, such as banks. Often, not only one third-party is involved in a transaction, but multiple. An international money transfer does not only include the bank of the sender, the bank of the receiver, but also multiple intermediary entities such as clearing houses. The entities involved in the transaction do not only have to trust each other, but also the third parties. Removing these third parties can decrease transaction cost, facilitate faster transactions and add

Handling Multifacets of Trust Management in Cyber Physical Systems

Manas Kumar Yogi

Abstract: Trust should be learnt from history and context sensitive. It should not be absolute in nature. Due to the conglomeration of various technologies in a secure cyber physical system it is quite a challenge to handle trust issues in a cyber physical system. Trust management in cyber physical system is needed due to increase in the degree of autonomy, decentralized policies dynamic environment, decision-making based on social rules, customs,laws,values, and ethics. This chapter brings light into the existing strategies already applied by few organizations, their inherent benefits and consequent shortcomings too. There are many factors contributing towards the establishment, expression, evaluation ,maintenance of trustworthiness. In this chapter we advocate a novel framework for trust management which stands up to the research directions of how to build a unified framework for trust management, how to modify the way we compute trust, how to decide the right granularity for a trust model.

Keywords : Trust, Policy ,Reputation, Request, Credential, Revocable.

I. INTRODUCTION

The developing many-sided quality of the artificial intelligence and the connection of autonomous areas, for example, flight, mechanical autonomy and car is a noteworthy block against a comprehensive view CPS. Moreover, expansion of correspondence systems have expanded the span of CPS from a client driven single stage to a generally circulated system, frequently associating with basic foundation, e.g., through shrewd vitality activity. Cyber Physical Systems (CPS) comprise of a mix of various installed subsystems, which work freely of one another and furthermore cooperate with the outside condition. Such implanted frameworks work within the sight of characteristic vulnerability, setting conditions and ill-disposed surenees emerging from both the cyber and physical universes. Security is one of the key ideas to shield the CPS condition and distinctive implanting gadgets with the end goal to have a dependable and secure correspondence stage. There are numerous security methodologies and strategies proposed and executed all inclusive with the end goal to anchor CPS, alongside regions, for example, social building, security measures, merchant control, and also get to control usage, and so on. Nonetheless, notwithstanding these zones, another essential idea, specifically trust, is noteworthy in guaranteeing secure and dependable correspondences in

CPS. In the current best in class, none of the current methodologies talks about the issue of a protected, trust-based CPS. Along these lines, to address this weakness, in this paper, a two-level cover approach is proposed comprising of interior and outer layers of trust among various elements to make dependable and secure CPS. This trust-based structure enhances the certainty of secure substances joining the CPS framework and furthermore assembles connections among elements, along these lines expanding the security shielding the shaped CPS from outside dangers and assaults. Currently most of the trust in CPS are realized using following principles. First one is protecting critical infrastructure from malware threats by separating non-critical from critical operations and concentrating on using hardware isolation to protect control of physical systems. Secondly, Ensuring that any code that has critical operations must be auditable by operators through source code review. The third one accounts for the attestability of processing environment. During operation, each component must be able to verify that data is received and sent only from trustworthy sources. A component also needs to attest its trustworthiness to other components. The last one is minimizing number of entities that needs to be trusted. Reducing the number of trusted entities significantly reduces the attack surface for critical infrastructure. In the ideal trusted CPS solution, the operator will maintain the only root of trust for critical code execution. Social trust is extremely mind boggling and relies upon numerous variables, which makes is hard to display in a computational framework. A few variables which impact trust are: past experience with a man, association with the individual, suppositions of the activities a man has taken, psychological factors affected by a lifetime of history and occasions, talk, and influence by others' assessments. Much work has been done to formalize the idea of social trust into registering situations. There are three principle properties of assume that are significant to creating trust-based computational models: transitivity, asymmetry, and personalization . This exploration endeavors to display every social property in the processing condition to precisely reflect the thought of social trust. The possibility of transitivity is that social trust can be passed between individuals. For instance, Alice profoundly confides in Bob, and Bob very trusts Chuck, despite the fact that Alice does not know Tous, she could in any case determine some feeling of reliability for Chuck. In any case, trust is not splendidly transitive in the numerical sense, since it would not be the situation that Alice profoundly confides in Chuck, a man she has no past connections with. There has been much research in demonstrating the transitivity of trust, additionally alluded to as trust proliferation.

Volume 7 Issue 4 (2019) 298-300   ISSN 2347 - 3258
International Journal of Advance Research and Innovation

Novel Perspectives in Forensics Aware Internet of Things

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Article Info

Article history:
Received 25 January 2016
Received in revised form
20 February 2016
Accepted 28 February 2016
Available online 15 March 2016

Keywords
IoT, Digital Forensics, Forensics-Aware, IoT Forensics, Digital Forensics Model

Abstract

The Internet of Things involves connecting various things with several communication standards and technologies. While Internet of Things opens accessible opportunities in many fields, it announces new threats in the sphere of forensics investigations. The present day procedures and forensic tools cannot fit the widely distributed infrastructure of the IoT. Forensics investigators will experience threats determining, analyzing and collecting that evidence. This paper comes with the working solution of IoT forensics and consistently evaluates the IoT forensics area to examine the threats and issues in this peculiar field of forensics. We recommend a Forensics-aware IoT (FAIoT) model for approving reliable forensics investigations in the IoT environment.

1. Introduction

The Computer forensics is an uninterrupted evolution. This discipline is adapting its approach, tools and methodologies to cover-up advanced contexts. IoT Forensics is the term to describe a modern branch of forensics devoted to the precise features of investigations in Internet of Things scenarios and its requirements. The adaptation of forensics to consider IoT scenarios is indispensable due to numerous characteristics making forensic analysis in the IoT differentiating from other contexts or paradigms. Actual forensic branches cannot be enforced to the requirements imposed by the IoT, namely: • Increase in numerous devices • Huge development of proprietary protocols • bulk of data, making the identification of particular data complex • Urge for advanced formats to supply evidence in IoT devices • Presence of numerous resource-constrained devices.

These threats results in a consequential effort being made towards the definition and implementation of forensic solutions in the context of IoT paradigm. Despite these efforts, forensics solutions have so far ignored the urge for securing individual privacy throughout investigations. This is true even though devices are known to be capable of collecting and storing large amounts of personal information as they are parts of our lives [1]. Not only are smart-phones utilized and deployed among individuals but also wearable's, smart gadgets, and numerous sorts of context-aware devices.

Forensic mechanisms and tools, similar to those utilized for the seizure of evidence at a crime scene, are prepared for static contexts, in which the voluntary participation of citizens is not required. In such scenarios, the conception of witness is applied to individuals, not to devices, or tools. In scenarios, similar to those envisioned by the IoT, the recovery of evidence is complex and it may be important for the investigator to get help from citizens and devices. Without a cooperative approach it is complex to understand the whole context, since the information can be distributed and volatile information could otherwise be lost. This is where the conception of digital witness comes into play. Understanding the conceptual background of IoT, evidence and digital forensic are essentially important for conducting a proper investigation and comes-up with a proposal for enhancing the current research milestones in the field of IoT forensic.

1.1 IoT

Conceptual Consideration While the conception of IoT is not relatively very new, its targeted realization and implementation are yet to be done. It is claimed by different references that the term Internet of Things was initially coined by the director of ID-Auto Labs at MIT - Kevin Ashton in 1999[2]. The main concept of IoT is

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creating an overwhelming "things" with interoperability and communication ability via different suitable protocols such as Radio-Frequency Identification (RFID), Internet and Bluetooth.

This kind of scenario is useful for various applications like smart cities, telemedicine, smart grids, intelligent vehicles and many other applications. Having explained the conception of IoT, it is important to elaborate on the issue of evidence acquisition from IoT. In general cases, the consideration of evidence starts by identifying the crime scene and any directly connected devices to the crime scene.

In IoT, the issue is complex due to sophisticated inter-connectivity where it may seem difficult to reach the exact thing and in worse cases, it may be mistakenly considered. This leads to a numerous ramifications including delaying digital forensic process, misleading the investigation process, further developing the security risks by invading connected surrounding things and finally complicating forensic investigation process by adding a massive amount of exchanged data owing to dense inter-connectivity [3].

1.2 DIGITAL EVIDENCE

Digital evidence can be explained as any intended or unintended trace generated by an electronic device due to digital data movement. We use various electronic devices to approach the needed resources and conduct online and offline transactions every day. The idea is all these activities create a trail ranges from log files and browsing history to data movements such as digital files, online transactions and social media activities.

The created evidence may sound unworthy to Internet users and average electronic devices, yet evidence is complex than its counterpart generated from the current cyberspace. The bulk of data can be exchanged between things in IoT, numerous things are available at the crime scene, the second and third connectivity levels and interoperability of things do create a threat for forensic investigators in terms of identifying relative things in IoT, applicable digital forensic techniques and processing time [4].

The challenge may get more complicated here if the thing is implanted and cannot be seized or disposed of and cannot be retrieved for conducting the forensic analysis. Digital Forensic Digital forensic is characterized by the application of forensic science disciplines to electronic-based crime scenes followed by certain legal approaches [5].

The application of forensic goes back in time for multiple decades where it was originally restricted to computer crimes as the cyberspace had not gained its current popularity back then. The tenets of forensic are usually followed as a fundamental procedure of identifying related electronic devices, acquiring evidence in a verifiable manner, analyzing and preserving the acquired digital evidence, and finally preserving the evidence in a readable and organized format to be admissible before law.

The challenge here is applying this standard digital forensic procedure to IoT network where a blend of actuators, sensors, smart phones, embedded computing devices etc. are all interlinked to bulk of data exchanged between them. The issue begins with identifying

Quantum Inspired Evolutionary Algorithm for Web Document Retrieval

Manas Kumar Yogi ✉ & Darapu Uma

Abstract

This paper describes the importance of quantum inspired evolutionary algorithm for web document retrieval. As size of web increases day by day the popular methods for web document retrieval are taking much time thereby making users concerned about it. Our approach takes inspiration from evolutionary algorithms to model a mechanism which returns experimental results with acceptable accuracy. We have seen from trial results that after some time the general capacity of proposed strategy is superior to the best two most well known methods of web document retrieval. The primary bit of leeway of utilizing our proposed calculation is that its presentation doesn't debase regardless of whether the search space is variable. Irrespective of whether search space is expanding or diminishing the exhibition doesn't drop for our proposed procedure. We discuss comparative performance of the proposed technique with other popular techniques in this area and conclude the paper with future scope of fine tuning the performance of the proposed mechanism with addition other parameters effecting the performance in the mechanism. In future we intend to refine the propose system to suit diverse web prerequisites like customized web search and furthermore for web document retrieval from centralized server databases as well.

Keywords

Quantum   Nature inspired   Evolutionary   Web   Retrieval   Semantics

IOT BASED INTELLIGENT GAS LEAKAGE DETECTOR USING ARDUINO

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ABSTRACT: Liquefied petroleum gas (LPG) is the most used cooking fuel all over India. Since the gas pipelines are old pipes that often get corroded there may be a chance of rupture which results the gas leakage. So, in this paper an IOT based intelligent Gas Leakage detector using Arduino is proposed to detect the leakage of gas. Entire system is controlled by Arduino; the temperature and humidity sensors detect a sharp rise in temperature which indicates that there might be a fire if there is a gas leakage then a message is conveyed by means of an LCD screen and buzzer. Also, with the help of the Wi-Fi module it is capable to send message to the link provided. This system interacts with online IOT system by using THING SPEAK free web interface. After linking with THING SPEAK, the user can send load switching instructions over IOT to the circuit.

KEY WORDS: IOT, Gas Leakage Detector, Arduino and LPG.

I. INTRODUCTION

In the past decade, there was an increase use of liquefied petroleum gases (LPG) and natural gas (consists mainly of methane) to meet the increasing demand for energy and replace oil or coal due to their environmental disadvantages. LPG and natural gas burn cleanly and are less harmful to the environment. They have been widely used in industry, heating, home appliances, and motor fuel [1]. Although LPG and natural gas are environmentally friendly, they can pose a serious threat if they leak. They are normally stored in pressurized steel cylinders in liquid form and vaporize at normal temperatures.

LPG is heavier than air, therefore, it flows along the floor and settle in low points which makes it difficult to disperse. If leak happens, LPG and natural gas boil into air and replace oxygen which can cause suffocation. Moreover, ignition may happen and cause an explosion. Therefore, the detection of gases has gain more interest in recent years especially in fields of safety, industry, environment, and emission control. Household safety is becoming an issue due to the increase use of LPG and natural gas for heating and home appliances. In Jordan (a developing country), besides the huge use of LPG in industry, most of the cooking is done using LPG, and more than 50% of the heaters use LPG [2]. As a result, accidents from gas leakage increase each and every day. In 2007, the number of gas bottles that were destroyed as a result of gas leakage or fire exposure was 142 gas bottles. By considering the number of accidents related to the use of LPG reported by the department of civil defense in 2007 in Jordan. The total number of accidents was 584 that caused 398 injuries and 15 deaths (the population of Jordan is 5 million). Moreover, the number of accidents per year keeps increasing; a percentage increase of 10% was reported from 2006 to 2007 [3].

This work attempts to build a safety device for detecting LPG leak at low levels to avoid any possible accidents. The proposed device monitors the levels of LPG. The device was intended for use in houses where leak of LPG which can pose a serious threat. It was

Original Article

Text Sentiment Analysis using Naïve Baye's Classifier

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Abstract - Sentiment analysis may be a study that analyzes people's opinions, sentiments, evaluations, attitudes, and emotions from written communication. It's one of the foremost active research areas in tongue processing and is additionally widely studied in processing, Web mining, and text mining. This research has pervaded outside of computing to the management sciences and social sciences to business and society as a whole. The evolving importance of sentiment analysis coincides with the expansion of social media like reviews, forum discussions, blogs, micro-blogs, Twitter, and social networks. For the primary time in human history, we now have an enormous volume of opinionated data recorded in digital form for analysis. Today Sentiment analysis is being applied in most businesses and social domains because opinions are key influencers to most human activities and behaviours. Our beliefs and perceptions of reality, and thus the alternatives we make, are largely conditional on how others see and evaluate the earth. For this reason, once we need to make a choice, we often seek out the opinions of others. This is often true not only for individuals but also for organizations. In this paper, we use Naïve Bayes classifiers in determining the sentiment embedded within the textual data.

Keywords - Sentiment Analysis, Naïve Bayes Algorithm, Natural Language Toolkit

I. INTRODUCTION

In this paper, we've discussed how sentiment is extracted from a text. It is a region where the users give their views and opinions to support the case. The main objective of our proposed system is to perform analysis on the text having sentiment, which causes great help to business intelligence on predicting the long run. This document addresses the sentiment analysis on the text, that initial classification is performed on text using Naïve Bayes classifier. Each text is represented within the sort of sentiment asserted in terms of positive, negative and neutral. Performing sentiment analysis is important, which is utilized for hunting out the pros and cons of their products within the market by a public that finishes up in improving their business productivity.

II. PROPOSED MECHANISM

A. Introduction To Sentiment Analysis

The history of the web has changed the way people talk about their perceptions. Nowadays, it is all done through different blog posts, online discussion forums, product review websites etc. People usually rely upon user-generated content on any product to a good extent when it involves performing any desired action. When people want to shop for a product online, they will first search its reviews therein particular product website online before making a call. Some analysis is to be done on these reviews in order that the ultimate outcome says whether the merchandise is nice to shop for or not. There are different sentiment analysis techniques that are available with many applications for various domains, like in business, to induce feedback for products from customers. Cognitive content and Machine learning techniques are two techniques that are mainly used for sentiment analysis. Within the case of the database approach, this needs an oversized database with predefined emotions and an efficient and effective knowledge representation for identifying sentiments. Within the case of Machine learning approach doesn't require any predefined set of emotions. This makes use of a training set so as to develop a sentiment classifier that classifies sentiments from the tweets, and then the machine learning approach is very simpler than the knowledge-based approach. There are different machine learning techniques that are accustomed classify data, i.e., they are naive Bayes classifier, support vector machine, decision tree, random forest, neural networks etc. Classification may be a technique that is employed to perform classification on different sets of information into different classes. These classification techniques are divided into two categories Supervised and unsupervised. In the supervised learning approach, the pc learns from the labelled input file that's given thereto and so makes the pc use this learning which is employed to classify output data. During this, the dataset could also be within the style of a class, i.e., identifying whether the

A Review of Conflict and Co-operational Approaches between Intelligent and Rational Wireless Sensor Networks

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Abstract— wireless sensor networks (WSNs) containing small, control obliged hubs are picking up fame because of their potential for use in a wide assortment of situations like observing of ecological traits, interruption identification, and different military and regular citizen applications. While the detecting targets of these situations are one of a kind and application-subordinate, a typical execution criteria for remote sensor systems is delaying network lifetime while fulfilling inclusion and network in the sending area. Security is another essential execution parameter in remote sensor systems, where antagonistic and remote situations present different sorts of dangers to dependable system operation. In this paper, we take a gander at the issues of security and vitality effectiveness and extraordinary definitions of these issues dependent on the methodology of amusement hypothesis. The potential applicability of WSNs to interloper location conditions additionally fits diversion theoretic formulation of these situations, where interest avoidance recreations give a significant structure to display location, following and observation applications. The appropriateness of utilizing amusement hypothesis to examine security and vitality productivity issues furthermore, interest avoidance situations utilizing WSNs originates from the idea of key communications between hubs. Methodologies from amusement hypothesis can be utilized to upgrade hub level too as system wide execution by abusing the circulated basic leadership capacities of WSNs. The utilization of amusement hypothesis has multiplied, with a wide scope of uses in wireless sensor organizing. In the wake of this expansion, we overview the utilization of diversion theoretic ways to deal with detail issues identified with security and vitality productivity in remote sensor systems.

Keywords— conflict, co-operational, intelligent, rational, wireless

I. INTRODUCTION

A wireless sensor network (WSN) is a wireless network comprising of spatially conveyed self-sufficient gadgets utilizing sensors to screen physical or natural conditions. A WSN framework consolidates an entryway that gives wireless network back to the wired world and conveyed hubs. The wireless protocol you select relies upon your application prerequisites. A portion of the accessible guidelines incorporate 2.4 GHz radios dependent on either IEEE 802.15.4 or IEEE 802.11 (Wi-Fi) principles or exclusive radios, which are generally 900 MHz.WSN made applications for territories including medicinal services, utilities, and remote checking. In health care sector, wireless gadgets make less obtrusive patient observing and social insurance. For utilities, for example, the power matrix, streetlights, and water municipals, wireless sensors offer a lower-cost strategy for gathering framework health care information to lessen vitality use and better oversee resources. Remote observing applications like Environmental checking of air, water, and soil, Structural checking for structures and extensions, Industrial machine checking, Process checking, Asset following permit no wiring expense and make utilization of various estimation applications.

The asset obliged nature of WSNs as far as their size, cost, weight and lifetime is an essential zone of worry for most potential applications utilizing WSNs. Getting it done, the limitations of size, weight and cost of individual hubs have pushed their utilization in a wide assortment of military and non-military personnel applications. Even from a pessimistic standpoint, limitation of the power-restricted nature of hubs which likewise obliges their computational, correspondence and detecting capacities calls for investigation into advancing exchange offs among unwavering quality and drawn out network task. Combined with the natural lack of quality of the wireless channel, conceivable threatening condition in certain application-particular arrangement districts and gadget inconsistency of individual hubs, WSNs are liable to one of a kind difficulties for proficient power administration to delay network lifetime notwithstanding satisfying detecting goals of the application.

Vitality proficiency and accomplishing unwavering quality of information accumulation is a key issue in sensor systems. Vitality effectiveness has been explored broadly and the different ways to deal with accomplish a vitality proficient system incorporate booking sensor hubs to switch back and forth between vitality moderating methods of activity, productive directing calculations, bunching, joining insight and utilization of spatial restriction at each sensor hub to lessen transmission of excess

Classification of Customer to Upgrade Profits in Retail Market with Deep Learning Methodology

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Abstract— Capital investment in retail sector and competition in the market has changed the style of marketing. At the same time the enhancements in the field of information technology provided an upper hand to the marketer to know the exact need, preference and perches trend of the customer. By knowing the actual need, preference and purchase trend of customers the marketer can make a future business plan to increase the sale and earn more profit. This paper provides a framework to the retail marketer to find the potential customer by analyzing the previous purchase history of the customer. This task can be accomplished by the use of data mining technique. In this paper we have used k-mean clustering algorithm and Naive Bayes' classifier for in identifying potential customer for a particular section of products of the retailer.

Keywords—Naive Bayes,Cluster, Centroid,Foreign Direct Investment(FDI)

I. INTRODUCTION

According to the Global Retail Development Index 2012, India ranks fifth among the top 30 emerging markets for retail. The recent announcement by the Indian government with Foreign Direct Investment (FDI) [1] in retail, especially allowing 100% FDI in single brands and multi-brand FDI has created positive sentiments in the retail sector. Since revenue and the competition is increasing in the field of retail marketing therefore every marketer wishes is to increase profits through sales, but this can't be possible without managing customers.

Every business organization has a primary goal to increase sales and through which it earns profit. To increase sales they apply marketing and sales promotion strategies so that customers can know about their product and their promotion activities such as a discount on a particular item or an entire section. Generally for these activities organization apply mass marketing which causes decrease in intensity of effort. If they apply their effort into a particular direction then the intensity of effort will increase. The current marketing and sales promotion in retail field is almost dependent on the mass marketing. The marketer promotes the product to the mass of the customer without knowing their need of such products. Mass marketing is a market coverage strategy in which a firm decides to broadcast a message that will reach

Traditional mass marketing has focused on radio, television and newspapers are the medium used to reach the broad audience. So there is a need to overcome this problem by using computer software methodologies like machine learning[10], Data Mining and several other fields are used.

II. RELATED WORK

The marketer may investigate the reasons a customer or a group has not purchased over a long period of time. On the basis of these three parameters the customers can be grouped into two categories, i.e. more profitable and less profitable category. For this purpose we have used K-mean clustering algorithm[11].
 Basic k-means algorithm:
1. Select K points as initial centroids.
2. Repeat
3. Form k clusters by assigning each point to its closest centroid.
4. Recompute the centroid of each cluster.
5. until centroids do not change.
        Since the k-means algorithm requires weightings point on the basis of that the transaction data can be clustered in the numbers of desired cluster.

Calculation of weighted score:
For the analysis purpose the transaction records of the

Estimating Click Through Rate Using Reinforcement Learning Algorithms

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Abstract: Click-through rate (CTR) prediction is one of the important tasks in business applications like online advertising. It is an integral part of online advertising systems. It is used as an input to auctions which find the final ranking of ads. Machine Learning algorithms are very popular to solve interaction problems. Especially Reinforcement Learning algorithms work very well with these kinds of problems. In this paper, we proposed a model based on two algorithms Upper Confidence Bound and Thompson sampling for better click through rate prediction. The dataset is taken from superdatascience which consists of information about 10 ads. If a user click on the ad, reward is 1, otherwise it is 0.We applied reinforcement learning algorithms to this dataset and computed the total rewards for each of the algorithm separately.

Index Terms–Click-Through Rate (CTR), Machine Learning, Reinforcement Learning, Python

I. INTRODUCTION:

Advertising through search engine has become a significant thing while coming across web browsing [1].These advertising generally using the keyword auction model, and they pay cost of keywords. Pay per click with a cost per click billing is used. Click through Prediction is rigor sly studied in recent years.

Agarwal et al. [2] deals with two stages of click through prediction process. In first step, keywords are predefined and in second step, click through rate for each area is computed. Chakrabarti et al. [3] uses logistic regression and employed a multiplicative factorization to model the interaction effects for several regions.Regelson and Fain [4] proposed Click Through Rate using machine learning hierarchical clusters for the low frequency or completely novel terms. Zhipeng Fang, Kun Yue et al.[1] proposed Click-Through Rates of New Advertisements Based on the Bayesian Network.

The role of machine learning plays a significant factor in online advertisement serving. V. Chaoji et al.[5] explains how important the machine learning is in the real world.Muhammad Junaid et al.[6] proposed Click Through Rate Prediction for Contextual Advertisements Using Linear Regression.

Reinforcement Learning is one type of Machine Learning.It is also called as Online Learning. Reinforcement Learning algorithms are completely different from the supervised and unsupervised machine learning algorithms. Reinforcement Learning is generally used to solve interaction problems means that the data observed up to time k is used to take aaction at time k + 1.Reinforcement learning refers to goal-oriented algorithms, which learn how to attain a complex objective (goal) or maximize along a particular dimension over many steps; for example, maximize the points won in a game over many moves. They can start from a blank slate, and under the right conditions, they achieve superhuman performance. Like a child incentivized by spankings and candy, these algorithms are penalized when they make the wrong decisions and rewarded when they make the right one this is reinforcement. Reinforcement learning algorithms try to find the best ways to earn the greatest reward. Rewards can be winning a game, earning more money or beating other opponents. They present state-of-art results on very human task, for instance. There are three basic concepts in reinforcement learning: state, action, and reward.Dave and Varma [7] used the gradient boosting decision tree (GBDT) to predict the advertising CTR. They extracted similar features from advertising data and discovered implicit relationships between different features. Finally, they found out the nonlinear relationships between the predicted target and features. He et al. [8] introduced a fusion model which combines decision trees with logistic regression for predicting clicks on Facebook ads.

II.RELATED WORK:

The dataset contains 10 ads information in the form of rewards. All these ten are the different versions of the same ad.Here, we need to find which ad is best and suited to put on the social network.We will put the ad that has maximum clicks and best conversion rate. So here the task is find which version of this ad is the best for the user. This dataset is only the simulation. In real life, we are going to start experimenting and placing different version of ad on social network and based on the observed results, we will change our strategy to place these ads on social networks.

Each time a user of social network log in to account, we will place one version of these 10 ads and observe the response of user. If

Application of Kraft–McMillan Inequality for Software Test Case Prioritization

Manas Kumar Yogi, Karri Vijaya Lakshmi, Koondrapu Koushik Sri Sai

Abstract: The motivation behind this prioritization is to improve the probability that if the experiments are utilized for relapse testing in the given request, they will more firmly meet some goal than they would on the off chance that they were executed in some unique request. A few associations want to run "Smoke" or "Sanity" test each time they get another form or form of the creating software. For this situation, experiments will be organize dependent on all the real modules of the software and sanity will be kept running on them to check the fundamental usefulness for instance, in a mobile testing, sanity test suite will have experiments like "restarting the gadget", "killing", "marking in", "refreshing software" etc. Whether the company runs relapse or sanity or both, Test Case Prioritization procedures are pertinent for every one of the cases. Organizing experiments should be possible based on necessities, expenses of bug fixing, history of the parent gadget and so forth. In this paper we apply a novel approach of data structures to develop a friendship relation between similar test cases so as to not spend time on testing similar functional test cases. At the end of the paper we find appreciable experimental results which outweigh the current techniques used in software testing area.

Index Terms: Test case ,Prioritization, Kraft, McMillan, Friendship.

I. INTRODUCTION

Testing is a crucial phase of software Development Life Cycle. Software testers prioritize the test cases which are more important, by some measure, are run earlier in the regression testing process. Regression testing is an costly testing procedure used to validate modified software. If we have thousands of test cases in regression suite and do not have sufficient time to execute all test cases, then we execute the test cases based on prioritization. Whatever the tests may be whether they are smoke, sanity or regression , Test case prioritization techniques are applicable for all the cases and used to schedule test cases. This is useful in order to minimize time, cost and effort during software testing phase. Testers

II. PROPOSED MECHANISM

Our paper proposes a property of Kraft–McMillan inequality to arrange the test cases according to a specific priority order . Kraft's inequality constraints the execution of test cases in a test suite: if we consider an complex and lengthy test suite of , that is, it must have total measure less than or equal to a healthy friendship value. Kraft's inequality can help in identifying test cases which may be redundant or similar and does not affect the quality of the testing process. We have defined a friendship value between 2 trees. Each of these binary trees store test case number which is related to a particular functionality. For each binary tree we apply the Kraft–McMillan inequality to obtain the value of

We Consider a set Ts ={T1,T2,T3..........T100} with 100 test cases and it is equally partitioned into two equal sets Ts1={T1,T2,T3,...........T50} and Ts2={T51,T52,T53,.....T100}with50 testcases in each set. Each set is partitioned into seven binary trees with equal number of testcases because the trees with different number of test cases may not have friendship. Test cases are arranged in a tree based on their prioritization and no testcase should be repeated. Ts11(7), Ts12(7), Ts13(7), Ts14(7), Ts15(7), Ts16(7), Ts17(8) are the trees obtained by dividing Ts1 Set. Ts21(7), Ts22(7), T23(7), Ts24(7), Ts25(7), Ts26(7), Ts27(8) are the trees obtained by dividing Ts2 set. we will calculate Kraft–McMillan inequality for each tree. Now, we will find the Kraft-McMillan difference between each tree in set1 to remaining trees in set2 to calculate the friendship between the trees. The difference is calculated as Kraft(Ts11)- Kraft(Ts21).similarly it is calculated for other trees. The Kraft–McMillan inequality difference is inversely proportional to friendship. If the friendship is between the range 0-0.05 then the two trees are said to have high

IRIS features extraction and recognition using Hough-Circles algorithm and CNN

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ABSTRACT:

Iris recognition has been an active research area during last few decades, because of its wide applications insecurity, from airports to homeland security border control.Different features and algorithms have been proposed for irisrecognition in the past. In this paper, we propose an end-to-enddeep learning framework for iris recognition based on residual

convolutional neural network (CNN) and Hough-Circles, which can jointly learn thefeature representation and perform recognition. We train ourmodel on a well- known iris recognition dataset using only a fewtraining images from each class, and showpromising resultsand improvements over previous approaches. We also presenta visualization technique which is able to detect the importantareas in iris images which can mostly impact the recognitionresults. We believe this framework can be widely used forotherbiometrics recognition tasks, helping to have a more scalable andaccuratesystems

.

1. INTRODUCTION

To personalize an experience or make an application moresecure and less accessible to undesired people, we need tobe able to distinguish a person from everyone else. There arevarious ways to identify a person, and biometrics are one ofthe most secure options so far. They can be divided into

Novel system to Filter And Analysis the Instagram Hash tags Using Hyperlink-induced topic search model

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ABSTRACT:

Instagram is a rich source formining descriptive tags for images and multimedia in general. Thetags–image pairscan be used to train automatic image annotation (AIA) systems in accordance with the learningby example paradigm. In previous studies, we had concluded that, on average, 20% of the Instagram hashtagsare related to the actual visual content of the image theyaccompany, i.e., they are descriptive hashtags,whilethere are many irrelevant hashtags, i.e., stop-hashtags, that are used across totally different images just forgathering clicks and for searchability enhancement. In this paper, we present a novel methodology, based ontheprinciples of collective intelligence that helps in locating those hashtags. In particular, we show that theapplication of a modified version of the well-known hyper link induced topic search (HITS) algorithm, in acrowd- tagging context, provides an effective and consistent way for finding pairs of Instagram images and hashtags, which lead to representative and noise-free training sets for content-based image retrieval. As a proof of concept, we used the crowdsourcing platform Figure-eight to allow collective intelligence tobe gathered inthe form of tag selection (crowd-tagging) for Instagram hashtags. The crowd- tagging data of Figure-eight areused to form bipartite graphs in which the first type of nodescorresponds to the annotators and the second typeto the hashtags they selected. The HITS algorithm is first used to rank the annotators interms of themeffectiveness in the crowd- tagging task and then to identify the right hashtags per image.

1. INTRODUCTION

ROBUST WEAPON DETECTION WITH YOLO TECHNIQUE

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ABSTRACT: Security is always a main concern in every domain,due to a rise in crime rate in a crowded event or suspicious lonely areas. Abnormal detection and monitoring have major applications of computer vision to tackle various problems. Dueto growing demand in the protection of safety, security and personal properties, needs and deployment of video surveillancesystems can recognize and interpret the scene and anomaly events play a vital role in intelligence monitoring. The objective of this paper is to visually detect the handgun in real time videos. The proposed method is using YOLO-V3 algorithm and comparing the number of false positive and false negative with Faster RCNN algorithm. To improve the result, we have created our own dataset of handguns with all possible angles and merged it with ImageNet dataset. The merged data was trained using YOLO-V3 algorithm. We have used four different videos to validate the results of YOLO-V3 compared to Faster RCNN. The detector performed very well to detect handgun in different scenes with different rotations, scales and shapes. The results showed that YOLO-V3 can be used as an alternative of Faster RCNN. It provides much faster speed, nearly identical accuracy and can be used in a real time environment.

I INTRODUCTION

The number of crimes involving guns violence is increasingin many parts of the world, especially in that places where thepossession of guns is legal. [1] Reported incidents caused byguns violence in America in year 201, 2016 and 2017 were333752, 58908 and 61721 respectively. Another study rankedMalaysia in top 10 countries having highest gun violenceinEast, South East and South Asia in year 2016 [2]. Fromthesestatistics, it can be assumed that violence rate concerning gunsare increasing every year becoming a challenge for lawenforcement agencies to overwhelm this issue timely.The solution of this problem is monitoring and earlydetection using control camera or surveillance systems whichcan help to prevent this kind of violence and assist policemenor security agents to act timely.Recently, the area of machine learningmainly in detectionand classification of objects and image segmentation has beenrevolutionized by deep learning. Youlook only once (YOLO)outperformed other detection algorithm at predict in imageswhat objects they are.In this paper, wepresent an automatic gun detection systemusing deep learning mainly YOLOv3 which is compared withthe results of [4].Detecting gun in a scene is very challengingissue because of various subtleties linked with it. Thechallenges in gun detectionare particularly caused by occlusion.Gun to scene and gun to object are the two types of gunsocclusion. Real time processing is another main problem in gundetection system that arisesduring detection. The rest paper isstructured as follows: section 2 describes related work, section3, section 4, section 5.

II. RELATED WORK

Mostly, gun detection research specially emphases onhidden weapon detection and knife detection. Hidden weapondetection is based some techniques of imaging like millimeterwave imaging, infrared imaging used in airport for luggage(containing gun and knife) control applications.The research work in proposed a visual gun detectionsystem based on Harris interest point and SIFT. They usedcolor-based segmentation to select dissimilar object from animage by deploying K-mean cluster algorithm, researchers used 3D millimeter wave imaging technique todetect the weapon concealed in the body and other hiddenlocation.In another work, researchers deploy a real time gunclassifier that detects and classify guns. They also usedImageNet dataset for training their model and acquired a mAPof 89% using overfeat-3 algorithm. The research work, isbased on terahertz human dataset used in deep learning todetect the concealed weapon. The achieved a competitiveaccuracy compared to other concealed weapon detectionsystem, used numerous networks like YOLOv2, Slidingwindow-based CNN,region-based fully convolutionalnetworks (R-FCN), faster region-based CNNS (F-RCNNS)with transfer learning for image classification and detectionproblems. They showed empirically that fine-tuned CNNfeatures give greater performance than conventionalalgorithms. The image dataset used in training the model isbased on

Social Networks by using ML Techniques

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ABSTRACT: This study applies personality prediction of a Twitter user based on the words used in tweets posted by the user. The personality type is predicted based on Big Five Personality Model that outputs agreeableness, conscientiousness, openness, neuroticism, and extraversion as personality traits. We analyzed Turkish words for prediction, prepared a new dictionary that includes Turkish words with their special word groups. The most successful machine learning methods are selected to predict each personality trait. When the machine learning models were trained with the latest 50 tweets of users, models estimated each personality trait with the accuracy values in the range of 0.76 to 0.97.

1. INTRODUCTION

Nowadays, social media is the most popular environment among people. Most of the people use social media to share their emotions, daily life activities, ideas about several events (e.g., political, agenda topics) in the form of photos or texts. Twitter is one of the most widely used microblogging and social

networking services that reflects people's emotions as texts. If somebody is angry, happy or sad about an event, he or she generally prefers sharing these feelings by posting a tweet. It is a tool for people to show a reaction to events. It does not only include texts, but there are also images that reflect the situation. This study only analyzed the text content of tweets. People usually do not think about hiding their personality. It means that they do not act like somebody else. Therefore,it provides us an opportunity for predicting shared texts. This study aims to predict the personality of a user by using an intelligent personality assessment model. A personality model that is called Big Five Personality Model is used for the assessment of the proposed model. In this study, Turkish tweets are collected and preprocessed before applying machine learning models. A new dataset was prepared with the test results and tweets of 51 volunteer Twitter users. Four different machine learning models, which are the most successful ones, are used for classifying five personality traits. To the best of our knowledge, this study is the first research to predict personality traits by using Turkish tweets and machine learning models.

2. RELATED WORKS

There are many researches about personality prediction. Qui et al. applied a personality prediction from microblogs of users [1]. This study had three
folds: (1) personality prediction based on microblogs, (2)detection of linguistic cues related with personality traits, (3) identification of potential linguistic cues that is identified by observers for personality prediction. A total of 28,978 tweets were collected for study. Big five personality traits method was used for prediction. The tool called Linguistic Inquiry and Word Count (LIWC) was used to identify linguistic patterns related with personality traits [2]. Linguistic cues were found for each personality traits. After linguistic cues were determined,eight human experts processed tweets

Robust Localized Secret Sharing for Distributed Blockchain Systems

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Abstract

Blockchain structures save transactionrecords in the shape of a allotted ledgerin which every peer is to keep an samecopy. Blockchain structures resemblerepetition codes, incurring excessivestorage fee. Recently, allotted storage blockchain (DSB) structures were proposed to enhance storage performance through incorporating mystery sharing, non-public key encryption, and recordsdispersal algorithms. However, the DSBresults in massive verbal exchange fee while peer disasters arise due to denial ofcarrier attacks. In this letter, we endorse abrand new DSB method primarily basedtotally on a nearby mystery sharing(LSS) scheme with a hierarchical mystery shape of 1 worldwide mysteryand several nearby secrets. The proposedDSB method with LSS improves thestorage and healing verbal exchangecosts.

Index Terms— Blockchain, mysterysharing, allotted storage.

INTRODUCTION

BLOCKCHAIN structures setup acryptographically steady informationshape to save transaction information inthe shape of a hash chain. Theirdispensed and shared ledgers oftransactions lessen the friction in monetary networks from one-of-a-kindintermediaries the use of one-of-a-kindgeneration infrastructures, or even lessenthe want for intermediaries to validate monetary transactions. Blockchainstructures have created a newsurroundings of commercial enterprisetransactions and self-regulatedcryptocurrencies [1]. However, blockchain works at the premise that each peer shops the whole ledger oftransactions in the shape of a hash chain,despite the fact that they're meaningless to friends that aren't celebration to thetransaction. Consequently, man or woman nodes incur a substantial andever-growing storage value [1]–[3].

Tolessen this storage value of blockchainstructures, a dispensed storageblockchain (DSB) scheme has beenproposed [2], [3]. Inspired through [4], the DSBcombines Shamir's mystery sharingscheme [5], non-public key encryption,and information dispersalalgorithm(IDA) [6]. The DSB reduces the storage to a fragment of the authenticblockchain's load. A disadvantage of theDSB is that it incurs a whole lothigherrecuperation verbal exchangevalue while peer disasters arise to denial of service (DoS) attacks. When aunmarried peer failure occurs, the authentic blockchain structures can getbetter this failure

The Preeminent Role of AI For Enhanced Cyber Security: Novel Perspectives

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Abstract—Cyber security is crucial as society is moving day by day towards a era where online privacy and trust are indispensible. Due to the severity of the damage caused by malicious entities and other type of attackers, the security of cyberspace is need of the hour. In this paper we present novel idea of using AI to provide cyber security. We provide an insight on how design principles from AI can be applied for robust security and the organisations currently using such technology to secure online tasks.

Keywords— Cyber, AI, Machine Learning, Privacy, Security

I. INTRODUCTION

Cyber security includes processes of controlling the system which are designed to protect, technologies, data and networks from cyber attacks. Cyber security helps in reducing the risk of Cyber attacks and protects organisations and personal information from the unauthorised exploitation of system, networks and technologies.

A. CONSEQUENCES OF A CYBER ATTACK

- Impact of cyber attack on business

If any cyber attack is successful on any business organizations, then there will be a major damage to business organizations. Financial, reputational and legal square measure the 3 classes that square measure get impact of a security breach.

- Economic cost of cyber attack

Cyber attacks typically end in in depth loss that square measure arising because of the felony of

Another nice advantage of AI systems in cybersecurity is that they'll unlock a massive quantity of your time for school workers. AI is most typically wont to sight easy threats and attacks. providing the only attacks sometimes have the only solutions, the systems are doubtless be ready to rectify things on its own.

Another way AI systems will assistance is by categorizing attacks supported threat level. whereas there's still a good quantity of labor to be done here (52% of cyber professionals say systems aren't correct enough)[1], once deep machine learning principles square measure incorporated into your systems, they'll truly adapt over time, providing you with a dynamic edge over cyber terrorists. Cybersecurity solutions that place confidence in AI will use existing information to handle new generations of malware and cybersecurity attacks

III. HOW AI IS IMPLEMENTED IN CYBERSECURITY

Machine learning may be a branch of computing (AI). that refers to technologies that alter computers to be told and adapt through expertise. It emulates human psychological feature – i.e. learning supported expertise and patterns, instead of by logical thinking.

Organizations square measure already setting out to use AI to bolster cybersecurity and provide additional protections against subtle hackers. AI helps by automating complicated processes for detective work attacks and reacting to breaches. These applications are getting additional and

Novel Insights Into Cryptovirology : A Comprehensive Study

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Abstract—Cryptography is presently used for defensive purposes. Ciphers are used against passive attackers. Public key algorithms are used against an active attacker in man-in-the-middle attack. Digital signature is used for defending against a forger. E-cash systems are used against a counterfeiter and a double-spender. Pseudorandom bit generators are used against a next-bit predictor. Crypto virology is used for locating failures of protocols and vulnerabilities in design. For defending purpose Forward engineering is used.

I. INTRODUCTION

Cryptovirology is the study of the applications of cryptography to malicious software. It is an inspection on working of modern cryptographic structures that can be used to strengthen, improve, and develop new dangerous malware attacks. The attack of Crypto virology are used for assurance of advancement in privacy and more strong against reverse-engineering, gives the attacker an enhanced anonymity when Communicating with located malware (e.g., over public bulletin boards and Usenet Newsgroups), improve the ability to steal data, improve the ability to carry out extortion, Enable new types of denial-of-service; enable fault-tolerance in distributed crypto viral attacks, and so on. Also, recent work shows how a worm can install a back door on each infected system that opens only when the worm is presented with a system-specific ticket that is generated by the worm's author. This is called an access-for-sale worm [1].

1.1 Cryptovirus

In security of a computer, a virus is defined as a computer virus that contains and uses a public key. Usually the public key belongs to the author of the virus, though there are other possibilities as well. For instance, a virus or worm may generate and use its own Key pair at run-time. Crypto viruses use secret sharing to hide information and communicate by reading posts from public bulletin boards. Cryptotrojans and crypto worms are the same as crypto viruses, but they are Trojan horses and worms. A virus that uses a symmetric key and not a public key is not a Crypto virus (this is particularly relevant in the case of polymorphic   viruses).

There are several rules that all viruses seem to obey.

- By virtue of being programs they all consume CPU time and occupy space.
- Since viruses need to gain control of the program counter in order to execute, they must (directly or indirectly) modify code in the host system in order to do so.
- Their inherent vulnerability to user scrutiny is the last and perhaps most interesting rule of viruses

Viruses can always be frozen and analyzed by the user. They can be backed up (or a backed up copy can be found) and later scrutinized in detail using a low level debugger. In what follows we show that this vulnerability can be effectively bypassed if strong cryptographic techniques are employed and if the virus acts fast enough, i.e. before detection. We also suggest countermeasures and mechanisms to cope with and prevent such attacks[2]. These attacks have implications on how the use of cryptographic tools should be managed and audited in general purpose computing environments, and imply that access to cryptographic tools should be well controlled. The experimental virus demonstrates how cryptographic packages can be condensed into a small space, which may have independent applications (e.g., cryptographic module design in small mobile devices). Hackers have uncovered the dark side of cryptography—that device developed to defeat Trojan horses, viruses, password theft, and other cyber-crime. It's called crypto virology, the art of turning the very methods designed to protect your data into a means of subverting it. In this fascinating,

Sd'X': Principles, Current Trends, Future Directions

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Abstract: A term advocated by IBM for its "software-defined everything" vision. The firm's Software-Defined Environments (SDE) group is the latest development of technology where the Application, Integration and Middleware group works inside the IBM Software group. According to study, IBM declares "a Software-Defined Environment (SDE) optimizes the entire computing infrastructure – compute, storage and network resources – so as to adapt to the type of work required. In modern environment, resources are assigned manually to workloads; that happens automatically in a SDE."By dynamic and strategic assignment of workloads to IT resources based on a variety of factors, including the characteristics of specific applications, the best-available resources, and service-level policies, a software-defined environment can give regular, dynamic optimization and recomposition to address infrastructure issues.

Keywords: Software defined , SDS , SDDC , SDN , SDxI

I. INTRODUCTION

"Software defined" is the current jargon in IT and cloud. Some people loathing it because marketers are bouncing on "software defined" almost as rapid as they bounce on the word "cloud" years ahead they had absolute cloud products. In the current software defined world, no one has a nausea opinion when they attend software defined, but at some level the word "policy" is neurologically associated to blundering, obstinate authority and slow-gripping systems. "SDx" as any substantial item or function that can be executed as or computerized by software. Outside of IT, this encompass apps such as Uber and Airbnb, apps on mobile devices, and Internet of Everything devices such as GoPro cameras,Nest -thermostats, Phantom drones and self-driving cars. Many of the blazing provisions in IT automation today are software-defined networking (SDN), software-defined storage (SDS), and software-defined data center (SDDC). These are part of a immense trend that we efficacy as well call software

II. PRINCIPLES

Software-defined storage (SDS) is a computer schedule that administer data storage assets and functionality and has no

high-speed server hardware with multi-core processors; the general compliance of virtualization in servers, desktops, applications and networking; and the demand of cloud technologies.

The Storage Network Industry Association (SNIA) has made an endeavor to characterize crucial components first characterize software-defined storage (SDS) to encompass:

Standard Interfaces – APIs for the management, provisioning and preservation of storage devices and services
Virtualized Data Path – Block, File and/or Object interfaces that backing applications reported to these interfaces
Scalability– Seamless capability to range the storage infrastructure without interruption to the stated availability or performance
Transparency – The capability for storage customers to auditor and administer their own storage utilization against accessible resources and costs.
An SDN utilization is a software program create to achieve a function in a software-defined networking (SDN) environment. SDN utilizations can restore and enlarge upon functions that are enforce through firmware in the hardware devices of a typical network.

The design fundamentals are as pursue:

Centralized Management-
Large, distributed networking environments lack large manual contact, therefore decreasing adaptability and endanger

Survey of Application Domains of Metamorphic Testing : Novel Perspectives

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Abstract—Metamorphic testing (MT) is a software testing mechanism that tries to solve the test oracle problem. A test oracle is the one which helps a tester to deduce if a program has failed. A test oracle problem arises when it is tedious to find the expected outcomes of selected test cases or to find if the actual outputs agree with the expected outcomes.MT advocates that, if we have one or more test cases in hand and their expected outcomes, one or more follow-up test cases can be developed to verify the essential properties (called "metamorphic relations" or "MRs") of the system or function to be implemented. This paper is a honest attempt to provide an insight of how metamorphic testing can be done in various real time scenarios and the enhanced benefits of deploying this technique to perform effective software testing.

Keywords— Metamorphic testing ,test oracle, test case, bug, defect

I. INTRODUCTION

Software testing is an essential but costly activity applied during software development to detect faults in programs. Testing consists of executing a program with test inputs, and to detect faults there needs to be some procedure by which testers can agree whether the product of the program is correct or not, a so-called test oracle (i.e the tester or an external mechanism can accurately decide whether the output produced by a program is correct or not).

Metamorphic testing is a technique conceived to alleviate the oracle problem. It is based on the idea that often it is simpler to reason about relations between outputs of a program, than it is to fully understand or formalise its input-output behaviour. Metamorphic testing does not only alleviate the oracle problem, but it can also be highly automated.

History Of Metamorphic Testing(Mt)

Since its first publication in 1998, quite number of studies have been conducted on various aspects of MT. In recent years especially, MT has been attracting an increasing amount of attention and has helped detect large number of real-life faults. It was a surprise to the software testing community. an extensive literature review of MT, analysing and summarizing influential studies if either they opened new and important research directions for MT or their results have had significant impact.

For example, some studies presented various approaches to systemically generate metamorphic relations. Other studies proposed the innovative application of MT to, among others, proving, debugging , fault localization, fault tolerance and program repair . Still other studies, have had the surprising and striking results of detecting real-life bugs in, among others, popular compilers and search engines.

II. NEEDS AND BASIC MECHANISM OF METAMORPHIC TESTING

Identity relations are a well-known concept in testing and have been used even before the introduction of metamorphic relations. For example, Blum et al checked whether numerical programs satisfy identity relations such as $P(x) = P(x1) + P(x2)$ for random values of x1 and x2. In the context of fault tolerance, the technique of data diversity runs the program on re-expressed forms of the original input; e.g., $\sin(x) = \sin(a) \times \sin(\pi/2 - b) + \sin(\pi/2-a) \times \sin(b)$ where a+b = x. The concept of metamorphic testing, introduced by Chen in 1998, generalises these ideas from identity relations to any type of relation, such as equalities, inequalities, periodicity properties, convergence constraints, subsumption relationships and many others. In general, a metamorphic relation for a function f is expressed as a relation among a series of function inputs $x_1, x_2, \ldots, x_n$ (with n > 1), and their corresponding output values $f(x_1), f(x_2), \ldots, f(x_n)$. For instance, for the sine example from the introduction the relation between x_1 and x_2 would be $\pi = x_1 = x_2$, and the relation between $f(x_1)$ and $f(x_2)$ would be equality, i.e.: $R = \{(x_1, x_2, \sin x_1, \sin x_2) \mid \pi=x_1 = x_2 \rightarrow \sin x_1 = \sin x_2\}$ This resembles the traditional concept of program invariants, which are properties (for example expressed as assert statements) that hold at certain points in programs . However, the key difference is that an invariant has to hold for every possible program execution, whereas a metamorphic relation is a relation between different executions.

A relation between two executions implicitly defines how, given an existing source test case (x₁), one has to transform

A Comprehensive Survey on Real Time Application of Paxos Algorithm

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Abstract- In a network of unreliable processors ,Paxos protocol provides consensus when failure between communicating entities occur. The Paxos family of protocols contains a variety of trade-offs among the number of processors, number of message delays before learning the agreed value, the activity level of individual participants, number of messages sent, and types of failures. Even though no specific fault-tolerant consensus protocol can ensure progress in an asynchronous network, Paxos provides safety (consistency), and the conditions that could prevent it from making progress are difficult to provoke. Paxos is generally used where durability is required (for instance, to mimic a file or a database), in which the size of durable state could be voluminous. The protocol attempts to make development even during time intervals when some limited number of replicas are unresponsive. There is also a strategy in place for dropping a permanently failed replica or to add a new replica. Our study in this paper brings light on few real time applications of this protocol in current technological era.

Keywords- Autopilot, Chubby, Doozerd, Neo4j, Paxos

I. INTRODUCTION

The architecture defines a peer-to-peer consensus protocol that is based on simple majority rule and which is capable of establishing that one and only one out coming value can be accomplished. Paxos is a group of protocols for solving consensus in a network of dependable processors. Consensus is the process of electing one member among a group of people. State machine replication is an approach for modifying an algorithm into a fault-tolerant, distributed application. It is simple for replicas to execute client commands in the same order and hover in sync if there is only one client or if various clients send their requests in a subsequent order. If various clients send requests to replicas at a time, then different replicas might get these requests in different orders and execute the commands in different orders, causing their provincial states to diverge from one another over time. To

commands will be executed by replicas should be determined. To determine the order we use various subsequent slots.

Replicas attach the requests sent by clients to specific slots, creating a chain of commands but various replicas may end up proposing various commands for the same slot. To avert inconsistency, a consensus protocol chooses a single command from the proposals for every slot. In Paxos the sub-protocol that implements consensus is called the multi-decree Synod protocol, or simply Synod protocol. A replica waits for the decision before actually renovating its chain of commands in the table, executing the next command and figuring out a response to send back to the client that sent the request.

Origin:
Paxos was developed by Leslie Lamport. Paxos has strong resemblance to a protocol used for agreement in viewstamped replication, introduced by Oki and Liskov in 1988, in the context of distributed transactions. The Paxos algorithm for consensus in a information-passing system was first described by Lamport in 1990 in a tech report. Lamport at last published the paper 8 years later in 1998 after it was written in 1990 with the name: "The Part-Time Parliament". But people were not able to understand this paper which made Lamport to write another paper in a simple english with the name: "Paxos Made Simple". Still, the algorithm is not up to the mark to understand easily which made people to start writing papers and lecture notes to explain "Paxos Made Simple." For example "Paxos Made Moderately Complex", "Paxos Made Practical", etc.

EX: How do people agree on something?
  – Question: shall we watch a movie?
  – Input: the answer said by everyone will be either yes/no.
  – Output: yes or no.
  – FLP(Fischer-Lynch-Paterson): this is not possible even with one-faulty process and irrational delays.

The name FLP was given because the output was established by Fischer-Lynch-Paterson. The result shows that there are no

Title

The Vulnerabilities of Rogue Algorithms: Novel Perspectives

Authors

Manas Kumar Yogi

Devi kakarla

Abstract

Given the majority of this current, it's hard to conceptualize oversight for a
notwithstanding when they've turned out badly and are currently damaging indivi
far as that is concerned, not a wide range of damage is unmistakably quantifiab
case. One can make the contention that, what with all the spurious news gliding a
popular government has been damaged. In any case, how would you quantify de
This shouldn't imply that there is no expectation. All things considered, by defi
unlawful algorithms is collapsing upon a real law that we can point to. There i
somebody that ought to be considered responsible for this. The issue still remain
capacity such laws will be implemented.

Key Words

Rogue, AI, Bias, Deep Learning

A Survey of Inducing Fault Tolerance in Software Systems with Stochastic Modelling Approach

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Abstract: As fashionable society depends on the fault-free operation of complicated computing systems, system fault-tolerance has become an important demand. Therefore, we want mechanisms that guarantee correct service in cases wherever system parts fail, be they code or hardware parts. Redundancy patterns area unit usually used, for either redundancy in area or redundancy in time. Wolters book details strategies of redundancy in time that require to be issued at the correct moment. specially, she addresses the alleged "timeout choice problem", i.e., some various fault-tolerance mechanisms like restart, rejuvenation and checkpointing are the question of selecting the correct time. Restart indicates the pure system restart, rejuvenation denotes the restart of the operative atmosphere of a task, and stoping includes saving the system state sporadically. Her presentation includes a quick introduction to the strategies, their elaborated random description, and conjointly aspects of their economical implementation in real-world systems. The book is aimed at researchers and in system plausibleness, random modeling and code dependableness. Readers can realize here an up-to-date summary of the key theoretical results, creating this the sole comprehensive text on random models for restart-related issues.
Keywords: Rejuvenation, restart, stochastic, repair, randomised

I. INTRODUCTION

The Internet might appear as if simply the other network, like the telecom network of recent, cable TV network, satellite communication networks or bank transfer networks. However, once considering the particular usage patterns of the net, Associate with in exciting Nursing world of mathematical interest and curiosity unveil, to that that of networks pale as compared. Caused by the sheer variety of users and net services, still because the elegant elaborateness of the packet-based network technology, measurements of the net have discovered extremely intriguing patterns. These patterns exhibit such phenomena because the little world result, scale free networks and self-similarity, every of that one will realize mentioned extensively in widespread alike. The work rumoured during this book passed off thanks to another attention-grabbing net development, particularly that of the 'heavy tail'. It says that top transfer times are comparatively common, rather more common than with the skinny exponential tail that characterizes completion times in ancient communication networks. This includes a fascinating consequence, that underneath sure assumptions typically tested mathematically: it's often quicker to abort and rehear a transfer try than to attend for it to finish. After all, one might are caught within the serious tail, from that one will solely escape by clicking the reload button. This fascinating reality seduced United States of America into conducting analysis into the optimum temporal order of those retries (or restarts as they're going to be known as during this book). Our analysis result is in a very variety of attention-grabbing theoretical results, amid in depth experimental work (mostly dispensed by Philipp Reinecke). These classes of techniques have in common the matter of timing: however frequent ought to one perform the preventive or pre-emptive activity. Mathematically, this results in a collection of connected issues and solutions, and these type of books provides the reader with a careful data of the assorted mathematical results in they inter-relations.

II. APPLICATIONS

A. Applications of Restart

The term restart applies to job, or task process systems similarly on dealing process systems. all told those employment or dealing is issued and typically completes when a precise time. Completion are often outlined in numerous ways that, just in case of a

A Comprehensive Review Of Web Semantic Technologies In Current World

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Abstract— This paper diligently presents a comprehensive review of applications of web semantic technologies. Web semantics provides the backbone for information exchange among numerous diverse applications which are quite complex in themselves. The objective is to provide a controlled and scalable channel of knowledge transfer over the web .In this review paper we have limited our presentation to only three popular applications of web technology namely in digital libraries, legal domain, telecommunications. Our paper provides insights into few research projects currently taken up as well as challenges faced by researchers working in this field.

Keywords—Digital Libraries, Web Semantics, Ontology, eTOM, SID

I. INTRODUCTION

The comprehensive distribution of digital libraries over the last two decades is hardly remarkable. They offer remote approach to articles, journals and books with many users able to access the same document at the same time. With the use of search engines, they make it feasible to locate specific information more rapidly than ever is possible in physical libraries. Scholars, and others, are able to access rare and precious documents with no threat of damage. However, challenges persist if all the benefits are to be visualized. Interoperability between distinct libraries, or even between distinct collections in the same library, is a problem. At the semantic level, distinct schemas are used by distinct library databases. Search and retrieval need to be made simple, in part by offering each user a consolidated view of the naming of digital objects across libraries. User interfaces need to be enhanced, in particular to face the challenge of large information collections. This paper elucidates the state-of-the art in digital library research, and in particular the application of semantic technology to encounter the challenges imposed. St Succeeding sections go into detail, but it is clear that the challenges defined above regulate closely with the intention of semantic knowledge technology. The ontology mediation techniques are specially motivated by the challenge of interoperability between heterogeneous data sets, and of providing a standard view to those data sets

information approach offers enhanced ways to search for and browse information and, over an understanding of the correlation between documents, to enhance the user interface. Semantic access to information depends in turn on the supporting technologies described in the preceding papers; while the creation and maintenance of ontologies in digital libraries create problems of ontology management which require new insights into ontology engineering. The analysis is illustrated with a particular case study in which semantic knowledge technology is being introduced into the BT digital library. This provides an opportunity not just to trial the feasibility of the technology, but also to gauge the users' reactions and better understand their requirements. Finally, it should be remembered that digital libraries are themselves a particular form of content management application. Much of what is being learned here is relevant in the wider context of intelligent content management.

II. DIGITAL LIBRARIES: THE STATE-OF-THE-ART

Several working digital libraries are academic and make information easily available. Some examples are given in the section below describing digital library research. Others are commercial, such as the ACM digital library (http://portal.acm.org/dl.cfm), which contains material from ACM journals, newsletters and conference proceedings.

Open Issues in Cyber Physical Systems: Strategic Roadmap

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Abstract

Cyber Physical Systems (CPSs) are described by coordinating calculation and physical procedure speculations also, uses of CPSs confront the huge difficulties. The point of this work is to give a comprehension of this developing multidisciplinary issues. To begin with, the highlights of CPSs are depicted, examination advances are condensed from alternate points of view, for example, vitality control, secure transmission and the board, control strategy, framework asset allotment, and model-based progr structure. Over the most recent couple of years, this rising area for CPSs has been pulling in the noteworthy i and will proceed for the years to come. Disregarding quick development, we are still confronting new troul extreme difficulties. In this paper, we briefly survey the current research issues that include vitality control control, display based programming plan transmission and the board, control system, and so on. On this pren coordinate the utilization of more understanding into this systems. At last, the examination difficulties ani recommendations for future work are in a nutshell are laid out.

Keywords: *Cyber-Physical System, Industry 4.0, Health management and prognostics, Time machine*

1. Introduction

Cyber Physical Systems (CPS) are combinations of calculation, organizing, and physical procedures. Instal and systems screen and control the physical procedures, with input circles where physical procedures ir calculations and the other way around. The monetary and societal capability of such frameworks is incon more prominent than what has been acknowledged, and significant ventures are being made worldwide to buil innovation. The innovation expands on the more established (yet at the same time exceptionally youthful) implanted frameworks, PCs and programming inserted in gadgets whose guideline mission isn't calculat example, autos, toys, therapeutic gadgets, and scientific instruments. CPS coordinates the elements of the procedures with those of the product and systems administration, giving deliberations and demonstrating, pl investigation methods for the incorporated whole. As an order, CPS is a building discipline, concentr innovation, with a solid establishment in scientific reflections. The key specialized test is to conjoin reflecti have developed over hundreds of years for displaying physical procedures (differential conditions, st procedures, and so on.) with deliberations that have advanced over decades in software engineering (calculati projects, which give a "procedural epistemology"). The previous reflections center on elements (advance framework state after some time), while the last spotlight on procedures of changing information. S

A Review of Conflict and Co-operational Approaches between Intelligent and Rational Wireless Sensor Networks

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Abstract— wireless sensor networks (WSNs) containing small, control obliged hubs are picking up fame because of their potential for use in a wide assortment of situations like observing   of ecological traits, interruption identification, and different military and regular citizen applications. While the detecting targets of these situations are one of a kind and application-subordinate, a typical execution criteria for remote sensor systems is delaying network lifetime while fulfilling inclusion and network in the sending area. Security is another essential execution parameter in remote sensor systems, where antagonistic and remote situations present different sorts of dangers to dependable system operation. In this paper, we take a gander at the issues of security and vitality effectiveness and extraordinary definitions of these issues dependent on the methodology of amusement hypothesis. The potential applicability of WSNs to interloper location conditions additionally fits diversion theoretic formulation of these situations, where interest avoidance recreations give a significant structure to display location, following and observation applications. The appropriateness of utilizing amusement hypothesis to examine security and vitality productivity issues furthermore, interest avoidance situations utilizing WSNs originates from the idea of key communications between hubs. Methodologies from amusement hypothesis can be utilized to upgrade hub level too as system wide execution by abusing the circulated basic leadership capacities of WSNs. The utilization of amusement hypothesis has multiplied, with a wide scope of uses in wireless sensor organizing. In the wake of this expansion, we overview the utilization of diversion theoretic ways to deal with detail issues identified with security and vitality productivity in remote sensor systems.

Keywords— conflict, co-operational, intelligent, rational, wireless

I.   INTRODUCTION

A wireless sensor network (WSN) is a wireless network comprising of spatially conveyed self-sufficient gadgets utilizing sensors to screen physical or natural conditions. A WSN framework consolidates an entryway that gives wireless network back to the wired world and conveyed hubs. The wireless protocol you select relies upon your application prerequisites. A portion of the accessible guidelines incorporate 2.4 GHz radios dependent on either IEEE 802.15.4 or IEEE 802.11 (Wi-Fi) principles or exclusive radios, which are generally 900 MHz.WSN made applications for territories including medicinal services, utilities, and remote checking. In health care sector, wireless gadgets make less obtrusive patient observing and social insurance. For utilities, for example, the power matrix, streetlights, and water municipals, wireless sensors offer a lower-cost strategy for gathering framework health care information to lessen vitality use and better oversee resources. Remote observing applications like Environmental checking of air, water, and soil, Structural checking for structures and extensions, Industrial machine checking, Process checking, Asset following permit no wiring expense and make utilization of various estimation applications.

The asset obliged nature of WSNs as far as their size, cost, weight and lifetime is an essential zone of worry for most potential applications utilizing WSNs. Getting it done, the limitations of size, weight and cost of individual hubs have pushed their utilization in a wide assortment of military and non-military personnel applications. Even from a pessimistic standpoint, limitation of the power-restricted nature of hubs which likewise obliges their computational, correspondence and detecting capacities calls for investigation into advancing exchange offs among unwavering quality and drawn out network task. Combined with the natural lack of quality of the wireless channel, conceivable threatening condition in certain application-particular arrangement districts and gadget inconsistency of individual hubs, WSNs are liable to one of a kind difficulties for proficient power administration to delay network lifetime notwithstanding satisfying detecting goals of the application.

Vitality proficiency and accomplishing unwavering quality of information accumulation is a key issue in sensor systems. Vitality effectiveness has been explored broadly and the different ways to deal with accomplish a vitality proficient system incorporate booking sensor hubs to switch back and forth between vitality moderating methods of activity, productive directing calculations, bunching, joining insight and utilization of spatial restriction at each sensor hub to lessen transmission of excess

A Propulsive Roadmap for IoT Beyond 2025

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-----------------------------------ABSTRACT-----------------------------------
IoT is a worldwide-recognized trend that is gaining popularity incredibly fast. The baseline lies in the fact that IoT has already transformed a number of industries and took them to the new level, and these industries include healthcare, finances and much more. No wonder there is such a hype about it .There are tremendous new opportunities with IoT flowing out every couple of months so we highly recommend   all to keep an eye on this technology. In this paper will have shed light on the inherent concepts which will affect the working of IoT beyond 2025.We have discussed key points in this paper regarding the operational components of an IoT System where improvements can be done by researchers so as to leverage the usage of IoT environment.
Keywords - IoT, Nano, Sensors, Cognitive, network, RFID.

I. INTRODUCTION

The Internet of Things may be a captivating issue in the business anyway it is definitely not another thought. In the mid 2000's, Kevin Ashton was laying the arrangement for what may transform into the Internet of Things (IoT) at MIT's AutoID lab. Ashton was one of the pioneers who envisioned this idea as he examined for ways that Delegate and Gamble could improve its business by interfacing RFID information to the Internet. The thought was essential yet competent. If all things in step by step life were furnished with identifiers and remote accessibility, these things could be talk with each other and be regulated by PCs.

The term Internet of Things (IOT) has been around for a long time. In this circumstance, it is gaining ground with the improvement of front line remote development. The principal thought of this thought is the closeness of an arrangement of articles –, for instance, RFID, NFC, sensors, actuators, mobile phones. In this IOT development the RFID is the most basic thought and it is essential for web of things. Unmistakable developments in publicize like RFID, machine to machine correspondence, vehicle to vehicle correspondence molecule etc. are actualized using IOT[8]. The basic issue of IOT is going up against circumstance of security the potential Hackers who always on edge to strike. The ability to code and track objects has empowered associations to end up more powerful, quicken shapes, lessen bumble, keep away from robbery, and join mind boggling and adaptable legitimate systems through IOT.

The "Internet of Things" alludes to the coding and systems administration of ordinary items and things to render them the present time, the nonappearance of interoperability is baffling expansive utilize. An average tongue could be an answer and the contraptions itself need to wind up more watchful. A characteristic living being passes on in each cell the aggregate genotype with solitary "working rules". This could be a perspective for the Internet of Things.

Today, all the different devices with their individual limits inside the Internet of Things give by methods for their own, prohibitive procedures. Honestly, there are presently an extensive variety of genuine standards, it's essentially that these restrictive occur inside each individual industry.

If you have to relate the particular regions and devices with each other, a foundation quickly ends up being astoundingly awesome.

A focal control unit makes IoT environments susceptible: The normal "connector" to date is by methods for a principle issue. Sensors assemble data and send these to a gateway or cloud server. Starting there the data is deciphered and actuators controlled suitably. In the field of building robotization, this can frequently be things like warming controls, light switches, modernized entryway or shade controls[9]. In solitude nevertheless, without the central section or cloud game plan, most of the sensors and actuators are all around defenseless. Just by virtue of learning inside that central control unit they can fulfill their work and team up with each other.

II. INTERNET OF THINGS ARCHITECTURE AND TECHNOLOGY

A. Cognitive Architectures:
Cognitive computing

A Investigative Study of Software Rejuvenation Techniques: Principles, Challenges, Future Directions

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Abstract— Programming revival is the idea of smoothly ending an application and promptly restarting it at a clean inside state. In a customer server kind of use where the server is proposed to run ceaselessly to give a support of its customers, restoring the server procedure intermittently amid the most sit without moving time of the server builds the accessibility of that service. In a long-running calculation escalated application, reviving the application occasionally and restarting it at a past checkpoint improves the probability of effectively finishing the application execution. We present a model for dissecting programming revival in such persistently running applications and express downtime and expenses because of downtime amid rejuvenation regarding the parameters in that model. Based on the exploration discoveries we present exhaustive rules to help basic leadership amid the outline of restoration planning calculations, and also in choosing the proper revival system.

Keywords— Rejuvenation, Checkpoint, Fault Tolerant, Software Aging, Self Repair

I. INTRODUCTION

Software undergoes functional degradation due to many reasons which are discussed in this paper. The coining of term software aging led to the robust explanation of the mechanism of incremental degradation of the software under use which could result into system crashes or undesirable hang ups. Multiple reasons exist like the depletion of systems resources, such as memory-leaks, unreleased locks, non-terminated threads, shared-memory pool latching, storage fragmentation, data corruption and accumulation of numerical errors. The aging property is quite inherent in any type of software with considerable amount of complexity, but it is particularly troublesome in long-running applications. It is a issue not limited to desktop operating systems but also mobile operating systems. The present situation for software systems is appreciably ascending in functional complexity with the advent of Web-Technologies, the use of complex middleware for commercial application integration. As a result, there are deep concerns with this concept of software aging, and it is quite necessary to develop few techniques to face this challenge so as to enhance the dependability of autonomic abilities of highly complicated IT systems.

were proposed or adopted to counteract software aging. The most of SAR papers are focused on determining the optimal schedule to perform rejuvenation, by either analytical models (i.e., time-based rejuvenation), or by measurements (i.e., prediction-based rejuvenation). In this section, the attention is focused on techniques adopted to rejuvenate the system. Rejuvenation aims to bring the software from a failure-prone state (which is the result of errors accumulated due to software aging) to an aging-free state. Therefore, rejuvenation techniques can be compared with respect to how the state is processed and the resulting aging-free state that is achieved after rejuvenation. We distinguish between Application-generic actions, Application-specific actions, and Unspecified. Application generic actions are further classified in: Component Restart, Application Restart, VM/VMM (Virtual Machine, or Virtual Machine Monitor) Restart, Node Reboot, Cluster Failover. These actions are generic since they do not make use of application-specific features, but rely on restarting the system or its components to perform software rejuvenation, or they activate another copy of the system. By following this approach, the system or the component being rejuvenated is brought to its initial state, which is assured to be aging-free. This kind of rejuvenation is simple to implement since it makes use of initialization mechanisms of the system, and for this reason it is the most widespread. By contrast, application-specific rejuvenation is tailored for a specific system: it aims at reducing the cost required to perform rejuvenation (i.e., the downtime and performance loss due to rejuvenation), by cleaning a specific aging-affected resource.

This kind of rejuvenation introduces additional mechanisms in the system, and developers exploit peculiar features of the system or the resource. Some examples of application-specific rejuvenation are represented by garbage collection, kernel table flushing, defragmentation. State checkpointing mechanisms could also be adopted, although they need to be tailored to the specific application in order to save only the relevant part of the system state and avoid to include aging-related errors in the checkpoint. These techniques are effective at reducing the cost of rejuvenation since they do not bring the

Green IOT: Principles, Current Trends, Future Directions

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Abstract

The two trending and popular technologies are Cloud Computing (CC) and the Internet of Things (IoT) are current hot discussions in the field of agriculture and healthcare applications. Motivated by achieving a sustainable world, this paper discusses various technologies and issues regarding green cloud computing and green Internet of Things, further improves the discussion with the reduction in energy consumption of the two techniques (CC and IoT) combination in agriculture and healthcare systems. The history and concept of the hot green information and communications technologies (ICT's) which are enabling green IoT will be discussed. Green computing introduction first and later focuses on the recent works done regarding the emerging technologies. Finally, lists out the advantages, challenges, and future research directions related to green application design. Our research aims to make green area broad and contribution to sustainable application world.

1. Introduction to Green IoT

Security in IoT is a nightmare in spite of its good use on a large-scale. Generally, IoT is a combination of three main technologies.

* Information Technology
* Operations Technology
* Consumer Technology

Internet of Things is a network of electronics, home appliances, vehicles, entrenched with electronics, software, sensors, actuators and network connectivity, which enables these objects to connect and exchange data. Each thing is uniquely identified using its built-in address, and is able to inter-operate within the exiting internet infrastructure.

Smart world is beholding as an era in which objects can automatically and intelligently serve people in a collectible manner. Internet of Things (IoT) connectseverything in the smart world. Particularly, an overview regarding IoT and green IoT is performed first. Then, the hot green information and communications technologies (ICTs) enabling green IoTare studied, and general green ICT principles are epitomized. Furthermore, the latest developments and future vision about sensor cloud, which is a novel paradigm in green IoT, are reviewed and introduced, respectively. Our work targets to be an enlightening and latest guidance for research with respect to green IoT and smart world.

IoT ELEMENTS In this section we have listed and discussed on some key elements for IoT and IoT based applications. If we classify IoT elements/components into few basic categories that aids seamless connectivity then it can be as followed: (i) Hardware (ii) Middleware (iii) User End Visualization actuators, embedded devices and other communication

Hardware constitutes of various sensors, actuators, embedded devices and other communication devices. Middleware constitutes of various tools used for on demand storage of data collected by sensor devices and processed by embedded devices and various computing tools used for data analytics.User End Visualization consists of various data visualization and interpretation tools which can be accessed on various diverse platforms which aids the enduser to keep a track of various events driven by those data collected by various sensory hardware. We have highlighted few breakthrough and enabling technologies in the above mentioned categories which will provide a clear conscience for the three components listed in figure 1.

2. Applications of Green IoT

The Green IoT which makes the smart devices to communicate with real world and which focuses on saving of energy and pollution.

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Fig.1: Overview of Green IoT

The numerous applications of Green IoT are as follows:

A. Smart Home: A G-IoT enables home equipped withlighting, heating, and electronic devices that can be controlled remotely by using smartphone or computer. It can be equipped with Waste removal, Ultrasonic showers, Beds that make/change sheets themselves, Lighting creates artificial sunrise, Computer suggests clothing based on your taste, weather, Windows and walls will allow adjustable amounts of sunlight, warmth or cold in, Electronic soundproof rooms and windows. Soundproof energy fields that you can walk through, Hidden computers, sensors, microphones and electronics throughout the house. Central computer accepts voice commands, distinguishes between occupants for personalized responses and actions, Television, computer and phone merge into one device etc.

B. Industrial Automation: Industries have beenautomated with machines that allow for fully automated tasks without or with little manual intervention. An internet based industry automation system that allows a single industry operator to control industry appliances.

C. Smart Healthcare:IoT is to refashion Healthcareindustry by bringing up new and advanced sensors which are connected with Internet producing essential data on real-time. It helps in achieving three key, outcomes of any efficient health care services-improved access to care, increased care quality, reduced care costs.

D. Smart Grid: Much like the Internet of Things, asmart grid is about balance. It is about efficiency. It is about dynamically adjusting and re-adjusting to optimally deliver energy at the

A Review of Robust Techniques for Enhancing Anonymity in Delay and Disruption Tolerant Network

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Abstract—**Research on Delay and Disruption Tolerant Networks (DTNs) challenges the normal assumption of end-to end property, extending networked communication to e.g. intermittently connected devices, ad-hoc mobile environments, first-responder disaster situations, etc. In such environments, making certain the safety and privacy of each content, networks, and participants is commonly important. during this work, we have a tendency to think about DTN namelessness and privacy. The disconnected nature of DTNs presents a novel issue for ancient namelessness approaches, particularly restricted data of different nodes and methods within the dynamic, mobile network. we have a tendency to develop a selected answer, the brink Pivot theme (TPS), to supply namelessness and sender-receiver unlinkability in DTNs. Our scheme, supported secret sharing primitives, permits a user-selectable level of namelessness, a crucial feature for DTN environments that has to balance security and value. Through simulation and analytical analysis, we have a tendency to measure the performance and overhead of TPS and notice that it addresses the constraints of DTNs whereas providing a appropriately high-level of namelessness.**

Keywords-DTN,Delay,key, communication,Anonymity

I. INTRODUCTION

Modern network communication typically assumes immediate and reliable end-to-end property. This assumption is true in environments cherish the web, however, there's an oversized category of networks, questionable challenged networks, wherever it doesn't hold. samples of such networks embrace media, sensor, and satellite networks, and mobile, vehicular, first-responder, and military ad-hoc networks. These networks area unit characterized by restricted resources, intermittent property, and probably long delays and low information rates. Interest in these challenged environments has burning analysis in Delay and Disruption Tolerant Network (DTN) architectures. DTNs facilitate intelligent store-and-forward behavior to produce ultimate information delivery once a contemporaneous end-to-end path doesn't exist within the network. style and development of DTN protocols is presently ongoing. whereas developing operational systems and demonstrating practicableness has been a primary goal of DTN analysis, the protection of DTNs is setting out to receive attention. The foundations for basic security are made public, as well as information origin authentication, integrity, and confidentiality primitives. However, DTNs gift new and distinctive security challenges as a results of restricted

resources and lack of end-to-end property. Farrell et al. argue that key management, traffic analysis, policy social control,

and node introduction area unit the core challenges in DTNs; we have a tendency to argue for adding namelessness to the present list.

We logically divide DTN namelessness into 2 classes, identity and placement. Identity namelessness implies that the identity of a traffic supply is hidden to all or any different nodes, as well as the traffic recipient. Location namelessness considerations the invention of, or advancement in, data of geographic location from info leaked in messages.

Many examples are advanced in literature and follow wherever namelessness is efficacious, and sometimes valuable. Some examples include: on-line journaling and blogging for individuals visiting, working, or living during a country that censors or blocks traffic, enforcement operations involving observance criminal activity during which success depends on hiding, and human rights employees or "whistleblowers" United Nations agency may otherwise resist speaking get in concern of physical attacks or threats from those with opposing viewpoints or motives. namelessness prevents these forms of actions from being connected to AN identity on a network. Existing DTN applications that fall under the higher than usage eventualities and demand for namelessness embrace blogging, internet serving and water sport, electronic message, and interactive voice electronic

Enhancing Ability of User Personalization by Application of Rough Fuzzy Grouping Mechanism for Improved Web Intelligence

Manas Kumar Yogi, L. Yamuna

Abstract: In contemporary world, Web personalization tenders accurate means for the evolution of operations that have the enticing feature to satisfy compelling obligation of their end user. To perform that, developers of web need to face an decisive trial regarding the disclosure of information of concern which the end users show while they reach out to various sites. Web Usage Mining is a functioning exploration region which regards the disclosure of helpful examples of run of the mill client practices by using utilization information. Grouping has been hugely applied for sake of classifying users having identical concerns. Rough fuzzy grouping proves to be an mechanism handy to deduce user sections from web use information accessible via server history files. It is well known that fuzzy grouping works on mechanism of distance-based metrics to judge the similarity among user choices. But the application of such techniques may propel to feeble outcomes by classifying user groups that do not include the meaningful knowledge assimilated . In this paper, we advocate an technique based on a rough fuzzy grouping algorithm armed with a rough fuzzy similarity metric to deduce user groups. For pertinence, we deploy the presented technique on users data extricated from server history files of a popular web site.

Keywords: rough ,fuzzy, similarity measures, grouping, personalization, user categorization.

I. INTRODUCTION

The developing dispersion of Internet as another medium of data scattering and the expanded number of clients that every day peruse the system have driven an ever increasing number of associations to open their data and to give their administrations on the Web. Be that as it may, the hazardous development in the utilization and the extent of web has expanded the troubles in dealing with these data and has started a developing enthusiasm for the improvement of customized applications, i.e. applications ready to adjust their substance or administrations to the client interests. Today ,web personalization speaks to a standout amongst the most intense apparatuses for the change of applications by permitting to give substance customized to the requirements of clients, fulfilling thusly their real wants without requesting them. Subsequently, one of the primary difficulties that applications on the web need to confront comprises in understanding client inclinations and interests with a specific

end goal to give customized capacities that interest to t clients. Therefore, information disclosure about clie intrigues uncovers to be a critical action in the gener procedure of personalization.

Specifically, such action is gone for the distinguishi proof of client personal conduct standards, i.e. the revelati of basic practices shown by gatherings of clients amid th visits to web locales. Cutting edge innovations, for examp those originating from information mining and mining of t web may offer substantial apparatuses to achieve this poi Mining of the web [1], is an essential branch that is given the revelation of fascinating examples in the client perusi conduct through the examination of Web utilizati information portraying the co-operations of clients wi locales. Since get to server history documents store immense measure of information about client get to desig they speak to the most essential wellspring of utilizati information. Obviously, if legitimately misused, serv history records can uncover helpful data about the perusi conduct of clients in a site. As an outcome, these informati can be utilized to infer classifications of clients catchi normal interests and patterns among clients getting to the si The found client classes can be misused to conv customized capacities to right now associated clien Without any from the earlier information, unsupervised ord or grouping is by all accounts the most encouraging path f learning client personal conduct standards and distinguishi client classifications by gathering together clients wi normal perusing conduct [2], [3]. In the decision of compelling grouping technique for WUM, a few componen must be considered. Early research endeavors have depend on grouping methods that regularly uncovered to insufficient to manage the clamor normally introduce in W use information. In this specific situation, alluring metho ought to have the capacity to deal with the vulnerability a dubiousness basic information about the co-operations clients with the locales. Another vital viewpoint to considered is the likelihood to get covering clusters, with t goal that a client can have a place with in excess of o gathering. In actuality, the perusing conduct of clients exceptionally dubious and unclear in nature. A website is and large visited by a colossal count of clients owning assortment of necessities. In addition, a client may get t similar document of a site for various needs and includes few objectives at whatever point they visit a site. Su

Application of Modified Memetic Algorithm to Uncover Authorship Styles in Software Forensics

Y. Manas Kumar, L.Yamuna, S.R.Y .Himatej

Abstract: Our paper sincerely advocates a memetic algorithm to uncover authorship styles. For software forensics experts our proposed mechanism will greatly reduce the time, effort whenever a malicious job is done to break into a software system. We have considered three factors, namely the variable naming convention, usage of comment styles. We have considered three factors, namely the variable naming convention, usage of comment styles, usage of data structures. We observe that these 3 factors can greatly help to uncover authorship style of a pro-grammer thus saving us from further damage in this technologically dependant society.

Keywords: Software forensics, Memetic, Authorship, nearness value, genetic.

I. INTRODUCTION

Adversaries in software industry exists in forms which are quite difficult to analyses software forensics is counted up as one of them .the most popular software threats are viruses, logic bombs, Trojans worms which leave the functionality of a software as a regret after their attack is completed damage detection happens only after the adversaries finish their task intrusion detection engineers face this uphill challenge of reporting the damage done to the software researchers have found that 70% of adversaries who crack the software leave behind some code in software forensics field this leftover traces of code are analyzed to get an insight of the nature of the programmer. Multiple factors effect a person's programming style, so to establish an authorship style is not easy as said. In this paper we will look into the factors through which we can obtain styles of coders. The main issue is lack of robust formal methods (or) tools to meet this challenge ,no method of discouraging anonymity in software system is full proof given contexts which change with respect time .Talking of remnants of an attack viruses generally deposit their code in source files, object code executable code .In software forensics domain, this code acts as evidence which is used to verify source of the attack .this corresponds to how legal officials work with handwriting analysis to identify suspects who may be involved in such crimes.

in programming languages few languages heavily use Data types control structures in innovative way which gives scope for authors to develop their unique styles while developing software. While development reuse debugging of code usage of certain stylistic elements help a lot. Also, the gravity of this challenge increases when two (or) more authors collaborate to develop a single module of a software. In such cases the authorship styles are mixed and tracing individual authorship is impossible. to start the process of identification samples of

code are kept for observation if samples of code amount significantly then statistical methods can be easily applied to find authorship of the code but our immediate issue is that code after compilation (or) optimization may not look exactly same as the original source code .so, reverse engineering such codes may induce considerable amount of ambiguity which effects analysis at further stages. Other feature which has to be seriously looked into is choice of data structures and algorithm. beginners would not prefer advanced data structure with which they are comfortable .in same sense choice of algorithms also rests with authors based on their competence level complex algorithm, even if they are time saving is not picked up by large number of coders for obvious reasons, the next feature in contention for authorship analysis is usage of error handling methods. it has been found by practitioners that seldom such codes occur in case they occur, it is due to developmental policies enforced by team managers which is part of routine error checking individual authors mostly neglect exception handling routines in their code. The next feature is choice of system calls while providing support to code .this scenario mostly occurs in UNIX like environment. For instance index, strchr methods are part of two different versions of UNIX each author gets habituated only to usage of the same method while coding the last feature but definitely the most importance one we consider in this paper is nature of errors made by authors. some authors make same kind of errors consistently for example off by one error in loops for arrays or while referencing dereferencing pointers after proper comparison

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Mob Programming: Principles, Trends, Challenges

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Abstract- *Mob programming is a practice where the researchers pool all the brilliant people, working on the same thing, at the same time, in the same space, and at the same computer." the researchers can think of it as taking pair programming and scaling it up to 10,specially if the researchers can get a cross-functional team involved in the process. Basically, the concern is that mobbing is not productive. People ask, "How did you get your manager to buy into it?" as if there the researchersre some trick involved because obviously it can't be an efficient use of developer time. If the researchers have two developers, the researchers should put them on separate tasks to get twice as much done, right? The problem with that line of thinking is that the researchers tend to imagine that everything will go smoothly. The researchers forget how much time the researchers spend on things like communication, integration, and testing. The researchers forget that software development has a strongly creative aspect that is unpredictable. And the researchers forget that things will take a different amount of time depending on who is working on it. Mob programming naturally favours the Lean concept of flow efficiency rather than resource efficiency. So if the researchers value getting things done and delivered to our customers, then yes, mobbing is very productive.*

keywords- Mob, pair, agile, team, development

1. INTRODUCTION

Mob Programming represents a development strategy for software where the complete team works on the same thing, at the same time, in the same space, and at the same computer system. This simulates to pair programming, where two engineers work at the same workstation and collaborate on the same code at the same time, whereas with Mob Programming the full team puts effort together on releasing a single deliverable item at a time, deliberately collaborating and loading code at the same computer. In additive to software coding, the team works together to do almost all the work a emblematic software development team implements, such as designate stories, designing, testing, deploying software, and working with the customer (in our environment the researchers call our internal customers our "Participants", which is similar in nature to a Product holder). Almost all work is handled as "working meetings" or workshops, and all the people involved in creating the software are considered to be team members, including our Participants. The researchers work this way more or less all day long, every day. In other words, this is an transformative step beyond the Extreme Programming concept of pair programming. The researchers seek to emphasize and magnify concepts such as end to end and peer to peer communication, team alignment, collaboration, whole team involvement, continuous code review, and the self   organizing team", to name a few. In this experience report I describe why the researchers work this way, our basic setup, some of the benefits the researchers have seen from Mob Programming, and how the researchers work this way including a few critical practices, such as the "Driver/Navigators" teamwork model that the researchers have adopted that makes it possible for us to

Repressing Superfluity in Wireless Sensor Network Traffic by Application of Kalman Filtering Technique

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Abstract: Repetition concealment is a system traffic pressure method that, by reserving repeating transmission substance at accepting hubs, maintains a strategic distance from more than once sending copy information. Existing executions require bounteous memory both to investigate ongoing traffic for superfluity and to keep up the reserve. Remote sensor hubs in the meantime can't give such assets because of equipment imperatives. The decent variety of conventions and routing designs in wireless sensor networks organizes besides builds the density of signal propagation and extents of excess in traffic capricious. The regular routine with regards to narrowing down pursuit parameters in view of qualities of delegate parcel follows while analyzing information for repetition along these lines winds up unseemly. These inherent challenges influenced to construct a different convention that leads a probabilistic influx examination to recognize and store just the batch of repetitive exchanges that results most density of traffic reserve funds. We observed this way to deal with an answer based on thorough examination and without limits reservations to be practicable.

Index Terms: fingerprint, Superfluity, rehashing, cut points

I. . INTRODUCTION

Superfluous information exchanges squander arrange assets and have for some time been liable to thinks about on the best way to stay away from them. Normally utilized arrangements incorporate storing the responses to visit information demands [1], or applying mass pressure to reduced information before sending [2]. Superfluity Repressing is one specific technique that averts rehashed exchanges of indistinguishable information over system joins. The fundamental thought is to keep certain approaching information in memory at the getting hub. In the event that another trans-mission of similar information wound up essential from that point, it tends to be reproduced locally from the recently stored information as opposed to having it sent once more. This thought was first acknowledged by Santos et al. [3] in an exceptionally straightforward structure. Their answer tracked late friendly parcels at the sending hub by figuring a solitary hash an incentive over every bundle's payload substance and checking rehashed hash events. Over a specific tally limit, it

The hub on the less than desirable end similarly followed repeating payloads and put away in a reserve table the approaching information surpassing the edge. It would then have the capacity to supplant along these lines accessing by their comparing information from neighborhood memory. This precedent delineates the key plan parts of a Superfluity Repressing convention. In the first place, traffic should be logged for examination with the goal that excess parts can be identified. Besides, the sending and accepting hubs both need to concede to an arrangement which excess information to store and how the reference to such duplicate information is conveyed. Ongoing distributions [4,5,6,7,8] have concentrated on the issue of how to recognize indistinguishable information sub substance between subjective information sets– rather than simply coordinating total bundle payloads – utilizing different finger printing [9] and piecing [6] strategies. The corresponding work – talked about more completely in Sect. 4 – is anyway gone for improving convention execution for rapid systems and does not fit the necessities of remote sensor systems. The utilization of Superfluity repressing in remote sensor systems has not yet been researched as of right now. It is effectively persuaded as lessening the measure of information exchanges over the system spares transmission vitality, a fundamental asset of battery driven sensor hubs. Moreover, Superfluity repressing is generally integral to existing traffic sparing strategies and accomplishes traffic decrease autonomously of the numerous sensor arrange conventions as of now being used. our paper represents observational models for the above focuses in Sect. 2.In this paper we present a Superfluity repressing convention that we conceived with the points of interest of remote sensor arranges as a main priority. Our paper develops mechanisms which investigates traffic without assumptions on the highlights of superfluity like its recurrence or granularity of event. It doesn't restrain the pursuit space of the information investigation like existing arrangements do, making it relevant for erratic and subjective traffic substance. In the meantime, our convention is equipped towards finding just those covers in information that yields most investment funds when stifled. It reserves the best and

Web Software Engineering: Principles, Trends, Future Challenges

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Abstract- Inside a brief period, the Internet and World Wide Web have turned out to be universal, outperforming all other mechanical improvements in our history. They've likewise developed quickly in their extension and degree of utilization, altogether influencing all parts of our lives. Businesses, for example, assembling, travel and cordiality, banking, instruction, and government are Web-empowered to improve and upgrade their activities. Web based business has extended rapidly, cutting crosswise over national limits. Indeed, even conventional inheritance data and database frameworks have moved to the Web. Advances in remote innovations and Web-empowered machines are setting off another rush of versatile Web applications. Accordingly, we progressively rely upon a scope of Web applications. Since a significant number of us depend on Web based frameworks and applications, they should be solid and perform well. To manufacture these frameworks and applications, Web designers need a sound system, a trained and repeatable procedure, better improvement instruments, and a lot of good rules. The rising field of Web building satisfies these necessities. It utilizes logical, designing, and the board standards and methodical ways to deal with effectively create, send, and keep up excellent Web frameworks and applications. It intends to acquire the present turmoil Web based framework advancement leveled out, limit dangers, and upgrade Web webpage viability and quality.

Index Terms-Web, Software Engineering, Personalization, Retrieval, Efficiency

1. INTRODUCTION

The development of the Internet, Intranets, Extranets, and the World Wide Web has just significantly affected business, trade, industry, saving money and back, training, government and amusement areas, and our individual and working life. Numerous heritage data and database frameworks are being moved to the Internet and the Web situations. Electronic business through the Internet is quickly developing, cutting crosswise over national limits. An extensive variety of new, complex appropriated applications is rising in the Web condition. The prevalence and omnipresence originates from the idea of the Web itself and its highlights: it gives a data portrayal that backings interlinking of a wide range of substance, simple access for end clients, and simple substance creation utilizing generally accessible devices. In any case, by and large, the improvement approach utilized for Web-based frameworks has been impromptu, and Web-based frameworks have been continued going through a persistent stream of patches. Generally

Without restrained process for creating Web-based frameworks, we may confront difficult issues in their fruitful advancement, sending, activity of and 'upkeep.' Poorly created Web-based applications that are mushrooming now have a high likelihood of disappointment. More awful, as Web-based frameworks develop more intricate, a disappointment in one can and will proliferate expansive based issues crosswise over many. At the point when this occurs, trust in the Web might be shaken hopelessly, causing a Web emergency. The potential Web emergency could be more genuine and across the board than the product emergency, which the product designers have been facing. In request to maintain a strategic distance from a conceivable Web emergency and make more prominent progress being developed and uses of complex Web-based frameworks, there is a squeezing requirement for trained methodologies and new strategies and devices for advancement, arrangement and assessment of Web-based frameworks. Critically, such methodologies and systems must consider 1) the

AUTOMATIC CONTROL SYSTEM FOR ROBOTIC CAR USING INTERNET OF THINGS

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ABSTRACT - In this paper, we presents compact portable robot with Arduino NodeMCU as central driving functional unit with novel features of wireless control using Wifi module with the activation and deactivation of obstacle detection in the path of the robot .The main contribution of the paper is that it leverages the efficiency of robot's motion controlling system .These innovative technologies have potentials to build a board less communication society a symbolic society between humans and robots. The GPS system is incorporated, hence the client can trace the car. Commands and data are stored in cloud services which delivers to device when it is ready to receive. The system has IR obstacle sensors for avoiding obstacles coming in its path. We present the architecture and design of arduino communication and how to control the car by means of commands and application.

Keywords: Arduino NodeMCU, Motor driver, IR obstacle sensors, IoT.

1. INTRODUCTION

Arduino is designed as an open-source electronics prototyping platform providing schematics and flexible development kits for enthusiastic users who intend to produce interactive objects or environments. Arduino can be used to sense surroundings by utilising various transducers to read and interpret inputs in order to make responses for example through the controlling of motors or transferring of data. In today's world there is a significant development in the field of robotic control. Mobile robotic

vehicles are light, small and portable enough to be carried by an individual[5]. Our design serves as a solution to demonstrate how the control of the dc geared motors in coordination of the signals obtained from Wi-Fi module in conjunction of Arduino is used to achieve high degree of precise path control from the user side to achieve standard operations like moving at a particular target location, collecting data and avoiding any obstacle to prevent collision .In existing literature many works have been done on the implementation and analysis of

Brain to Brain Communication: A Study on Technology

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Abstract : This is the very newest technology where machine can understand the feelings of human being and If you are unable to see, talk, listen and till do you want to communicate? no problem, HIBA will be there wi about the new technology , which will be implemented in the future. Hybrid Intelligence Biometric Avatar(H the feelings of any person and even become the part of their fabric. We can say that 'speech' communication 'thought' communication in future.

IndexTerms-HIBA;ThoughtCommunication; Machine Intelligence;

I. INTRODUCTION

Imagine what happens to the "black hole theory" if Stephen hawking was unable to see? Advance technology a have almost wiped-out the word impossible from the dictionary. Can you imagine to be in a world where you c communicate with one another and your brains doing all the talking? Well, an expert says that by 2050, huma by using their thoughts..

2.HYBRID INTELLIGENCE:

2.1.WHAT IS HYBRID INTELLIGENCE?

When machines and human work together, it is known as hybrid intelligence. It is the intelligence that may intelligence as part of the research going in a direction in such a way.

2.2USING ARTIFICIAL INTELLIGENCE

This will be possible through a collective AI consciousness which will understand the feelings of people conn information with them, taken on their persons, and even become a part of the fabric of their brains. In world Dubai, Mark Karjnovic revealed the ideas at the museum of the future as part of the world government sum reported. Karjnovic the producer of the exhibit explained: it is very similar to the work of Elon Musk- it is an for humanity.

HIBA will have the ability to connect the minds of the most clever of us, combining those minds with every practically and put it all together in hybrid intelligence.

Translation and Transliteration of words

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Abstract— Translation is one of the oldest large-scale applications of computer science. Machine Translation is the application of computers to the translation of texts from one natural language into another natural language. Machine language is included in the wide domain of Natural Language Processing(NLP), the field of learning concerning with the study and development of computer systems for processing natural (human) languages. The need for MT continues to increase in today's networked world, the need for systems to help humans read documents written in a variety of languages is constantly growing. The ideal aim of machine translation systems is to produce the best possible translation without human assistance. Basically every machine translation system requires programs for translation and automated dictionaries and grammars to support translation.

Keywords— NLP, Translation, Dictionaries, Transliteration, Unicode

I. INTRODUCTION

Machine Translation is the application of computers to the translation of texts from one natural language into another natural language. Machine Translation is one of the important applications of Natural Language Processing. Machine translation helps people from different places to understand an unknown language without the aid of human Translator. The language to be translated is source language(SL). The language to which source language translated is Target Language(TL). India has linguistically rich area – it has 18 constitutional languages which are written in 10 different scripts. India is a Hindi speaking country. About 60%-70% population of India knows and understands Hindi. It is only about 3%-5% population who knows & understands English. Hindi is a relatively free word-order language. Hence an English to Hindi Translation systems will be of great use. **Our project is English-Hindi Machine Translation system** which is used to translate English words to Hindi. English is the source language and Hindi is the target language in our project.

Transliteration is one of the phases of Machine Translation. Transliteration is defined as the task of transcribing a word or text from one writing system into the another writing system. Cognates (the words derived from another language) and Named Entities (NE) such as the person names, names of places, organizations are the types of words that need transcribing into the another writing system. Transliteration is one module of our project.

The main objective of Machine Translation (MT) is to break the language barrier in a multilingual nation like India. Majority of the Indian population is not familiar with English while most of the information available on web or electronic information is in English. Hence a novel Machine Translation System for English to Hindi translation and transliteration is developed.

II. LITERATURE SURVEY

As India is a large multilingual country, different states have different regional languages; hence for proper communication there is a need of machine translation. Machine translation helps people from different places to understand an unknown language without the aid of human Translator. The language to be translated is source language(SL). The language to which source language translated is Target Language(TL). The major machine translation techniques are Rule-Based translation

Classification of Customer to Upgrade Profits in Retail Market with Deep Learning Methodology

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Abstract— Capital investment in retail sector and competition in the market has changed the style of marketing. At the same time the enhancements in the field of information technology provided an upper hand to the marketer to know the exact need, preference and perches trend of the customer. By knowing the actual need, preference and purchase trend of customers the marketer can make a future business plan to increase the sale and earn more profit. This paper provides a framework to the retail marketer to find the potential customer by analyzing the previous purchase history of the customer. This task can be accomplished by the use of data mining technique. In this paper we have used k-mean clustering algorithm and Naive Bayes' classifier for in identifying potential customer for a particular section of products of the retailer.

Keywords—Naive Bayes,Cluster, Centroid,Foreign Direct Investment(FDI)

I.   INTRODUCTION

According to the Global Retail Development Index 2012, India ranks fifth among the top 30 emerging markets for retail. The recent announcement by the Indian government with Foreign Direct Investment (FDI) [1] in retail, especially allowing 100% FDI in single brands and multi-brand FDI has created positive sentiments in the retail sector. Since revenue and the competition is increasing in the field of retail marketing therefore every marketer wishes is to increase profits through sales, but this can't be possible without managing customers.

Every business organization has a primary goal to increase sales and through which it earns profit. To increase sales they apply marketing and sales promotion strategies so that customers can know about their product and their promotion activities such as a discount on a particular item or an entire section. Generally for these activities organization apply mass marketing which causes decrease in intensity of effort. If they apply their effort into a particular direction then the intensity of effort will increase. The current marketing and sales promotion in retail field is almost dependent on the mass marketing. The marketer promotes the product to the mass of the customer without knowing their need of such products. Mass marketing is a market coverage strategy in which a firm decides to broadcast a message that will reach

Traditional mass marketing has focused on radio, television and newspapers are the medium used to reach the broad audience. So there is a need to overcome this problem by using computer software methodologies like machine learning [10], Data Mining and several other fields are used.

II.   RELATED WORK

The marketer may investigate the reasons a customer or a group has not purchased over a long period of time. On the basis of these three parameters the customers can be grouped into two categories, i.e. more profitable and less profitable category. For this purpose we have used K-mean clustering algorithm[11].

 Basic k-means algorithm:

1. Select K points as initial centroids.

2. Repeat

3. Form k clusters by assigning each point to its closest centroid.

4. Recompute the centroid of each cluster.

5. until centroids do not change.

      Since the k-means algorithm requires weightings point on the basis of that the transaction data can be clustered in the numbers of desired cluster.

Calculation of weighted score:

For the analysis purpose the transaction records of the

A SELF-REGULATING STREET LIGHTNING TECHNIQUE USING IOT

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Abstract: The main consideration in the present field technologies are Automation, Power consumption and cost effectiveness. Automation is intended to reduce man power with the help of intelligent systems. Power saving is the main consideration forever as the source of the power (Thermal, Hydro etc.) are getting diminished due to various reasons. As we all know that energy consumption has increased a lot and sources of energy are limited so in order to meet the increasing demand of energy use of renewable sources of energy is a must. This paper aims to describe a method for modifying street light illumination by using sensors at minimum electrical energy consumption. When presence is detected, all surrounding street lights glow at their brightest mode, else they stay in the dim mode. LED bulbs are used as they are better than conventional incandescent bulbs in every way. This will reduce heat emissions, power consumption, maintenance and replacement costs and carbon dioxide emissions. Coupled with SSSLS (Solar Smart Street Light System), massive energy-savings are envisioned. Also, a demonstration with a real-time proto type model involving costs and implementation procedure has been developed using internet of things (IoT) to visualize the real time updates of street processing and notifying the changes occur.

Keywords: LED, Arduino, IoT, IR Sensor

1. INTRODUCTION

Nowadays, human has become too busy, and is unable to find time to switch the lights wherever not necessary. The present system is like the lights will be switched on in the evening before the sun sets and they are switched off the next day morning after there is enough light on the outside. With this, the power will be wasted up to some extent. But the actual timing for these lights to be switched on are when there is absolute darkness.

This paper gives the best solution for electrical power wastage. Also, the manual operation of the lighting system is eliminated. The energy consumption in entire world is increasing at the fastest rates due to population growth and economic development and the availability of energy sources remains woefully constrained. Resource augmentation and growth in energy supply has not kept pace with increasing demand and, therefore, continues to face serious energy shortages.

Streetlights are an integral part of any developing locality. They are present on all major road- ways and in the suburbs too. Every day, streetlights are powered from sunset to sunrise at full strength, even when there is no one around. On a global scale, millions of dollars are spent each day on these street lights to provide the required electrical energy. The maintenance and replacement costs of conventional incandescent bulbs are immense. They consume a lot of electric power to function and their heat emissions are also quite high. All of this contributes to greater demand of electricity production and consequently, more carbon dioxide emissions from powerhouses.

This paper aims at harvesting the energy from renewable energy sources like sun and to effectively use the harvested energy for the benefit of mainly the remote villages (villagers) facing the serious power problems. The main aim of this paper is to provide a IoT based Automatic Street Lightning System powered with solar energy during night time. We use the word smart

A Survey of Inducing Fault Tolerance in Software Systems with Stochastic Modelling Approach

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Abstract: As fashionable society depends on the fault-free operation of complicated computing systems, system fault-tolerance has become an important demand. Therefore, we want mechanisms that guarantee correct service in cases wherever system parts fail, be they code or hardware parts. Redundancy patterns area unit usually used, for either redundancy in area or redundancy in time. Wolters book details strategies of redundancy in time that require to be issued at the correct moment. specially, she addresses the alleged "timeout choice problem", i.e., some various fault-tolerance mechanisms like restart, rejuvenation and checkpointing are the question of selecting the correct time. Restart indicates the pure system restart, rejuvenation denotes the restart of the operative atmosphere of a task, and stoping includes saving the system state sporadically. Her presentation includes a quick introduction to the strategies, their elaborated random description, and conjointly aspects of their economical implementation in real-world systems. The book is aimed at researchers and in system plausibleness, random modeling and code dependableness. Readers can realize here an up-to-date summary of the key theoretical results, creating this the sole comprehensive text on random models for restart-related issues.

Keywords: Rejuvenation, restart, stochastic, repair, randomised

I. INTRODUCTION

The Internet might appear as if simply the other network, like the telecom network of recent, cable TV network, satellite communication networks or bank transfer networks. However, once considering the particular usage patterns of the net, Associate with in exciting Nursing world of mathematical interest and curiosity unveil, to that that of networks pale as compared. Caused by the sheer variety of users and net services, still because the elegant elaborateness of the packet-based network technology, measurements of the net have discovered extremely intriguing patterns. These patterns exhibit such phenomena because the little world result, scale free networks and self-similarity, every of that one will realize mentioned extensively in widespread alike. The work rumoured during this book passed off thanks to another attention-grabbing net development, particularly that of the 'heavy tail'. It says that top transfer times are comparatively common, rather more common than with the skinny exponential tail that characterizes completion times in ancient communication networks. This includes a fascinating consequence, that underneath sure assumptions typically tested mathematically: it's often quicker to abort and rehear a transfer try than to attend for it to finish. After all, one might are caught within the serious tail, from that one will solely escape by clicking the reload button. This fascinating reality seduced United States of America into conducting analysis into the optimum temporal order of those retries (or restarts as they're going to be known as during this book). Our analysis result is in a very variety of attention-grabbing theoretical results, amid in depth experimental work (mostly dispensed by Philipp Reinecke). These classes of techniques have in common the matter of timing: however frequent ought to one perform the preventive or pre-emptive activity. Mathematically, this results in a collection of connected issues and solutions, and these type of books provides the reader with a careful data of the assorted mathematical results in they inter-relations.

II. APPLICATIONS

A. Applications of Restart

The term restart applies to job- or task-process systems similarly as dealing-process systems, all told these employment or dealing is

A Propulsive Roadmap for IoT Beyond 2025

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--ABSTRACT--

IoT is a worldwide-recognized trend that is gaining popularity incredibly fast. The baseline lies in the fact that IoT has already transformed a number of industries and took them to the new level, and these industries include healthcare, finances and much more. No wonder there is such a hype about it .There are tremendous new opportunities with IoT flowing out every couple of months so we highly recommend all to keep an eye on this technology. In this paper will have shed light on the inherent concepts which will affect the working of IoT beyond 2025.We have discussed key points in this paper regarding the operational components of an IoT System where improvements can be done by researchers so as to leverage the usage of IoT environment.

Keywords - IoT, Nano, Sensors, Cognitive, network, RFID.

I. INTRODUCTION

The Internet of Things may be a captivating issue in the business anyway it is definitely not another thought. In the mid 2000's, Kevin Ashton was laying the arrangement for what may transform into the Internet of Things (IoT) at MIT's AutoID lab. Ashton was one of the pioneers who envisioned this idea as he examined for ways that Delegate and Gamble could improve its business by interfacing RFID information to the Internet. The thought was essential yet competent. If all things in step by step life were furnished with identifiers and remote accessibility, these things could be talk with each other and be regulated by PCs.

The term Internet of Things (IOT) has been around for a long time. In this circumstance, it is gaining ground with the improvement of front line remote development. The principal thought of this thought is the closeness of an arrangement of articles –, for instance, RFID, NFC, sensors, actuators, mobile phones. In this IOT development the RFID is the most basic thought and it is essential for web of things. Unmistakable developments in publicize like RFID, machine to machine correspondence, vehicle to vehicle correspondence molecule etc. are actualized using IOT[8]. The basic issue of IOT is going up against circumstance of security the potential Hackers who always on edge to strike. The ability to code and track objects has empowered associations to end up more powerful, quicken shapes, lessen bumble, keep away from robbery, and join mind boggling and adaptable legitimate systems through IOT.
The "Internet of Things" alludes to the coding and systems

the present time, the nonappearance of interoperability is baffling expansive utilize. An average tongue could be an answer and the contraptions itself need to wind up more watchful. A characteristic living being passes on in each cell the aggregate genotype with solitary "working rules". This could be a perspective for the Internet of Things.

Today, all the different devices with their individual limits inside the Internet of Things give by methods for their own, prohibitive procedures. Honestly, there are presently an extensive variety of genuine standards, it's essentially that these restrictive occur inside each individual industry. If you have to relate the particular regions and devices with each other, a foundation quickly ends up being astoundingly awesome.

A focal control unit makes IoT environments susceptible: The normal "connector" to date is by methods for a principle issue. Sensors assemble data and send these to a gateway or cloud server. Starting there the data is deciphered and actuators controlled suitably. In the field of building robotization, this can frequently be things like warming controls, light switches, modernized entryway or shade controls[9]. In solitude nevertheless, without the central section or cloud game plan, most of the sensors and actuators are all around defenseless. Just by virtue of learning inside that central control unit they can fulfill their work and team up with each other.

II. INTERNET OF THINGS ARCHITECTURE AND TECHNOLOGY

A. Cognitive Architectures:

A Review of Robust Techniques for Enhancing Anonymity in Delay and Disruption Tolerant Network

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Abstract—Research on Delay and Disruption Tolerant Networks (DTNs) challenges the normal assumption of end-to end property, extending networked communication to e.g. intermittently connected devices, ad-hoc mobile environments, first-responder disaster situations, etc. In such environments, making certain the safety and privacy of each content, networks, and participants is commonly important. during this work, we have a tendency to think about DTN namelessness and privacy. The disconnected nature of DTNs presents a novel issue for ancient namelessness approaches, particularly restricted data of different nodes and methods within the dynamic, mobile network. we have a tendency to develop a selected answer, the brink Pivot theme (TPS), to supply namelessness and sender-receiver unlinkability in DTNs. Our scheme, supported secret sharing primitives, permits a user-selectable level of namelessness, a crucial feature for DTN environments that has to balance security and value. Through simulation and analytical analysis, we have a tendency to measure the performance and overhead of TPS and notice that it addresses the constraints of DTNs whereas providing a appropriately high-level of namelessness.

Keywords-DTN,Delay,key, communication,Anonymity

I. INTRODUCTION

Modern network communication typically assumes immediate and reliable end-to-end property. This assumption is true in environments cherish the web, however, there's an oversized category of networks, questionable challenged networks, wherever it doesn't hold. samples of such networks embrace media, sensor, and satellite networks, and mobile, vehicular, first-responder, and military ad-hoc networks. These networks area unit characterized by restricted resources, intermittent property, and probably long delays and low information rates. Interest in these challenged environments has burning analysis in Delay and Disruption Tolerant Network (DTN) architectures. DTNs facilitate intelligent store-and-forward behavior to produce ultimate information delivery once a contemporaneous end-to-end path doesn't exist within the network. style and development of DTN protocols is presently ongoing. whereas developing operational systems and demonstrating practicableness has been a primary goal of DTN analysis, the protection of DTNs is setting out to receive attention. The foundations for basic security are made public, as well as information origin authentication, integrity, and confidentiality primitives. However, DTNs gift new and distinctive security challenges as a results of restricted

resources and lack of end-to-end property. Farrell et al. argue that key management, traffic analysis, policy social control,

and node introduction area unit the core challenges in DTNs; we have a tendency to argue for adding namelessness to the present list.

We logically divide DTN namelessness into 2 classes, identity and placement. Identity namelessness implies that the identity of a traffic supply is hidden to all or any different nodes, as well as the traffic recipient. Location namelessness considerations the invention of, or advancement in, data of geographic location from info leaked in messages.

Many examples are advanced in literature and follow wherever namelessness is efficacious, and sometimes valuable. Some examples include: on-line journaling and blogging for individuals visiting, working, or living during a country that censors or blocks traffic, enforcement operations involving observance criminal activity during which success depends on hiding, and human rights employees or "whistleblowers" United Nations agency may otherwise resist speaking get in concern of physical attacks or threats from those with opposing viewpoints or motives. namelessness prevents these forms of actions from being connected to

Survey of Application Domains of Metamorphic Testing : Novel Perspectives

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Abstract—Metamorphic testing (MT) is a software testing mechanism that tries to solve the test oracle problem. A test oracle is the one which helps a tester to deduce if a program has failed. A test oracle problem arises when it is tedious to find the expected outcomes of selected test cases or to find if the actual outputs agree with the expected outcomes. MT advocates that, if we have one or more test cases in hand and their expected outcomes, one or more follow-up test cases can be developed to verify the essential properties (called "metamorphic relations" or "MRs") of the system or function to be implemented. This paper is a honest attempt to provide an insight of how metamorphic testing can be done in various real time scenarios and the enhanced benefits of deploying this technique to perform effective software testing.

Keywords— Metamorphic testing ,test oracle, test case, bug, defect

I. INTRODUCTION

Software testing is an essential but costly activity applied during software development to detect faults in programs. Testing consists of executing a program with test inputs, and to detect faults there needs to be some procedure by which testers can agree whether the product of the program is correct or not, a so–called test oracle (i.e the tester or an external mechanism can accurately decide whether the output produced by a program is correct or not).

Metamorphic testing is a technique conceived to alleviate the oracle problem. It is based on the idea that often it is simpler to reason about relations between outputs of a program, than it is to fully understand or formalise its input-output behaviour. Metamorphic testing does not only alleviate the oracle problem, but it can also be highly automated.

History Of Metamorphic Testing(Mt)

Since its first publication in 1998, quite number of studies have been conducted on various aspects of MT. In recent years especially, MT has been attracting an increasing amount of attention and has helped detect large number of real-life faults. It was a surprise to the software testing community, an influential studies if either they opened new and important research directions for MT or their results have had significant impact.

For example, some studies presented various approaches to systemically generate metamorphic relations. Other studies proposed the innovative application of MT to, among others, proving, debugging , fault localization, fault tolerance and program repair . Still other studies, have had the surprising and striking results of detecting real-life bugs in, among others, popular compilers and search engines.

II. NEEDS AND BASIC MECHANISM OF METAMORPHIC TESTING

Identity relations are a well-known concept in testing and have been used even before the introduction of metamorphic relations. For example, Blum et al checked whether numerical programs satisfy identity relations such as $P(x) = P(x1) + P(x2)$ for random values of x1 and x2. In the context of fault tolerance, the technique of data diversity runs the program on re-expressed forms of the original input; e.g., $\sin(x) = \sin(a) \times \sin(\pi/2 - b) + \sin(\pi/2 - a) \times \sin(b)$ where $a+b = x$. The concept of metamorphic testing, introduced by Chen in 1998, generalises these ideas from identity relations to any type of relation, such as equalities, inequalities, periodicity properties, convergence constraints, subsumption relationships and many others. In general, a metamorphic relation for a function f is expressed as a relation among a series of function inputs x_1, x_2, . . . , x_n (with n > 1), and their corresponding output values $f(x_1)$, $f(x_2)$, . . . , $f(x_n)$. For instance, for the sine example from the introduction the relation between x_1 and x_2 would be $\pi = x_1 = x_2$, and the relation between $f(x_1)$ and $f(x_2)$ would be equality, i.e.: $R = \{(x_1, x_2, \sin x_1, \sin x_2) \mid \pi - x_1 = x_2 \rightarrow \sin x_1 = \sin x_2\}$ This resembles the traditional concept of program invariants, which are properties (for example expressed as assert statements) that hold at certain points in programs . However, the key difference is that an invariant has to hold for every possible program execution, whereas a metamorphic relation is a relation between different executions.

The Vulnerabilities of Rogue Algorithms: Novel Perspectives

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Abstract: Given the majority of this current, it's hard to conceptualize oversight for algorithms, notwithstanding when they've turned out badly and are currently damaging individuals. So far as that is concerned, not a wide range of damage is unmistakably quantifiable in any case. One can make the contention that, what with all the spurious news gliding around, our popular government has been damaged. In any case, how would you quantify democracy? This shouldn't imply that there is no expectation. All things considered, by definition, an unlawful algorithms is collapsing upon a real law that we can point to. There is, at last, somebody that ought to be considered responsible for this. The issue still remains; in what capacity such laws will be implemented

Keywords- Rogue, AI, Bias, Deep Learning

I. INTRODUCTION

Every technology is built over a set of robust algorithms whose functionality is imitating a set of instructions as given by the user. Theoretically algorithms are supposed to be impartial. They are supposed to do as intended. But as more and more algorithms are embedded with learning ability, the probability of failure or degree of error proneness also increases. We call this as "rogue" factor and algorithms which are affected by this rogue factor are termed to be rogue – algorithms. The main reason algorithms goes bad is, how a concept is taught in the real world.

Humans are biased, so the programmers who code the programs unintentionally induce rogueness in the algorithms. In the recent time, many such incidents involving rogue algorithms have come into light. For instance, in Broward country, Florida,an application used by the local government was deployed to do an assessment of likelihood of criminals offending again. The rogue algorithm mistakenly assigned a lower risk score to a hardened criminal than a first time offender based on the color of the person. The famous controversy of the Facebook trending the fake news stories is worth noting. Such incidents may result into undesirable results like wrong people being arrested or getting sick or facing difficulties which could have been avoided. Most of the rogue algorithms derive predictions based on the historical data.

A rogueness free algorithm is difficult to design when it becomes to handle a complex situation. Tech communities are trying hard to face this challenge. Most of the training sets have to be robust in the sense, that they should incorporate data from reliable sources in an impartial way. Imagine a context of price fixing which involves human negotiations, rogue algorithms can trick a user defective commodities or cheap-commodities while trading online because it is designed to do so. Also, it is not illegal as the algorithm designer had been advised to do so by the vendors. Everything comes into consideration when such indirect conclusions are to be made. The rogue factor depends on numerous factors like uncertainty of human behaviour, uncertainty in data input, uncertainty in environments. The AI models have to be retrained periodically, else it would result into disasters. AI models are perception of human cognition and behaviour. The best AI must be integrated with correct human knowledge base. Also, humans who give feedback to the AI system should be expert in their domains as well as unbiased. Rogue algorithms have the ability to make hunting person as hunted. Provisions are required in the system to control selection and disposition of human subjects. We cannot penalise a rogue algorithms are responsible for handcrafting them.

In 2008, most of the financial markets blamed the rogue algorithms which governed the trust models used in the applications. The most dominant trading algorithms uses past data from the market which are unpredictable pattern in themselves. The rogueness arrives from such unpredictable-data. To restrict the rogue factor humans have to work side by side with the algorithms on which they depend heavily. At least in the view of recent mishaps due to the rogue algorithms so that they do damage which is controllable. Our perspective is not only basis to uncover limitations of algorithms which can go rogue but also provides a sincere attempt to demoralize algorithm designer who take advantage of weakness existing in human cognition.

II. DE-BIASING ROGUE ALGORITHMS:

Numerous online systems display various biases with respect to discrimination based on race, color, gender. One of the popular way to de-bias algorithms is to eliminate gender based word – embedding. In machine- learning focus is been placed on 'fair' binary classification in particular. The research challenge is the difficulty while the evaluation of embedding quality to draw the conclusion for definition of bias. Already notable work has been done to modify or enhance the classification algorithms to achieve the degree of fairness such that the result

Green IOT: Principles, Current Trends, Future Directions

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Abstract

The two trending and popular technologies are Cloud Computing (CC) and the Internet of Things (IoT) are current hot discussions in the field of agriculture and healthcare applications. Motivated by achieving a sustainable world, this paper discusses various technologies and issues regarding green cloud computing and green Internet of Things, further improves the discussion with the reduction in energy consumption of the two techniques (CC and IoT) combination in agriculture and healthcare systems. The history and concept of the hot green information and communications technologies (ICT's) which are enabling green IoT will be discussed. Green computing introduction first and later focuses on the recent works done regarding the emerging technologies. Finally, lists out the advantages, challenges, and future research directions related to green application design. Our research aims to make green area broad and contribution to sustainable application world.

1. Introduction to Green IoT

Security in IoT is a nightmare in spite of its good use on a large-scale. Generally, IoT is a combination of three main technologies.

- Information Technology
- Operations Technology
- Consumer Technology

Internet of Things is a network of electronics, home appliances, vehicles, entrenched with electronics, software, sensors, actuators and network connectivity, which enables these objects to connect and exchange data. Each thing is uniquely identified using its built-in address, and is able to inter-operate within the exiting internet infrastructure.

Smart world is beholding as an era in which objects can automatically and intelligently serve people in a collectible manner. Internet of Things (IoT) connectseverything in the smart world. Particularly, an overview regarding IoT and green IoT is performed first. Then, the hot green information and communications technologies (ICTs) enabling green IoTare studied, and general green ICT principles are epitomized. Furthermore, the latest developments and future vision about sensor cloud, which is a novel paradigm in green IoT, are reviewed and introduced, respectively. Our work targets to be an enlightening and latest guidance for research with respect to green IoT and smart world.

IoT ELEMENTS In this section we have listed and discussed on some key elements for IoT and IoT based applications. If we classify IoT elements/components into few basic categories that aids seamless connectivity then it can be as followed: (i) Hardware (ii) Middleware (iii) User End Visualization actuators, embedded devices and other communication

Hardware constitutes of various sensors, actuators, embedded devices and other communication devices. Middleware constitutes of various tools used for on demand storage of data collected by sensor devices and processed by embedded devices and various computing tools used for data analytics.User End Visualization consists of various data visualization and interpretation tools which can be accessed on various diverse platforms which aids the enduser to keep a track of various events driven by those data collected by various sensory hardware. We have highlighted few breakthrough and enabling technologies in the above mentioned categories which

Fig.1: Overview of Green IoT

The numerous applications of Green IoT are as follows:

A. Smart Home: A G-IoT enables home equipped withlighting, heating, and electronic devices that can be

controlled remotely by using smartphone or computer. It can be equipped with Waste removal, Ultrasonic showers, Beds that make/change sheets themselves, Lighting creates artificial sunrise, Computer suggests clothing based on your taste, weather, Windows and walls will allow adjustable amounts of sunlight, warmth or cold in, Electronic soundproof rooms and windows. Soundproof energy fields that you can walk through, Hidden computers, sensors, microphones and electronics throughout the house. Central computer accepts voice commands, distinguishes between occupants for personalized responses and actions, Television, computer and phone merge into one device etc.

B. Industrial Automation: Industries have beenautomated with machines that allow for fully automated tasks without or with little manual intervention. An internet based industry

A Neoteric Vision of Cultural Algorithms: Principles, Practices, Future Directions

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Abstract- Cultural Algorithms are computational models of Cultural Evolution. Thusly they give a system inside which encounters of issue solvers installed in a social texture impact the aggregate learning of that gathering, its Culture. Culture is seen as a system of detached and dynamic information sources. These information sources are capable incorporate this information, either separately or all things considered, into their structure utilizing information mining and machine learning devices. This refreshed Cultural Knowledge at that point is utilized to guide the alterations to people and their plans in the populace space. Social Algorithms are a perfect system for issues that require a lot of area information to coordinate the aggregate choices of people in the populace. All things considered Cultural Algorithms have been effectively connected to issues in complex various levelled frameworks portrayed by huge and broad informational collections (huge information), numerous space limitations, different targets, and various operators inside a vast and spatially circulated interpersonal organization. These applications incorporate the advancement of urban focuses, the ascent and decrease of old and current social frameworks, building structure and enhancement, medicinal services applications, diversion and mechanical controller configuration, arranging in assembling and industry, environment development, and bioinformatics.

Keywords— cultural algorithm, mutation, genetic, optimization, reliability

I. INTRODUCTION

Cultural algorithms are a branch of evolutionary computation where there is a knowledge component that is called the belief space in addition to the population component. In this sense, cultural

customs, and morals of a member of society. Culture is viewed as a network of passive and active knowledge sources. These knowledge sources are able integrate this knowledge, either individually or collectively, into their structure using data mining and machine learning tools. This updated Cultural Knowledge then is used to direct the modifications to individuals and their plans in the population space. Cultural algorithms can be viewed as a dual inheritance system where at each step, both at population level and acquired belief transmitted to next generation. Early work was more concerned with the classification and description of cultures than the processes by which culture algorithms was developed. Later research was done and provided a framework of functional aspects of cultural systems could be asserted relative to environments. Cultural Algorithms have been successfully applied to problems in complex hierarchical systems characterized by large and extensive data sets (big data), many domain constraints, multiple objectives, and multiple agents within a large and spatially distributed social network.

II. PRINCIPLES

Basic pseudo code for cultural algorithms

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Initialize Belief Space BLF(t);
repeat
Evaluate Population POP(t);
Adjust(BLF(t), Accept(POP(t)));
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and node introduction area unit the core challenges in DTNs; we have a tendency to argue for adding namelessness to the present list.

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Many examples are advanced in literature and follow wherever namelessness is efficacious, and sometimes valuable. Some examples include: on-line journaling and blogging for individuals visiting, working, or living during a country that censors or blocks traffic, enforcement operations involving observance criminal activity during which success depends on hiding, and human rights employees or "whistleblowers" United Nations agency may otherwise resist speaking get in concern of physical attacks or threats from those with opposing viewpoints or motives. namelessness prevents these forms of actions from being connected to AN identity on a network. Existing DTN applications that fall under the higher than usage eventualities and demand for namelessness embrace blogging, internet serving and water sport, electronic message, and interactive voice electronic

Application of AI in Network Intrusion Data Analysis and Intrusion Detection

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ABSTRACT

As new security intrusionsarise so does the demand for viable intrusion detection systems. These solutions must deal with huge data volumes, high speed network traffics and countervail new and various types of security threats. In this paper we combine existing technologies to construct an Anomaly based Intrusion Detection System. Our approach improves the Support Vector Machine classifier by exploiting the advantages of a new swarm intelligence algorithm inspired by the environment of microbats (Bat Algorithm). The main contribution of our paper is the novel feature selection model based on Binary Bat Algorithm with L´evy flights. To test our model we use the NSL-KDD data set and empirically prove that L´evy flights can upgrade the exploration of standard Binary Bat Algorithm. Furthermore, our approach succeeds to enhance the default SVM classifier and we obtain good performance measures in terms of accuracy (90.06%), attack detection rate (95.05%) and false alarm rate (4.4%) for unknown attacks.

INDEX TERMS: Intrusion Detection, SVM, Bat Algorithm, Binary Bat Algorithm, L´evy Flights.

INTRODUCTION

Many of our activities imply using the Internet (online payments, internet banking, social networks or searching for informations) and almost all government or private organizations store critical data over the networks. This increasing usage and growing speed of network connections has determined the proliferation of various threats. In this context security systems have become vital components. Despite the recent advances, security incidents are on the rise. IDS have become an indispensable component of almost every security infrastructure, mainly because they provide a wall of defense and resist external attacks effectively, where other traditional security systems cannot perform well. Intrusion Detection Systems (IDS) monitor the activities and events occurring in the systems and decide if these are intrusive actions or normal usage of the system. In general, IDS are classified on the basis of their data analysis technique as: misuse and anomaly detection. The misuse method is very accurate in detecting known attacks based on their signatures that are stored in the database. The anomaly detection approach automatically constructs a normal behavior of the systems. This latter method can

Generic Deep Learning Model for Digital Image forgery detection

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ABSTRACT

The advancements of technology in every aspect of the current age are leading to the misuse of data. Researchers, therefore, face the challenging task of identifying these manipulated forms of data and distinguishing the real data from the manipulated. Splicing is one of the most common techniques used for digital image tampering; a selected area copied from the same or another image is pasted in an image. Image forgery detection is considered a reliable way to verify the authenticity of digital images. In this study, we proposed an approach based on the state-of-the-art deep learning architecture of ResNet50v2. The proposed model takes image batches as input and utilizes the weights of a YOLO convolutional neural network (CNN) by using the architecture of ResNet50v2. In this study, we used the CASIA_v1 and CASIA_v2 benchmark datasets, which contain two distinct categories, original and forgery, to detect image splicing. We used 80% of the data for the training and the remaining 20% for testing purposes. We also performed a comparative analysis between existing approaches and our proposed system. We evaluated the performance of our technique with the CASIA_v1 and CASIA_v2 datasets. Since the CASIA_v2 dataset is more comprehensive compared to the CASIA_v1 dataset, we obtained 99.3% accuracy for the fine-tuned model using transfer learning and 81% accuracy without transfer learning with the CASIA_v2 dataset. The results show the superiority of the proposed system.

Keywords: machine learning; deep learning; image forgery; ResNet50; YOLO CNN; CASIA

INTRODUCTION

Due to technological advancements and globalization, electronic equipment is now widely and inexpensively available. As a result, digital cameras have grown in popularity. There are many camera sensors all around us, and we use them to collect a lot of images. Images are required in the form of a soft copy for various documents that must be filed online, and a large number of images are shared on social media every day. The amazing thing about images is that even illiterate people can look at them and extract information from them. As a result, images are an integral component of the digital world, and they play an essential role in storing and distributing data. There are numerous tools accessible for quickly editing the images [1,2]. These tools were created with the intention of enhancing and improving the images. However, rather than enhancing the image, some people exploit their capabilities to falsify images and propagate falsehoods [3,4]. This is a significant threat, as the damage caused by faked images is not only severe, but also frequently irreversible. There are two basic

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ISSN 2319 – 1953

International Journal of Scientific Research in Computer Science Applications and Management Studies

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Abstract—Research on Delay and Disruption Tolerant Networks (DTNs) challenges the normal assumption of end-to end property, extending networked communication to e.g. intermittently connected devices, ad-hoc mobile environments, first-responder disaster situations, etc. In such environments, making certain the safety and privacy of each content, networks, and participants is commonly important. during this work, we have a tendency to think about DTN namelessness and privacy. The disconnected nature of DTNs presents a novel issue for ancient namelessness approaches, particularly restricted data of different nodes and methods within the dynamic, mobile network. we have a tendency to develop a selected answer, the brink Pivot theme (TPS), to supply namelessness and sender-receiver unlinkability in DTNs. Our scheme, supported secret sharing primitives, permits a user-selectable level of namelessness, a crucial feature for DTN environments that has to balance security and value. Through simulation and analytical analysis, we have a tendency to measure the performance and overhead of TPS and notice that it addresses the constraints of DTNs whereas providing a appropriately high-level of namelessness.

Keywords-DTN,Delay,key, communication,Anonymity

I. INTRODUCTION

Modern network communication typically assumes immediate and reliable end-to-end property. This assumption is true in environments cherish the web, however, there's an oversized category of networks, questionable challenged networks, wherever it doesn't hold. samples of such networks embrace media, sensor, and satellite networks, and mobile, vehicular, first-responder, and military ad-hoc networks. These networks area unit characterized by restricted resources, intermittent property, and probably long delays and low information rates. Interest in these challenged environments has burning analysis in Delay and Disruption Tolerant Network (DTN) architectures. DTNs facilitate intelligent store-and-forward behavior to produce ultimate information delivery once a contemporaneous end-to-end path doesn't exist within the network. style and development of DTN protocols is presently ongoing. whereas developing operational systems and demonstrating practicableness has been a primary goal of DTN analysis, the protection of DTNs is setting out to receive attention. The foundations for basic security are made public, as well as information origin authentication, integrity, and confidentiality primitives. However, DTNs gift new and distinctive security challenges as a results of restricted

resources and lack of end-to-end property. Farrell et al. argue that key management, traffic analysis, policy social control,

and node introduction area unit the core challenges in DTNs; we have a tendency to argue for adding namelessness to the present list.

We logically divide DTN namelessness into 2 classes, identity and placement. Identity namelessness implies that the identity of a traffic supply is hidden to all or any different nodes, as well as the traffic recipient. Location namelessness considerations the invention of, or advancement in, data of geographic location from info leaked in messages.

Many examples are advanced in literature and follow wherever namelessness is efficacious, and sometimes valuable. Some examples include: on-line journaling and blogging for individuals visiting, working, or living during a country that censors or blocks traffic, enforcement operations involving observance criminal activity during which success depends on hiding, and human rights employees or "whistleblowers" United Nations agency may otherwise resist speaking get in concern of physical attacks or threats from those with opposing viewpoints or motives. namelessness prevents these forms of actions from being connected to AN identity on a network. Existing DTN applications that fall under the higher than usage eventualities and demand for namelessness embrace blogging, internet serving and water sport, electronic message, and interactive voice electronic

NLTP and ML technique for Text categorization

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ABSTRACT

Text classification is the process of classifying documents into predefined categories based on their content. Existing supervised learning algorithms to automatically classify text need sufficient documents to learn accurately. This paper presents a new algorithm for text classification that requires fewer documents for training. Instead of using words, word relation i.e association rules from these words is used to derive feature set from preclassified text documents. The concept of Naïve Bayes classifier is then used on derived features and finally only a single concept of Genetic Algorithm has been added for final classification. Experimental results show that the classifier build this way is more accurate than the existing text classification systems.

INTRODUCTION

In this paper we describe CarmelTC, a novel hybrid text classification approach for analyzing essay answers to qualitative physics questions. In our evaluation we demonstrate that the novel hybrid CarmelTC approach outperforms both Latent Semantic Analysis (LSA) (Landauer et al., 1998; Laham, 1997) and Rainbow (McCallum, 1996; McCallum and Nigam, 1998), which is a Naïve Bayes approach, as well as a purely symbolic approach similar to (Furnkranz et al., 1998). Whereas LSA and Rainbow are pure "bag of words" approaches,CarmelTC is a rule learning approach where rules for classifying units of textrely on features extracted from a syntactic analysis of

that text as well as on a "bag of words" classification of that text. Thus, our evaluation demonstrates the advantage of combining predictions from symbolic and "bag of words" approaches for text classification. Similar to (Furnkranz et al., 1998), neither CarmelTC nor the purely symbolic approach require any domain specific knowledge engineering or text annotation beyond providing a training corpus of texts matched with appropriate classifications, which is also necessary for Rainbow, and to a much lesser extent for LSA. CarmelTC was developed for use inside of the Why2-Atlas conceptual physics tutoring system (VanLehn et al., 2002; Graesser et al., 2002) for the purpose of grading short essays written in response to questions such as "Suppose you are running in a straight line at constant speed. You throw a pumpkin straight up. Where will it land? Explain." This is an appropriate task domain for pursuing questions about the benefits of tutorial dialogue for learning because questions like this one are known to elicit robust, persistent misconceptions from students, such as "heavier objects exert more force." (Hake, 1998; Halloun and Hestenes, 1985). In Why2-Atlas, a student first types an essay answering a qualitativephysics problem. A computer tutor then engages the student in a natural language dialogue to provide feedback, correct misconceptions, and to elicit more complete explanations. The first version of Why2-Atlas was deployed and evaluated with undergraduate students in the spring of 2002; the system is continuing to be actively developed (Graesser et al.,

A Hybrid framework for Identifying similarity of text and image data from documents

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ABSTRACT

Identifying plagiarized content is a crucial task for educational and research institutions, funding agencies, and academic publishers. Plagiarism detection systems available for productive use reliably identify copied text, or near-copies of text, but often fail to detect disguised forms of academic plagiarism, such as paraphrases, translations, and idea plagiarism. To improve the detection capabilities for disguised forms of academic plagiarism, we analyze the images in academic documents as text-independent features. We propose an adaptive, scalable, and extensible image-based plagiarism detection approach suitable for analyzing a wide range of image similarities that we observed in academic documents. The proposed detection approach integrates established image analysis methods, such as perceptual hashing, with newly developed similarity assessments for images, such as ratio hashing and position-aware OCR text matching. We evaluate our approach using 15 image pairs that are representative of the spectrum of image similarity we observed in alleged and confirmed cases of academic plagiarism. We embed the test cases in a collection of 4,500 related images from academic texts. Our detection approach achieved a recall of 0.73 and a precision of 1. These results indicate that our image-based approach can complement other content-based feature analysis approaches to retrieve potential source documents for suspiciously similar content from large collections. We provide our code as open source to facilitate future research on image-based plagiarism detection.

INTRODUCTION

Academic plagiarism has been defined as "the use of ideas, concepts, words, or structures without appropriately acknowledging the source to benefit in a setting where originality is expected". Forms of academic plagiarism vary in their degree of obfuscation ranging from unaltered copies (copy&paste), to slightly altered forms of plagiarism, such as interweaving text passages from multiple sources (shake&paste), to disguised forms of plagiarism, including paraphrases, translations, and idea plagiarism, and even the plagiarism of academic data. The easily identifiable copy&paste-type plagiarism is more prevalent among students, while heavily modified plagiarism is more characteristic of researchers, who have strong incentives to avoid detection by skillfully disguising unoriginal content. Research on plagiarism detection (PD) has yielded mature systems employing text retrieval to find similar documents. These systems reliably retrieve documents containing copied text, but

Application of Deep Neural Network for Stock Value Prediction and Analysis from Text Data

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ABSTRACT:

The recent advance of deep learning has enabled trading algorithms to predict stock price movements more accurately.Unfortunately, there is a significant gap in the real-world deployment of this breakthrough. For example, professionaltraders in theirlong-term careers have accumulated numerous trading rules, the mythof which they can understand quite well. On the other hand, deep

learning models have been hardlyinterpretable. This paper presents Deep Clue, a system built to bridge text-based deep learning modelsand end users through visually interpreting the key factors learned in the stock price prediction model. We make three contributions inDeepClue. First, by designing the deep neural network architecture for interpretation and applying an algorithm to extract relevantpredictive factors, we provide a useful case on what can be interpreted out of the prediction model for end users. Second, by exploringhierarchies over the extracted factors

and displaying these factors in an interactive, hierarchical visualization interface, we shed light onhow to effectively communicate the interpreted model to end users. Specially, the interpretation separates the predictable fromthe unpredictables for stock prediction through the use of intercept model parameters and a risk visualization design. Third, we evaluate theintegrated visualization system through two case studies in predicting the stock price with online financial news and company-relatedtweets from social media. Quantitative experiments comparing the proposed neural network architecture with state-of-the-art models andthe human baseline are conducted and reported. Feedbacks from an informal user study with domain experts are summarized and discussed in details. All the study results demonstrate the effectiveness of DeepClue in helping to complete stock market investment andanalysis tasks.

Categorization of Noxious comments from OSN using machine learning

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ABSTRACT

Toxic comments are disrespectful, abusive, or unreasonable online comments that usually make other users leave a discussion. The danger of online bullying and harassment affects the free flow of thoughts by restricting the dissenting opinions of people. Sites struggle to promote discussions effectively, leading many communities to limit or close down user comments altogether. This paper will systematically examine the extent of online harassment and classify the content into labels to examine the toxicity as correctly as possible. Here, we will use six machine learning algorithms and apply them to our data to solve the problem of text classification and to identify the best machine learning algorithm based on our evaluation metrics for toxic comments classification. We will aim at examining the toxicity with high accuracy to limit down its adverse effects which will be an incentive for organizations to take the necessary steps. Keywords—Machine Learning, Toxic Comments Classification, Text Classification, Accuracy

1. INTRODUCTION:

The exponential development of days, it was a big task to classify the emails as positive or negative i.e. spam or notspam. As time flows, communication, and flow of data over the internet got changed drastically, especially after the appearance of social media sites. With the advancement of social media, it becomes highly important to classify the content into positive and negative terms, to prevent any form of harm to society and to control antisocial behavior of people. In recent times there have many instances where authorities arrest people due to their harmful and toxic social media contents[1]. For example, one 28-year-old man was arrested in Bengal for posting an abusive comment against Mamata Banerjee on Facebook and one man from Indonesia was arrested for insulting the police of Indonesia on Facebook. Thus,

there is an alarming situation and it is the need of the hour to detect such content before they got published because these negative contents are creating the internet an unsafe place and affecting people adversely. Suppose there is a comment on social media -Nonsense? Kiss off, geek. What I said is truel, it can be easily identified that the words like Nonsense and Kiss off are negative and thus this comment is toxic. But to mine the toxicity technically this comment needs to go

Robust Fault-Tolerant Training Strategy Using Neural Network To Perform Functional Testing Of Software

Article PDF :

Article Type :
Original Article

Author :
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Abstract :
This paper is intended to introduce an efficient as well as robust training mechanism for a neural network which can be used for testing the functionality of software. The traditional setup of neural network architecture is used constituting the two phases -training phase and evaluation phase. The input test cases are to be trained in first phase and consequently they behave like normal test cases to predict the output as untrained test cases. The test oracle measures the deviation between the outputs of untrained test cases with trained test cases and authorizes a final decision. Our framework can be applied to systems where number of test cases outnumbers the functionalities or the system under test is too complex. It can also be applied to the test case development when the modules of a system become tedious after modification.

IoET: From Paradox To Paradigm

AUTHORS

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Darapu Uma

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ABSTRACT

The current importance and future promises of the Internet of Things(IoT), Internet of Everything(IoET) are diligently discussed in this paper. The analysis clearly distinguishes between IoT and IoET which are mostly considered to be the same by novices. Upon examining the current advancement in the fields of IoT, IoET, the paper presents scenarios or the possible future expansion of their applications also considering security aspects as same.

A Survey of Cyber foraging systems: Open Issues, Research Challenges

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--ABSTRACT--
This paper presents a survey on current applications which practice the pervasive mechanism of cyber foraging. The applications include the LOCUSTS framework, Slingshot, Pupetter. This applications advocated the operating principle of task sharing among resource deficient mobile devices. These applications face some design issues for providing efficient performance like task distribution and task migration apart from the security aspect. The general operating mechanism of the cyber foraging technique are also discussed upon and the design options to leverage the throughput of the inherent mechanism is also represented in a suitable way.

Keywords - **Cyber foraging, resource deficient, LOCUSTS, Sligshot, Pupetter, Task migration.**

I. INTRODUCTION

Cyber foraging refers to pervasive computing mechanism where resource deficient, mobile devices offload some of their heavy task to stronger surrogate machines in the surroundings. The term cyber foraging was given by Mr. M. Satyanarayanan in his 2001 paper. Cyber foraging, helps the mobile devices to take on more resource intensive tasks by leveraging unused resources on larger computers in the vicinity. Cyber foraging is foraging for a multiple   resource types   , not limited to processing power. Among the resources that can   be foraged for is network connectivity, storage, processing power, bandwidth and much more. All of these resource types are equally important in a cyber foraging scenario. There are many possible usage scenarios where cyber foraging can be utilized. Some designs for pervasive computing advocates for wearable computing devices which include small computing devices that may be worn by their users like clothes[1]. Users of such devices are not interested in carrying around equipment which are heavy, and these devices must therefore be as lightweight as possible. This is opposite to the user's need   to have as powerful a device as possible. The desired computing power can be added to these small wearable devices through techniques such as cyber foraging. Consider the following situation   : a doctor doing house calls is wearing a small headset (similar in size and form to the well-known Bluetooth headsets for mobile phones). Using

some of the recordings to these machines who respond by returning the translated text[2]. In case the surrogate has an Internet connection it may even be given the task of updating the patient's journal directly. After translation the headset may discard the recording and thus free storage for additional recordings. In the preceding scenario   the application running on the mobile device works in two modes; high fidelity and low fidelity. When no surrogates are within range the headset simply saves the recordings (low fidelity), and when surrogates can be used the recordings are immediately translated into text (high fidelity). This high/low fidelity aspect is inherent in all cyber foraging applications, when surrogates are available high quality work may be done, but this does not mean that the applications will only work in the presence of surrogates. For cyber foraging to be usable a low fidelity setting must also be possible, where the mobile device itself is running the application, but   at a diminished fidelity. In the scenario low fidelity means that the headset only stores the recordings, but it would also be possible to ask the mobile device to do the processing itself, or even to do it in combination with other mobile devices that reside in the doctors personal area network. To be able to perform the actions described above a number of things are needed. At first the mobile device must be able to monitor the network looking for any available surrogates[3]. Once found the mobile device must be able to distribute tasks to surrogate machines, and, in the case that the user is moving while tasks are being performed,

A Improved Software Architecture For Supervising The Fidelity Of Distributed Systems

Authors:

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References (9)

Abstract

This paper represents the challenge of software architecture according to fidelity prediction. In a distributed computing environment a improved statistical model is used for unearthing the most suitable algorithms corresponding to performance needs for each specific software application. The proposed technique is based on a variant chain of automatic data collection, which has provided us the possibility to adjust, during the execution, the mechanism of fault management. We propose a monitoring scheme with high degree of dynamism and docility . In this fidelity scheme we define a specific library for file accesses and conversation so as to keep track of files and communication usage. The technique imbibes a self-contained architecture for distributed systems, which allows us to supervise the collection of the statistical data and to support the execution of the applications in a non-reliable operational environment. The main benefit of the proposed technique is that it provides us the chance to constitute the software architecture as per the most up to date requirements.

IOT Security Challenges and Measures to Mitigate: Novel Perspectives

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Abstract

The Internet Of Things describes the ever-growing number of intelligent objects that are being connected to the internet and each other, smartphones, tablets, wearable technology and smart home devices are adopted into our everyday lives. The security of IOT is becoming more complex and may have a serious consequence. So, now we have many security challenges like privacy concerns, routine cryptography, passive data collection etc. Many people hide personal data in social media to eliminate these sort of privacy issues but common man nowadays is becoming a passive participant due to lack of security in these IOT devices that are surrounding us.

Keywords: DDOS (Distributed Denial of Service); GPS (Global Positioning system); IOT (Internet of things); MAM (Masked Authenticated Messaging)

1. Introduction

"The exponential proliferation of IOT and the way it's going to impact our future".

The proliferation and 'smartening' of IOT-driven devices is projected to achieve a market cap exceptional $195 billion in 2023, in keeping with analysts at reports. From a market of $16 billion in 2016, this growth is mainly powered by the progressively present manufacturing of smarter in-home, mobile, and transportation devices and the requirement to capture that knowledge and enhance communication infrastructure.

Fig 1: Prediction for Growth of IoT

proximity, acceleration, temperature, and motion will separate the industry leaders from the laggards.

2.2 Maintaining security is the main goal

With issues around cybersecurity, it conjointly remains to be seen however the business can influence each privacy and security. According to David Sandel, "Security can become additional responsibility because the sheer range of devices will increase. Some IOT applications may also contain confidential, time period patient info or would require a better quality of service, like deploying metropolitan wide space networks." Hence, with the exaggerated responsibility on IOT-driven information comes a replacement wave of privacy issues and a new reliance on stable communications infrastructure.

3.Hack data from sensors

The daily data fed by the sensors can be grabbed by the intruders by many methods like sound waves, apache camel, and custom software.

3.1. Through sound waves

Novel Perspective on Security And Privacy Mechanisms in Fog Computing

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Abstract— This paper sincerely attempts to summarize the current technological perspective of security challenges posed in the domain of fog computing. Our paper discusses the operational intricacies of security as well as privacy concern due to the highly flexible nature of fog nodes. In such an dynamic nature providing sustainable security requires quite a effort while designing the security principles. We have presented a novel review of existing techniques and also advocated a modified approach for access control. We have additionally presented the mechanism of authentication and privacy control for the fog users by deployment of trust management system.

Keywords—, Access Control, Authentication, Fog, IOT, Privacy, Security

I. INTRODUCTION

Fog computing is taken into account as associate extension of the cloud computing paradigm from the core of network to the sting of the network. it's an extremely virtualized platform that has computation, storage, and networking services between end devices and traditional cloud servers. Fog computing is defined as "a situation wherever a large range of different (wireless and generally autonomous) omnipresent and decentralized devices communicate and cooperate among them and with the network to perform storage and process tasks without the involvement of third parties. These tasks are for supporting basic network functions or new services and applications that run during a sandboxed atmosphere. Users leasing a part of their devices to host these services get incentives for doing therefore. Though this definition continues to be debatable, we have a tendency to powerfully agree that we want a definition to differ fog computing from connected technologies since

anyone of these underlying techniques could cover a false read on fog computing.

Fig. 1. Representing cloud and fog

Due to set at the edge of net, fog network is heterogeneous. The duty of fog network is to attach each element of the fog. However, managing such a network, maintaining connection and providing services upon that, particularly within the eventualities of the internet of Things (IoT) at massive scale, isn't simple.

II.SECURITY ASPECTS IN FOG

A. Authentication

Current trusty Platform Modules (TPMs) are ill suited for cross-device situations in trustworthy mobile applications as they hinder the seamless sharing of information across multiple devices.By design, TPMs provide a hardware root of-trust certain to one, standalone device. TPMs return equipped with secret writing keys whose private parts never leave the TPM hardware chip, reducing the chance those keys could also be compromised. the strain between single-device TPM guarantees and also the would like for cross-device sharing makes it tough for trustworthy applications to deal with multi-device eventualities. This paper reviews one, easy style amendment to the TPM,

Mist Computing: Principles, Trends and Future Direction

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Abstract — *In this paper we present the novel idea of computing near the edge of IOT architecture which enhances the inherent efficiency while computing complex applications. This concept is termed as mist computing. We believe this computing will bring about an massive revolution in future computing technologies. instead of thrusting the control responsibility to gateways while data transmission the control is decentralised to end nodes which decrease the communicational delay of the network thereby increasing the throughput.*

Keywords— *Mist, IOT, Gateway, Thinnect, Situation Aware, Edge Computing*

I. INTRODUCTION (SIZE 10 & BOLD)

Scaling IOT to 75 billion devices is quite a handful of challenges. One way is to utilise the computing power at the edge of the network. Secondly, for the sake of minimising communication, develop measures to contain the computation at the edge of the network. Last but not the least solutions to scaling must e self managing ad self configuring. MIST computing helps in building large scale IOT systems. The IOT is regarded to have very small things at the very edge of the network like little power, limited RAM,ROM, limited communication bandwidth and not surprisingly may organisations refrain themselves from facing this challenges. The following table indicates the current utilization of bandwidth by IOT devices:

TABLE I

	CSR mesh (QUALCOMM) Single hop configuration	Zigbee Pro(xi labs) 16 node network with high load	Thinnect mist 16 node network with high load
Average effective data rate (k/sec)	0.017	0.05	0.1
Duty cycle	50%	100%	20%

Even though the computing power is much more than what we had 10-15 years ago, the communication power is even much more than the computing power. We need 5 times more power to communicate with wireless devices. In case of a battery powered mesh network we have to communicate as little as possible to reduce the power consumption. For operation of IOT devices on the edge we need program memory size of 256kb and bandwidth of 250 Kbit/seconds. We infer easily that edge of IOT is not a scaled down version of the internet. So, while designing such a architecture we must account our needs before making the final design. The basic aim of mist computing is to rig computing to the very edge of the network ,i.e., sensors and actuators.IOT devices should not depend on internet as in real life ,physical systems won't be functional if there is a communication failure between the cloud ad the IOT device. The IOT devices should not have the capability to use the local intelligence using the guidelines that have been provided to act in case of a failure.

II. GUIDING PRINCIPLES OF MIST COMPUTING

2.1 Network must provide information but not simply data.

2.2 The network should deliver only information that has been requested and only when it has been requested.

2.3 Dynamic creation of a system based on information needs with end devices working together using a subscriber provider model.

2.4 Devices must be situation aware ,they must adapt to the information needs and the network configuration. We should not have static bindings rules for device and data providers. The devices must dynamically discover the data providers and execute the application.

A. Making Things Aware Of The Situation:

. The cloud and fog have awareness of the user needs and the global situation whereas the mist has awareness o the physical environment and the local situation, so together the responsibility is to execute an IOT application. In order to achieve this the global situation must be communicated to the edge devices and the edge devices must e ale to understand what does or how they need to behave in certain situations. The IOT application then actually spans from the very end of the edge network to the cloud. there are notable differences between edge computing ad mist computing. In edge computing, functionality is fixed,

Academic Science

Hybrid Training Mechanism for Training Neural Network to Perform Functional Testing of Software

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ABSTRACT

This paper is intended to introduce an efficient as well as robust training mechanism for a neural network which can be used for testing the functionality of software. The traditional setup of neural network architecture is used constituting the two phases -training phase and evaluation phase. The input test cases are to be trained in first phase and consequently they behave like normal test cases to predict the output as untrained test cases. The test oracle measures the deviation between the outputs of untrained test cases with trained test cases and authorizes a final decision. Our framework can be applied to system where number of test cases outnumbers the functionalities or the system under test is too complex. It can also be applied to the test case development when the modules of a system become tedious after modification.

KEYWORDS

ATNN, Fault, Neural, Test Case, Test Oracle

1. INTRODUCTION

In software testing what matters most is how much application conforms to specifications. In practice, agreement documents are indicators of the level to be accepted up to which the required functionality can be achieved. Software testing consumes substantial quantity of time as well as effort, so strategies have to be developed to carry out the functionality testing in a manner which is efficient in terms to deliver quality software with minimum effort & time. In past, Artificial Neural Networks (ANNs) were used to handle aspects of testing. ANNs are developed to mimic the structure and information processing powers of the human brain. The architectural components of a neural network are units same as the neurons of the brain. A neural network is formed from one or more layers of these neurons, the interconnections of which have associated synaptic weights. Each neuron in the network is able to perform calculations that contribute to the overall learning process, or training of the network. The neuron interconnections are associated with synaptic weights that store the information computed during the training of the network. It is rightly said that the neural network is a massive parallel information processing system which uses the distributed control to learn and store knowledge about its environment. Clearly, the two crucial factors that affect the superior computational capability of the neural network are its distributed design working in parallel layers and its ability to extrapolate the learned information to yield outputs for inputs not presented during training phase. These properties of the neural network allow multiple complex problems to be solved.

Data mining, pattern recognition, and function approximation are some of the tasks that can be handled by neural networks. In this paper, a design of Artificial Testing Neural Network (ATNN) is proposed to train on a suite of test cases developed manually. Sometimes manual test cases are found to have a greater degree of fault finding ability and this efficient element of manual test cases are used to train the test cases on a ATNN. The result is a set of superior or trained test cases which have the ability to find a fault in the functionality of the application in minimum time. If this approach is repeated over time, these trained test cases can show better fault finding ability over other programs under test.

Ambient Intelligence: Principles, Current Trends, Future Directions

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Abstract— In this paper we have presented the involved principles, trends, future directions of ambient intelligence. in the first section we have elucidated concept of ambient intelligence with the prevalent need of intelligent communication with the help of designing knowledgeable entities. We have presented the design process of I-blocks with its inherent merits. we have also discussed the various design concepts of ambient intelligence objects. Finally, we presented the current research directions to motivate societal needs of human beings.

Keywords— ambient, Computer Vision, intelligence; smart, ubiquitous

I. INTRODUCTION

This introductory paper describes Ambient Intelligence *(AmI)* from the perspectives of researchers working in the field of Artificial Intelligence and Computer Vision. It is for the reader to get acquainted with some of the ideas .That will be explored in greater detail in the following content .Ambient Intelligence is a term that was introduced by the European community to identify a paradigm to equip environments with advanced technology and computing to create an ergonomic space for the occupant user. Here the term ergonomic is used in a broad sense, encompassing both better living environment, secure space, but also an active, almost living space around us; capable of aiding us with daily chores and professional duties. Later on in this paper you will be able to see examples of enhanced homes for the elderly, intelligent buildings, devices built for education and entertainment and conventional visual surveillance systems, easily portable to other domains of application, such as the training of professionals.

The AmI paradigm can be realized only through a number of technologies, all involving modern computing hardware and software. In particular, an AmI system requires the use of distributed sensors and actuators to create a pervasive technological layer, able to interact transparently with a user, either passively by observing and trying to interpret what the user actions and intentions are, but also actively, by learning the preferences of the user and adapting the system parameters to improve the quality of life and work of the occupant.

The Essex approach-The Department of Computer Science at Essex University carries out research in the field of AmI. Their approach is focused on the implementation of AmI as indoors smart environments. In particular, state of the art Artificial Intelligence techniques are employed in the implementation of a futuristic *IntelligentDormitory* (iDorm). The following contents will describe their approach and some of the employed technology. The main idea here is to illustrate a concrete example of AmI put into practice with success. Later on in this paper you will be able to understand how Computer Vision could enhance the iDorm and typical AmI enabled smart environments.

II. CURRENT TRENDS

Ambient Intelligence: the contribution of different disciplines

Ambient Intelligence represents a vision of the future where people are surrounded by electronic artifacts and environments, sensitive and responsive. Ambientintelligence technologies are expected to combine concepts of ubiquitouscomputing and intelligent systems putting humans in the centre of technologicaldevelopments. This represents a long-term objective for European researchbringing together researchers across multiple disciplines like computer science, electronics and mechanical engineering, design, architecture, social sciences,software engineering. Key concepts of ambient intelligence are:

A. *Ubiquitous Computing*: that is wired, wireless and ad-hoc networkingthat exploit highly portable or else numerous, very-low-cost computingdevices; discovery mechanisms, software architectures, system integrationand prototyping, portable devices;

Amalgamation of Ant Colony Optimization and Cuckoo Search for Regression Test Case Prioritization

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Abstract: Regression testing in software ensures that functionality of the software does not change after bug fixing operation has been done .so only selected test cases need to be executed from a test suite. In this paper we integrate the essential characteristics of ant colony optimization technique with features of cuckoo search method to design a regression test case execution sequence so that a test case of higher prioritization gets executed first when testing time is limited there by mitigation risk of reduced testing effort (or) cost for the testing team. ACO provides a single optimization factor which can be used to reorder the priority of test cases and cuckoo search performs search in local space with considerable amount of efficiency. We model our algorithm to rank the test cases by combinatorial optimizations of each test case sequence by having a common framework while performing regression testing.

Keywords: ACO, cuckoo search regression, APFD, Test case dependency.

I. INTRODUCTION

Due to ever changing code while manufacturing software, more effort while testing is inevitable. Regression testing is necessary because after due modifications or enhancements are done on the modules probability of failure of functionality creeps in. so to verify that program correctness regression testing is carried out. Regression testing can be performed either by retesting all old test cases or by regression test case selection prioritization on of regression test cases reduces testing time effort thereby giving more time to quality engineers to focus on other software quality assurance activities retesting is expensive due to the obvious reasons of time resource consumption so our paper concentrates on technique which employs logic present in bio inspired algorithm instead of execution of all test cases it is always better to divide the test cases into classes one class will contain test cases which have nothing to do with that part of software module which underwent changes. Such test cases are termed as absolute test cases for regression testing and they can be rejected outright. so the other class of test cases are the reusable test cases which were previously executed on modules which now underwent changes, so in succeeding testing they have to be selected .now we face the challenge selection of test cases in regression test cycles have always been a challenge in software industry from considerable sources in software industry ,it was found that large chunk of defects reported by users were due to predominantly one reason, last minute bug fixes which created side effects .Hence, we can uprightly say that selection of regression test cases is not easy considering a bunch of factors effecting the test cases selection.

The factors which are contenders for this are depending on business impact, how frequently functionality is used .our paper models test prioritization mechanism considering few assumption in a broad manner while selecting the test cases. the first assumption is all regression test cases are reproducible second assumption is all regression test cases have same nature of complexity and they are capable of verifying the core features of the software application .Third assumption is test coverage is constant for all modules.

Most of the researchers have used met heuristic algorithm belonging to the class of nature inspire algorithm .so; we too have followed the same. In particular we have selected the ant colony optimization (ACO) and cuckoo search (CS) algorithms. For ACO optimization we have chosen APFD(average percentage of fault detected) as metric and for cuckoo search ,fitness value do similar nature is considered .the reason behind choosing met heuristics algorithm like ACO,CS is that they work from a local level optimization to global level optimization .this is the main advantage over stochastic algorithm like stimulated –annealing. Then objective function using metaheuristic algorithm can be optimized with greater rate of efficiency in minimum amount of time .regression test case prioritization is depicted as an optimization problem to obtain effective results in reduced time, so we are employing hybrid algorithms for achieving our aim. The brood parasitism of cuckoo species is effectively amalgamated with the ant colony optimization technique to deliver a regression test suite which not only is efficient in terms of covering all strong test metrics but also saves substantial amount of testing time.

II. PROPOSED AMALGAMATION ALGORITHM

Our mechanism integrates benefits of ACO cuckoo search the drawback which ACO carries is notable in the since that is slow due to fact that the ant walks through the path where more amount of pheromone has been laid. To counter this issues, cuckoo search is used which creates collection of objects with best optimized cost. In our technique, objects are test cases and cost is testing time.

Step 1: Initialization of the testing environment

Step 2: Determine the total count of test cases need to be regression tested call it T_n

Step 3: schedule the test cases in order using the Amalgamation algorithm

Step 4: Find out if all test cases, T_n are in prioritized order.

A Comprehensive Survey on Real Time Application of Paxos Algorithm

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Abstract- In a network of unreliable processors ,Paxos protocol provides consensus when failure between communicating entities occur. The Paxos family of protocols contains a variety of trade-offs among the number of processors, number of message delays before learning the agreed value, the activity level of individual participants, number of messages sent, and types of failures. Even though no specific fault-tolerant consensus protocol can ensure progress in an asynchronous network, Paxos provides safety (consistency), and the conditions that could prevent it from making progress are difficult to provoke. Paxos is generally used where durability is required (for instance, to mimic a file or a database), in which the size of durable state could be voluminous. The protocol attempts to make development even during time intervals when some limited number of replicas are unresponsive. There is also a strategy in place for dropping a permanently failed replica or to add a new replica. Our study in this paper brings light on few real time applications of this protocol in current technological era.

Keywords- Autopilot, Chubby, Doozerd, Neo4j, Paxos

I. INTRODUCTION

The architecture defines a peer-to-peer consensus protocol that is based on simple majority rule and which is capable of establishing that one and only one out coming value can be accomplished. Paxos is a group of protocols for solving consensus in a network of dependable processors. Consensus is the process of electing one member among a group of people. State machine replication is an approach for modifying an algorithm into a fault-tolerant, distributed application. It is simple for replicas to execute client commands in the same order and hover in sync if there is only one client or if various clients send their requests in a subsequent order. If various clients send requests to replicas at a time, then different replicas might get these requests in different orders and execute the commands in different orders, causing their provincial states to diverge from one another over time. To avoid replicas from diverging in the presence of various

commands will be executed by replicas should be determined. To determine the order we use various subsequent slots.

Replicas attach the requests sent by clients to specific slots, creating a chain of commands but various replicas may end up proposing various commands for the same slot. To avert inconsistency, a consensus protocol chooses a single command from the proposals for every slot. In Paxos the sub-protocol that implements consensus is called the multi-decree Synod protocol, or simply Synod protocol. A replica waits for the decision before actually renovating its chain of commands in the table, executing the next command and figuring out a response to send back to the client that sent the request.

Origin:

Paxos was developed by Leslie Lamport. Paxos has strong resemblance to a protocol used for agreement in viewstamped replication, introduced by Oki and Liskov in 1988, in the context of distributed transactions. The Paxos algorithm for consensus in a information-passing system was first described by Lamport in 1990 in a tech report. Lamport at last published the paper 8 years later in 1998 after it was written in 1990 with the name: "The Part-Time Parliament". But people were not able to understand this paper which made Lamport to write another paper in a simple english with the name: "Paxos Made Simple". Still, the algorithm is not up to the mark to understand easily which made people to start writing papers and lecture notes to explain "Paxos Made Simple." For example "Paxos Made Moderately Complex", "Paxos Made Practical", etc.

EX: How do people agree on something?
  – Question: shall we watch a movie?
  – Input: the answer said by everyone will be either yes/no.
  – Output: yes or no.
  – FLP(Fischer-Lynch-Paterson): this is not possible even with one-faulty process and irrational delays.

The name FLP was given because the output was established by Fischer-Lynch-Paterson. The result shows that there are no proper algorithm that solves consensus in an asynchronous

Efficient Resource Allocation Algorithm in Dependable Distributed Computing Systems Using A Colony Optimization

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Abstract— In this paper we present efficient resource allocation algorithm which give rise to economic models for job scheduling in distributed computing environmental. Existing schemes which schedule jobs in such a environment have their routes in searching of time slots in resource occupancy schedules which consider only the time slot sets. Our algorithm proposes a hybrid time slot search algorithm and configures each job in an efficient schedule.

Index Terms— Distributed, Reliability System, Ant Colony Optimization, Multi Criteria Decision

I. INTRODUCTION

Distributed computing is a model in which components of software systems are shared among multiple computers to improve efficiency and performance. The configuration of a distributed computing system involves a set of cooperating processors communicating over the communication links to maximize the outcomes and to reduce the consumption of time the process is allocated to nearby processor for fast response by using ACO. This will decreases the fault tolerance by allocating resources. distributed computing architecture consists of a number of client machines with very lightweight software agents installed with one or more distributed computing management servers (DCMS) the agents running on the client machine usually checks for the idle system and send notification to the management server that the system is not in use and available for processing job .the agents then requests an application software packages .whenever the client receives the package from DCMS it start processing when cpu cycles are free and send the result back to the DCMS when user returns the resource is allocated to some other agents like food is completed ant chooses other location in the same if same user requires resource once again then it again checks for the availability of the other resources and process the Information for acknowledgement but it does not checks for optimal path this is solved by choosing most effective ANT COLONY OPTIMIZATION ALGORITHM(ACO).

Among others, system cost and reliability are two of the most concerned objectives to improve the performance of the distributed system .In this execution cost place major role

from its allocated processor. This is done by the ACO as described below in order to provide solution.

The following is the in detail regarding the problem. The task is to process allocation that minimizes the system cost and maximizes the system reliability which leads to DRS(Distributed reliability System) for better understanding network topology is render it uses the graph to indicate the processor interaction graph (PIG).

P-processor
L-communication links
G(P,L)
$P= \{p_i\}_{i=1,2,3,4....n}$
$L= \{LF_i\}_{i=1,2,3,....n}$

For better resources allocation mesh topology is used to indicate the graph .The nodes represent communication links.

II. PRINCIPLE

Consider a job j_i which has to be scheduled on a CPU p_i whenever p_i accepts j_i its load compared to previous processing load increases. We introduced a load factor l_f which indicates amount of load present currently on a processor. The following illustration expands the principle involved.

Load Factor	Processor	Jobs
Lf_1	P_1<-----------------------------	J_1
Lf_2	P_2<-----------------------------	J_2
Lf_3	P_3<-----------------------------	J_3
Lf_4	P_4<-----------------------------	J_4

In case after time t, j_2, j_3 are also assigned to p_1 then Lf_2, Lf_3 becomes Zero and Lf for p_1 is now $Lf_1 + Lf_2 + Lf_3$

Research Roadmap for IoT Forensics

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ABSTRACT

With the advent of IOT ,most of modern technological devices consume and dissipate data at a level never imagined .It has been admitted by IOT researchers that usage of data trails can be used to provide evidence in court of law for safeguarding the common man's interests. our paper is a sincere effort to throw light on current principles applied for IOT forensics as well as difficulties faced by researchers in this field. This paper is a readymade guide for understanding the crucial research challenges lying ahead in the field of IoT forensics. In this paper we present the issues pertaining to IOT forensics which force us to think about leveraging the current techniques used in digital forensics, cloud forensics, network forensics.

Keywords : IoT, Digital Forensics, Cloud Forensics , anonymisation techniques, Digital Investigations

I. INTRODUCTION

What is IoT

Imagine a world in which every device in the home, workplace and car are connected. A world where the lights automatically turn on when the car approaches the driveway, the coffee starts brewing when the morning alarm goes off and the front door automatically unlocks when approached by a member of the household, but stays locked when a stranger arrives on the front step. That is the type of world the Internet of Things can create.

The Internet of things (IoT) is the inter-networking of physical devices, vehicles (also referred to as "connected devices" and "smart devices"), buildings, and other items—embedded with electronics, software, sensors, actuators, and network connectivity that enable these objects to collect and exchange data.

Internet of Things (IoT) is an ecosystem of connected physical objects that are accessible through the internet. The 'thing' in IoT could be a person with a heart monitor or an automobile with built-in-sensors, i.e. objects that have been assigned an IP address and have the ability to collect and transfer data over a network without manual assistance or intervention. The embedded technology in the objects helps them to interact with internal states or the external environment, which in turn affects the decisions taken.

IoT is to offers advanced connectivity of devices, systems, and services that goes beyond machine-to-machine (M2M) communications and covers a variety of protocols, domains, and applications. The interconnection of these embedded devices (including smart objects), is expected to usher in automation in nearly all fields, while also enabling advanced applications like a smart grid, and expanding to areas such as smart cities.

Currently, the focus in the IoT domain centers on its benefits and applications as well as security and privacy issues that apply. There is little by way of a dedicated incident response methodology for Digital Forensics (DF)

Fluid computing: Principles, Applications, Future Directions

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ABSTRACT

Pervasive computing is the next level of computing in modern technological era where user is much bothered about the flexibility of working on an application without having to bother about the nature of devices. The user may change the devices according to his portable needs and the handoff of the application state must be near perfect. To achieve this near perfect synchronization the concept of fluid computing and its implementation resulting into a robust middle architecture forms the main crux of our paper. We present the basic fundamentals needed to under the fluid computing concept and its applications which are already sparking off an revolution in wireless technological world.

Keywords: Batch mode , Fluid Computing, Handoff, Trickle mode, Synchronization

I. INTRODUCTION

As the advent of distributed systems brings about never imagined advancements still mankind hopes for a better technology at its dispense. Few years back cloud computing paradigm had taken the whole world by storm with its infinite ability it provides various services on demand. With its boon for virtualization a well secured architecture was put into practice. the essential properties of cloud namely on-demand self-service, broad network access, resources-pooling, rapid elasticity, measured services more talking point of every potential cloud user But due to security issues while cloud data storage a shift to new technology paradigm called as "fog computing; came into existence. In fog computing also known as edge computing, proximity of data to end users is more .It is medium in terms of computing power. as said the inherent scope of development still exists which has given birth to mist computing which refers to a lightweight and primitive form of computing power which resides directly inside the network fabric consisting of microcomputer and micro controllers to feed into fog nodes thus the fog nodes are responsible to inject the same forward cloud computing platform. Mist, fog computing are emerging as contenders against cloud in terms of connectivity bandwidth, latency, cost & security challenges imposed by cloud architectures. So far everything was seemingly alright but human nature of operational simplicity forced, towards a principle of distributed computing architecture where design was to achieve most cost effective, reliable, scalable architecture which was never possible before, The operating technology was coined a term "fluid" and fluid computing become famous from last couple of years.

II. LITERATURE SURVEY

2.1 Chisel

Adaptable software for varying contexts was a challenge met by researches when they produced a dynamic framework named chisel[1] .chisel worked on the principle of adaptation of changing work execution environmental taking inputs

IOT Security Challenges and Measures to Mitigate: Novel Perspectives

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Abstract

The Internet Of Things describes the ever-growing number of intelligent objects that are being connected to the internet and each other, smartphones, tablets, wearable technology and smart home devices are adopted into our everyday lives. The security of IOT is becoming more complex and may have a serious consequence. So, now we have many security challenges like privacy concerns, routine cryptography, passive data collection etc. Many people hide personal data in social media to eliminate these sort of privacy issues but common man nowadays is becoming a passive participant due to lack of security in these IOT devices that are surrounding us.

1. Introduction

"The exponential proliferation of IOT and the way it's going to impact our future".

The proliferation and 'smartening' of IOT-driven devices is projected to achieve a market cap exceptional $195 billion in 2023, in keeping with analysts at reports. From a market of $16 billion in 2016, this growth is mainly powered by the progressively present manufacturing of smarter in-home, mobile, and transportation devices and the requirement to capture that knowledge and enhance communication infrastructure.
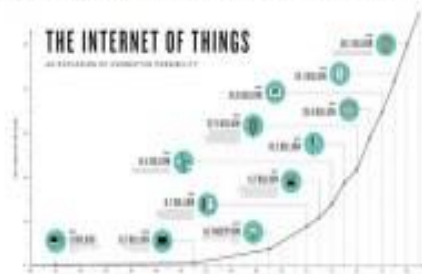

Fig 1: Prediction for Growth of IoT

proximity, acceleration, temperature, and motion will separate the industry leaders from the laggards.

2.2 Maintaining security is the main goal

With issues around cybersecurity, it conjointly remains to be seen however the business can influence each privacy and security. According to David Sandel, "Security can become additional responsibility because the sheer range of devices will increase. Some IOT applications may also contain confidential, time period patient info or would require a better quality of service, like deploying metropolitan wide space networks." Hence, with the exaggerated responsibility on IOT-driven information comes a replacement wave of privacy issues and a new reliance on stable communications infrastructure.

3.Hack data from sensors

The daily data fed by the sensors can be grabbed by the intruders by many methods like sound waves, apache camel, and custom software.

3.1. Through sound waves

Future Research Directions in Crowd Computing: A Novel Perspective

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Abstract: This paper discusses areas where crowd computing needs attention to optimize crowd resources as well as increase the efficiency of crowd computing. We explore only three horizons namely user modeling,labels integration, sample selection. We observe that each one is a research area in its own where work has been progressing at appreciable rate.But they are open issues, so scope of improvement exists in all the areas of crowd computing. Our paper is a sincere attempt to bring out the shortcomings of current strategies used in development of crowd computing applications. This paper will serve as a readymade guide for researchers who attempt to treadin the path of crowd computing research.

Keywords: Crowd sourcing, Crowd computing, model selection, label classification, uncertainty.

I.   INTRODUCTION

Human beings are capable of solving non-algorithmic issues. Crowd computing approach exploits this strength where computers cannot perfectly solve the problem. Human group can efficiently solve few areas of computing where machine intelligence cannot outperform humans. Humans perception in certain issues have better approach which cannot be installed in computer systems due to natural behaviour of human beings. The term crowd sourcing was advocated by Jeff Home in the year 2006. The operating principle is simple. A group of people are asked to perform a task to contribute to a complex task which cannot be finished by a single person. For instance, Wikipedia which is one of the most popular crowd-computing system where daily millions of users are contributing to the content on various topics all over the world. There are many benefits of crowd-computing. Business organisations reap innumerable benefits from users feedback to improve their services. Classical AI systems have some inherent shortcomings. For example, the optical character recognition (OCR) perform poorly when it comes to low quality of characters. Using crowd-computing recaptcha system is built to serve the purpose . Two different OCR systems are used along with a reference directory to achieve a valid authentication. According to experimental results by Newyork Times Archive, the Recaptcha system acheived 99% precision against 84% of standard OCR systems. One of the remarkable thing of RecaPtcha system is that the crowd does not charge any money for their effort in completing the task. Yet another significant crowd computing marketplace is Amazon Mechanical Turk(MTurk). It has Provision for API's for developers so that the developers can directly connect to MTurk servers to efficiently finish the computing task. MTurk largely popular due to large number of members ,high-diversity of member's knowledge , locations ,skills along with low-cost labors. The rapid cycle of deployment and testing also matters. Crowd-computing applications should solve problems which have following characteristics. First of all problem divisibility. The problem should be divisible into non dependant sub Problems. They should not change with time. The sub Problems when solved should result into sub-solution which should be in a verifiable state. There should be a strategy that should b efficient enough to integrate sub solutions into solution to the original-Problem. second characteristic is cost of crowd-computing should be reasonable . A crowd size limited to few users who are expert in solving a specific computing problem will increase the cost inevitably. Hence this characteristic should be kept in mind while modelling a crowd-computing scenario . Numerous applications in recent years used this crowed sourcing-approach : Music similarity evaluation , Improvement in text - writing ,Measurement of relevance of results by search engines, Construction of training datasets of audio ,video, images for classic AI systems. There are 3 design steps for designing a crowd-computing system. They are : defining system overall strategy , generation of sub problems designing & optimising process . In crowd-computing, it's a good

Robust Fault-Tolerant Training Strategy Using Neural Network to Perform Functional Testing of Software

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--ABSTRACT--

This paper is intended to introduce an efficient as well as robust training mechanism for a neural network which can be used for testing the functionality of software. The traditional setup of neural network architecture is used constituting the two phases -training phase and evaluation phase. The input test cases are to be trained in first phase and consequently they behave like normal test cases to predict the output as untrained test cases. The test oracle measures the deviation between the outputs of untrained test cases with trained test cases and authorizes a final decision. Our framework can be applied to systems where number of test cases outnumbers the functionalities or the system under test is too complex. It can also be applied to the test case development when the modules of a system become tedious after modification.

I. INTRODUCTION

In software testing what matters most is how much application conforms to specifications. In practice, agreement documents are indicators of the level to be accepted up to which the required functionality can be achieved. Software testing consumes substantial quantity of time as well as effort, so strategies have to be developed to carry out the functionality testing in a manner which is efficient in terms to deliver quality software with minimum effort & time. In past, Artificial Neural Networks (ANNs) were used to handle aspects of testing. ANNs are developed to mimic the structure and information processing powers of the human brain. The architectural components of a neural network are units same as the neurons of the brain. A neural network is formed from one or more layers of these neurons, the interconnections of which have associated synaptic weights. Each neuron in the network is able to perform calculations that contribute to the overall learning process, or training of the network. The neuron interconnections are associated with synaptic weights that store the information computed during the training of the network. It is rightly said that the neural network is a massive

Data mining, pattern recognition, and function approximation are some of the tasks that can be handled by neural networks. In this paper, a design of Artificial Testing Neural Network (ATNN) is proposed to train on a suite of test cases developed manually. Sometimes manual test cases are found to have a greater degree of fault finding ability and this efficient element of manual test cases are used to train the test cases on a ATNN. The result is a set of superior or trained test cases which have the ability to find a fault in the functionality of the application in minimum time. If this approach is repeated over time, these trained test cases can show better fault finding ability over other programs under test.

II. EXISTING WORK

Domain based testing models already exist which predicts faults taking into account fault exposing metrics which are traditional in nature. Tools like SLEUTH use this model for purpose of effective test suite generation with the help of test case metrics, a synthetic test oracle judge's individual test case for error classification. The neural network is imparted training on test metric input sequence and maps them to the test oracle's error classification system. Once trained, the network acts as a test case

A Survey of Cyber foraging systems: Open Issues, Research Challenges

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--ABSTRACT--

This paper presents a survey on current applications which practice the pervasive mechanism of cyber foraging. The applications include the LOCUSTS framework, Slingshot, Pupetter. This applications advocated the operating principle of task sharing among resource deficient mobile devices. These applications face some design issues for providing efficient performance like task distribution and task migration apart from the security aspect. The general operating mechanism of the cyber foraging technique are also discussed upon and the design options to leverage the throughput of the inherent mechanism is also represented in a suitable way.

I. INTRODUCTION

Cyber foraging refers to pervasive computing mechanism where resource deficient, mobile devices offload some of their heavy task to stronger surrogate machines in the surroundings. The term cyber foraging was given by Mr.   M. Satyanarayanan in his 2001 paper. Cyber foraging, helps the mobile devices to take on more resource intensive tasks by leveraging unused resources on larger computers in the vicinity. Cyber foraging is foraging for a multiple   resource types   , not limited to processing power. Among the resources that can   be foraged for is network connectivity, storage, processing power, bandwidth and much more. All of these resource types are equally important in a cyber foraging scenario. There are many possible usage scenarios where cyber foraging can be utilized. Some designs for pervasive computing advocates for wearable computing devices which include small computing devices that may be worn by their users like clothes[1]. Users of such devices are not interested in carrying around equipment which are heavy, and these devices must therefore be as lightweight as possible. This is opposite to the user's need   to have as powerful a device as possible. The desired computing power can be added to these small wearable devices through techniques such as cyber foraging. Consider the following situation   : a doctor doing house calls is wearing a small headset (similar in size and form to the well-known Bluetooth headsets for mobile phones). Using

some of the recordings to these machines who respond by returning the translated text[2]. In case the surrogate has an Internet connection it may even be given the task of updating the patient's journal directly. After translation the headset may discard the recording and thus free storage for additional recordings. In the preceding scenario   the application running on the mobile device works in two modes; high fidelity and low fidelity. When no surrogates are within range the headset simply saves the recordings (low fidelity), and when surrogates can be used the recordings are immediately translated into text (high fidelity). This high/low fidelity aspect is inherent in all cyber foraging applications, when surrogates are available high quality work may be done, but this does not mean that the applications will only work in the presence of surrogates. For cyber foraging to be usable a low fidelity setting must also be possible, where the mobile device itself is running the application, but   at a diminished fidelity. In the scenario low fidelity means that the headset only stores the recordings, but it would also be possible to ask the mobile device to do the processing itself, or even to do it in combination with other mobile devices that reside in the doctors personal area network. To be able to perform the actions described above a number of things are needed. At first the mobile device must be able to monitor the network looking for any available surrogates[3]. Once found the mobile device must be able to distribute tasks to surrogate machines, and, in the case that the user is moving while tasks are being performed,

Ambient Intelligence: Principles, Current Trends, Future Directions

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Abstract— In this paper we have presented the involved principles, trends, future directions of ambient intelligence. in the first section we have elucidated concept of ambient intelligence with the prevalent need of intelligent communication with the help of designing knowledgeable entities. We have presented the design process of I-blocks with its inherent merits. we have also discussed the various design concepts of ambient intelligence objects. Finally, we presented the current research directions to motivate societal needs of human beings.

Keywords— ambient, Computer Vision, intelligence; smart, ubiquitous

I. INTRODUCTION

This introductory paper describes Ambient Intelligence *(AmI)* from the perspectives of researchers working in the field of Artificial Intelligence and Computer Vision. It is for the reader to get acquainted with some of the ideas .That will be explored in greater detail in the following content .Ambient Intelligence is a term that was introduced by the European community to identify a paradigm to equip environments with advanced technology and computing to create an ergonomic space for the occupant user. Here the term ergonomic is used in a broad sense, encompassing both better living environment, secure space, but also an active, almost living space around us; capable of aiding us with daily chores and professional duties. Later on in this paper you will be able to see examples of enhanced homes for the elderly, intelligent buildings, devices built for education and entertainment and conventional visual surveillance systems, easily portable to other domains of application, such as the training of professionals.

The AmI paradigm can be realized only through a number of technologies, all involving modern computing hardware and software. In particular, an AmI system requires the use of distributed sensors and actuators to create a pervasive technological layer, able to interact transparently with a user, either passively by observing and trying to interpret what the user actions and intentions are, but also actively, by learning the preferences of the user and adapting the system parameters to improve the quality of life and work of the occupant.

*The Essex approach-*The Department of Computer Science at Essex University carries out research in the field of AmI. Their approach is focused on the implementation of AmI as indoors smart environments. In particular, state of the art Artificial Intelligence techniques are employed in the implementation of a futuristic *IntelligentDormitory* (iDorm). The following contents will describe their approach and some of the employed technology. The main idea here is to illustrate a concrete example of AmI put into practice with success. Later on in this paper you will be able to understand how Computer Vision could enhance the iDorm and typical AmI enabled smart environments.

II. CURRENT TRENDS

Ambient Intelligence: the contribution of different disciplines

Ambient Intelligence represents a vision of the future where people are surrounded by electronic artifacts and environments, sensitive and responsive. Ambientintelligence technologies are expected to combine concepts of ubiquitouscomputing and intelligent systems putting humans in the centre of technologicaldevelopments. This represents a long-term objective for European researchbringing together researchers across multiple disciplines like computer science, electronics and mechanical engineering, design, architecture, social sciences,software engineering. Key concepts of ambient intelligence are:

A. *Ubiquitous Computing*: that is wired, wireless and ad-hoc networkingthat exploit highly portable or else numerous, very-low-cost computingdevices; discovery mechanisms, software architectures, system integrationand prototyping, portable devices;

A Comprehensive Survey on Real Time Application of Paxos Algorithm

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Abstract- In a network of unreliable processors ,Paxos protocol provides consensus when failure between communicating entities occur. The Paxos family of protocols contains a variety of trade-offs among the number of processors, number of message delays before learning the agreed value, the activity level of individual participants, number of messages sent, and types of failures. Even though no specific fault-tolerant consensus protocol can ensure progress in an asynchronous network, Paxos provides safety (consistency), and the conditions that could prevent it from making progress are difficult to provoke. Paxos is generally used where durability is required (for instance, to mimic a file or a database), in which the size of durable state could be voluminous. The protocol attempts to make development even during time intervals when some limited number of replicas are unresponsive. There is also a strategy in place for dropping a permanently failed replica or to add a new replica. Our study in this paper brings light on few real time applications of this protocol in current technological era.

Keywords- Autopilot, Chubby, Doozerd, Neo4j, Paxos

I. INTRODUCTION

The architecture defines a peer-to-peer consensus protocol that is based on simple majority rule and which is capable of establishing that one and only one out coming value can be accomplished. Paxos is a group of protocols for solving consensus in a network of dependable processors. Consensus is the process of electing one member among a group of people. State machine replication is an approach for modifying an algorithm into a fault-tolerant, distributed application. It is simple for replicas to execute client commands in the same order and hover in sync if there is only one client or if various clients send their requests in a subsequent order. If various clients send requests to replicas at a time, then different replicas might get these requests in different orders and execute the commands in different orders, causing their provincial states to diverge from one another over time. To avoid replicas from diverging in the presence of various clients sending requests at a time, the order in which the client

commands will be executed by replicas should be determined. To determine the order we use various subsequent slots.

Replicas attach the requests sent by clients to specific slots, creating a chain of commands but various replicas may end up proposing various commands for the same slot. To avert inconsistency, a consensus protocol chooses a single command from the proposals for every slot. In Paxos the sub-protocol that implements consensus is called the multi-decree Synod protocol, or simply Synod protocol. A replica waits for the decision before actually renovating its chain of commands in the table, executing the next command and figuring out a response to send back to the client that sent the request.

Origin:

Paxos was developed by Leslie Lamport. Paxos has strong resemblance to a protocol used for agreement in viewstamped replication, introduced by Oki and Liskov in 1988, in the context of distributed transactions. The Paxos algorithm for consensus in a information-passing system was first described by Lamport in 1990 in a tech report. Lamport at last published the paper 8 years later in 1998 after it was written in 1990 with the name: "The Part-Time Parliament". But people were not able to understand this paper which made Lamport to write another paper in a simple english with the name: "Paxos Made Simple". Still, the algorithm is not up to the mark to understand easily which made people to start writing papers and lecture notes to explain "Paxos Made Simple." For example "Paxos Made Moderately Complex", "Paxos Made Practical", etc.

EX: How do people agree on something?
 – Question: shall we watch a movie?
 – Input: the answer said by everyone will be either yes/no.
 – Output: yes or no.
 – FLP(Fischer-Lynch-Paterson): this is not possible even with one-faulty process and irrational delays.

The name FLP was given because the output was established by Fischer-Lynch-Paterson. The result shows that there are no proper algorithm that solves consensus in an asynchronous environment with strong channels if a single process may crash. This is because of the fact that in an asynchronous

Research Roadmap for IoT Forensics

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ABSTRACT

With the advent of IOT ,most of modern technological devices consume and dissipate data at a level never imagined .It has been admitted by IOT researchers that usage of data trails can be used to provide evidence in court of law for safeguarding the common man's interests. our paper is a sincere effort to throw light on current principles applied for IOT forensics as well as difficulties faced by researchers in this field. This paper is a readymade guide for understanding the crucial research challenges lying ahead in the field of IoT forensics. In this paper we present the issues pertaining to IOT forensics which force us to think about leveraging the current techniques used in digital forensics, cloud forensics, network forensics.

Keywords : IoT, Digital Forensics, Cloud Forensics , anonymisation techniques, Digital Investigations

I. INTRODUCTION

What is IoT

Imagine a world in which every device in the home, workplace and car are connected. A world where the lights automatically turn on when the car approaches the driveway, the coffee starts brewing when the morning alarm goes off and the front door automatically unlocks when approached by a member of the household, but stays locked when a stranger arrives on the front step. That is the type of world the Internet of Things can create.

The Internet of things (IoT) is the inter-networking of physical devices, vehicles (also referred to as "connected devices" and "smart devices"), buildings, and other items—embedded with electronics, software, sensors, actuators, and network connectivity that enable these objects to collect and exchange data.

Internet of Things (IoT) is an ecosystem of connected physical objects that are accessible through the internet. The 'thing' in IoT could be a person with a heart monitor or an automobile with built-in-sensors, i.e. objects that have been assigned an IP address and have the ability to collect and transfer data over a network without manual assistance or intervention. The embedded technology in the objects helps them to interact with internal states or the external environment, which in turn affects the decisions taken.

IoT is to offers advanced connectivity of devices, systems, and services that goes beyond machine-to-machine (M2M) communications and covers a variety of protocols, domains, and applications. The interconnection of these embedded devices (including smart objects), is expected to usher in automation in nearly all fields, while also enabling advanced applications like a smart grid, and expanding to areas such as smart cities.

Currently, the focus in the IoT domain centers on its benefits and applications as well as security and privacy issues that apply. There is little by way of a dedicated incident response methodology for Digital Forensics (DF)

Fluid computing: Principles, Applications, Future Directions

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ABSTRACT

Pervasive computing is the next level of computing in modern technological era where user is much bothered about the flexibility of working on an application without having to bother about the nature of devices. The user may change the devices according to his portable needs and the handoff of the application state must be near perfect. To achieve this near perfect synchronization the concept of fluid computing and its implementation resulting into a robust middle architecture forms the main crux of our paper. We present the basic fundamentals needed to under the fluid computing concept and its applications which are already sparking off an revolution in wireless technological world.

Keywords: Batch mode , Fluid Computing, Handoff, Trickle mode, Synchronization

I. INTRODUCTION

As the advent of distributed systems brings about never imagined advancements still mankind hopes for a better technology at its dispense. Few years back cloud computing paradigm had taken the whole world by storm with its infinite ability it provides various services on demand. With its boon for virtualization a well secured architecture was put into practice. the essential properties of cloud namely on-demand self-service, broad network access, resources-pooling, rapid elasticity, measured services more talking point of every potential cloud user But due to security issues while cloud data storage a shift to new technology paradigm called as "fog computing; came into existence. In fog computing also known as edge computing, proximity of data to end users is more .It is medium in terms of computing power. as said the inherent scope of development still exists which has given birth to mist computing which refers to a lightweight and primitive form of computing power which resides directly inside the network fabric consisting of microcomputer and micro controllers to feed into fog nodes thus the fog nodes are responsible to inject the same forward cloud computing platform. Mist, fog computing are emerging as contenders against cloud in terms of connectivity bandwidth, latency, cost & security challenges imposed by cloud architectures. So far everything was seemingly alright but human nature of operational simplicity forced, towards a principle of distributed computing architecture where design was to achieve most cost effective, reliable, scalable architecture which was never possible before, The operating technology was coined a term "fluid" and fluid computing become famous from last couple of years.

II. LITERATURE SURVEY

2.1 Chisel

Adaptable software for varying contexts was a challenge met by researches when they produced a dynamic framework named chisel[1] .chisel worked on the principle of adaptation of changing work execution environmental taking inputs

Application of multi factor comparison model to populate the trending videos from cross domain

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ABSTRACT

A Predicting the top-N popular videos and their future views for a large batch of newly uploaded videos is of great commercial value to online video services (OVSs). Although many attempts have been made on video popularity prediction, the existing models has a much lower performance in predicting the top-N popular videos than that of the entire video set. The reason for this phenomenon is thatmost videos in an OVS system are unpopular, so models preferentially learn the popularity trends of unpopular videos to improve their performance on the entire video set. However, in most cases, it is critical to predict the performance on the top-N popular videos which is the focus of this study. The challenge for the task are as follows. First, popular and unpopular videos may have similar early view patterns. Second, prediction models that are overly dependent on early view patterns limit the effects of other features. To address these challenges, we propose a novel multifactor differential influence (MFDI) prediction model based on multivariate linear regression (MLR). The model is designed to improve the discovery of popular videos and their popularity trends are learnt by enhancing the discriminative power of early patterns for different popularity trends and by optimizing the utilization of multi-source data. We evaluate the proposed model using real-world YouTube data, and extensive experiments have demonstrated the effectiveness of our model. Index Terms—Popularity Prediction, Top-Npopular videos, Cross-domain

INTRODUCTION

P Opularity prediction of online videos, especially the prediction of the top-N popular videos is of great importance to support the development of online video services (OVSs). From the perspective of better user experience, the ability to identify the top-N popular videos is beneficial to video services, such as caching and recommendation. From the perspective of commercialization, popularity trends of these unpopularvideos to achieve better performance on the video set as a whole. Prediction of the top-N popular videos remains a challenging problem for the following reasons. First, popular and unpopular videos may have similar early view patterns, and this similarity limits the performance benefit of video classification based on early view patterns [6]. Second,

APPLICATION OF AUTO ENCODERS FOR ANALYSIS AND PREDICTION ONLINE FUNDS TRANSACTIONS USING MACHINE LEARNINGAUTO ENCODERS

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Abstract: In recent years credit card fraud has become one of the growing problems. It is vital that credit card companies are able to identify fraudulent credit card transactions, so that customers are not charged for the items that they didn't purchase. The reputation of companies will heavily damage and endangered among the customers due to fraud in financial transactions.The fraud detection techniques were increasing to improve accuracy to identify the fraudulent transactions. This project intends to build an unsupervised fraud detection method using auto encoder. An Auto encoder with four hidden layers which hasbeen trained and tested with a dataset containing an European cardholder transactions that occurred in two days with 284,807 transactions from

1. INTRODUCTION

A credit card is a thin handy plastic card that contains identification information such as asignature or picture, and authorizes the person named on it to charge purchases or services to his account - charges for which he will be billed periodically. They have a unique card number which is of utmost importance. Its security relies on the physical security of the plastic card as well as the privacy of the credit card number.

There is a rapid growth in the number of credit card transactions which has led to a substantial rise in fraudulent activities. Credit card fraud is a wide-ranging term for theft and fraud committed using a credit card as a fraudulent source of funds in a given transaction. Generally, statistical methods and many data mining algorithms are used to solve this fraud detection problem. Most of the credit card fraud detection systems are based on artificial intelligence, Meta learning and pattern matching.

Fraud detection is a binary classification problem in which the transaction data is analyzed and classified as "legitimate" or"fraudulent". Credit card fraud detection techniques are classified in two general categories: fraud analysis (misuse detection) and user behavior analysis (anomaly detection).

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APPLICATION OF CHAOTIC BLOCKCHAIN ALGORITHM FOR EFFICIENT DIGITAL CERTIFICATE VALIDATION

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ABSTRACT: In the digital world, each and everything is digitalized in which the certificate of SSLC, HSC, and academic certificate are digitalized in the educational institution and provided to the students. Students are difficult to maintain their degree certificates. For the organization and institution, verification and validation of certificates are tedious and cumbersome. Our project will help to store the certificate in the blockchain system and provide security. First, the paper certificates are converted into digital certificates. The chaotic algorithm is used to generate the hash code value for the certificate. Then the certificates are store in blockchain. And these certificates are validated by using the mobile application. By using blockchain technology we can provide a more secure and efficient digital certificate validation.

1. INTRODUCTION

Block chain was introduced in the year 2008 by Satoshi Nakamoto. Block chain is one of the online ledgers which provide decentralized and transparent data sharing. In this project, we design an android application

used to provide secure verification of our certificates. In nowadays, all Graduation certificates and transcripts hold information that is easily tampered illegally by individuals and should not be easily accessible to outside entities. Hence, there is a high need for an efficient mechanism, that can guarantee the information in such certificates is original, which means the document has originated from a reliable and authorized source and is not forged. Various systems have been designed to secure e-certificates for education institutions and to store them securely in cloud-based systems. Blockchain is the main tool to felicitate this need and when combined with different hashing techniques, this becomes a powerful method for protecting the data. It also helps in eliminating the need for constant verification of certificates. Blockchain technology is used to reduce the incidence of certificate forgeries and ensure that the security, validity, and confidentiality of graduation certificates would be improved. Technologies that exist in security domains include digital signatures, which are used in digital documents to provide authentication, integrity, and non-repudiation. Also, with blockchain in play, the storage of certificates is more secure. With these technologies, an application created that facilitates the secure validation of digital certificates.

A GENERIC MODEL TO ANALYSIS AND PREDICT THE STUDENT'S ACADEMIC PERFORMANCE

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ABSTRACT: Developing tools to support students and learning in a traditional or online setting is a significant task in today's educational environment. The initial steps towards enabling such technologies using machine learning techniques focused on predicting the student's performance in terms of the achieved grades. The disadvantage of these approaches is that they do not perform as well in predicting poor-performing students. The objective of our work is two-fold. First, in order to overcome this limitation, we explore if poorly per- forming students can be more accurately predicted by formulating the problem as binary classification. Second, in order to gain insights as to which are the factors that can lead to poor performance, we engineered a number of human- interpretable features that quantify these factors. These features were derived from the students' grades from the University of Minnesota, an undergraduate public institution. Based on these features, we perform a study to identify different student groups of interest, while at the same time, identify their importance.

I INTRODUCTION

Educational data mining (EDM) is an emerging discipline, concerned with developing methods for exploring the unique types of data that come from educational settings, and using those methods to better understand students, and the settings which they learn in. There are several data regarding the students which stay unused with untapped potential of data mining which could revolutionize the field of education. Since the ultimate aim of an educational institution is to create a pool of skilled professionals to take on the society to a next upgraded level, they need to create an environment for their students to grow in every vertical by giving them right exposure and training. Most of the educational institutions, maintain huge databases of students and the information keeps on increasing with time, but there is no action taken to gain knowledge from it. DM has the suitable techniques in mining the data to discover new information and knowledge about students. DM provides various methods for analysis which include classification, clustering, and association rules. Classification, one of the prediction algorithms, classifies the data (constructs a pattern) based on the training set and uses the pattern to classify a new data (testing set). In this paper, we consider the students' academic performance (SAP) system in University Sultan Zainal Abidin (UniSZA), Kuala Terengganu, Malaysia as our existing system. IHL faces a major challenge in order to improve and manage the organization to be more efficient in managing students' activities. To achieve this target, DM is considered as the one of most suitable technique in giving additional insights to the IHL community to help them make better decisions in educational activities. The IHL make use of WEKA tool in order to build a model and predict the SAP in order for the professors to provide the students with individual attention. In SAP system, the classification method is selected to be applied on the students' data. This system makes use

A PREDICTION MODEL FOR THE PATIENTS ADMISSIONS WITH MACHINE LEARNING

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Abstract: people will face many problems in Hospitals while taking Admission. If it is in a popular hospital, they should wait hours together to take just admission. But it is not at all good at Emergency Department. Veryserious cases will admit in Emergency Department. So, we need to use more innovation technique to ameliorate patient flow and prevent Overflowing. So, data mining techniques will show us a pleasant method to predict the ED Admissions. Here we Analyzed an algorithm for predicting models i.e., Naive Bayes, Random Forests, Support VectorMachine. For the prediction we should identify a handful of factors associated to Hospital admission including age, gender, systolic pressure, diastolic pressure, diabetes, previous records in the preceding month or year, admission. We also say about the algorithms which we used in detail. We use Random Forests algorithm for

classifying the data into categories for improving the accuracy of prediction. Naive Bayes is used to identify the probabilities for each attribute and helpsin predicting the outcome. Support Vector machine is used to classify the given input particular category which helps in predicting the outcome.

1. INTRODUCTION

One of the biggest yet overlooked problems in the MedicalIndustry is Emergency Department Crowding. These are themost severely injured or patients who need immediateattention. However, it is often very difficult to identify the stateof all the patients in the Emergency ward which leads tomaking wrong decisions which soon leads to overcrowding. This is why the ability to identify the state of a patient has become crucial worldwide.

Overcrowding might seem like an easy problem to get overbut in reality, it is very hard to handle. The consequences are harsh and will directlyimpact the patients as well as the staff in thehospital as the wait times will increase drastically and it will be too late for anyone toreact due to the shortage of required staff. Thisis why it is necessary for us to come up withinnovative approaches to solve this global issue to improve the patient flow and preventingpatient crowding.

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DEEP TEXTURE FEATURES EXTRACTION USING CNN FOR IDENTIFYING FAKE IMAGES ON OSN

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ABSTRACT: These days, the availability of image processing software, such as Adobe Photoshop or GIMP have made image manipulation so common. Detecting such fake images is unavoidable for unveiling of the image-based cybercrimes. An image taken by digital camera or smartphone is usually saved in the JPEG format due to its popularity. JPEG algorithm works on image grids, compressed independently, with a size of 8x8 pixels. While unmodified images, have a similar error level. For resaving operation, each block should degrade at around same rate due to similar number of errors across the whole image. The compression ratio of this fake image is different from that of the original image and is detected using Error Level Analysis. The objective of our paper is to develop a photo forensics algorithm which can detect any photo manipulation. The error level analysis was then enhanced using vertical and horizontal histograms of error level analysis image to pinpoint the location of modification. Results show that the proposed algorithm could identify the modified image while showing the exact location of modifications.

I .INTRODUCTION

The use of technology in today's world has been increased massively, one of the most common sources of communication is using images in these days, images has become pretty common these days they are used in newspapers, magazines, websites andadvertisements and provide several information. The trust in images is increasing day by day due to their increase in everyday usage. Tampering or manipulating an image by altering some information within it is known as image forgery and to check whether the image is real or not is termed as Image Forgery Detection. Enormous number of people have become victims of image forgery in our modern society. A lot of people use image manipulating software's to manipulate images and use

it as evidence to mislead the court or several other people on social media sites or applications. This is why every image that is shared on the social media should be evaluated and generalized as either real or fake. Social media is one of the best platforms to socialize, share and spread knowledge but if no precautions are taken, it can mislead people resulting to cause havoc due to unintentional false propaganda. While it takes some practice to photoshop images and can clearly be observed due to pixelization and shady jobs by novices but some of them when manipulated by a professional can indeed appear genuine. Especially in the political aspect's images can be manipulated to make or break apolitician's credibility.

A Novel method for detection of Online User Depression Using Text Sequence with Neural Network

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ABSTRACT

Depression is a psychological disorder that affects over three hundred million humans worldwide. A person who is depressed suffers from anxiety in day-today life, which affects that person in the relationship with their family and friends, leading to different diseases and in the worst-case death by suicide. With the growth of the social network, most of the people share their emotion, their feelings, their thoughts in social media. If their depression can be detected early by analyzing their post, then by taking necessary steps, a person can be saved from depression-related diseases or in the best case he can be saved from committingsuicide. In this research work, a hybrid model has been proposed that can detect depression by analyzing user's textual posts. Deep learning algorithms were trained using the training data and then performance has been evaluated on the test data of the dataset of reddit which was published for the pilot piece of work, Early Detection of Depression in CLEF eRisk 2019. In particular, Bidirectional Long Short Term Memory (BiLSTM) with different word embedding techniques and metadata features were proposed which gave good results.

1. INTRODUCTION:

According to World Health Organization (WHO), more than 300 million people worldwide are suffering from depression, which equals about 4.4 percent of the global population. While forms of depression are more common among females (5.1 percent) than males (3.6percent) and prevalence differs between regions of the world, it occurs in any age group and is not limited to any specific life situation. Depression is therefore often described to be accompanied by paradoxes, caused by a contrast between the self-image of a depressed person and the actual facts. Latest results from the 2016 National Survey on Drug Use and Health in the United States report that, during the year 2016, 12.8 percent of adolescents between 12 and 17 years old and 6.7 percent of adults had suffered a major depressive episode (MDE).