PRAGATI ENGINEERING COLLEGE (AUTONOMOUS)

Approved by ACITE,New Delhi & Permanently Affilicated to JNTUK,Kakinada &Accredited By NAAC with 'A' Grade

SUTANTRA

- Information for enlightening

DEPARTMENT OF INFORMATION TECHNOLOGY

JULY-2017

ABOUT THE DEPARTMRENT

Vision of the Institute

To emerge as a Premier Institution for Technical Education in the Country through Academic Excellence and to be recognized as a Centre for Excellence in Research & Development , catering to the needs of our Country.

Mission of the Institute

To realize a strong Institution by consistently maintaining State-of-art infrastructure and building a cohesive, World Class Team and provide need based Technical Education , Research and Development through enhanced Industry Interaction..

Department Vision

To attain academic excellence in the field of Information Technology and research serving to the needs of the society through technological developments.

Department Mission

M1: To create stimulating learning ambiance by providing state-of-art infrastructure and to induce innovative and problem-solving capabilities toaddress societal challenges.

M2: To impart quality technical education with professional team tomake the graduates globallycompetent to ITEnabled Services.

M3: To strengthen industry-academia relationship for enhancing research capabilities.

PSOs for B.Tech IT Program

PSO1: Develop software programs in various programming languages learnt to create the software applications to solve the real life problems of the society.

PSO2: Excel in emerging software tools and technologies.

PSO3: Effectively transform their ideas and bring consensus for the transformation of the idea into a usable software product / application.

PEOs for B.Tech IT Program

PEO 1: To have a successful career in IT as researchers, entrepreneurs and IT professionals satisfying the needs of the society.

PEO 2: To motivate students towards higher education and incline them towards continuous learning process.

PEO 3: To inculcate professional ethics of IT industry and prepare them with effective soft skills essential to work in teams.

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PROGRAM OUTCOMES

1. Engineering knowledge:

Apply the knowledge of mathematics,science,engineering fundamentals,and an engineering specialization to the solution of complex engineering problems .

2. Problem analysis:

Identify,formulate,reviewresearchLiterature, andanalyze complex engineering problemsreaching substantiated conclusions usingfirstprinciples ofmathema tics,natural sciences,and engineering sciences.

3.Design/ development of solutions:

Design solutions for complexengineering problems and design systemcomponents or processes that meet the Specified needs with appropriateconsideration for the publichealth and safety,and the cultural,societal, and environmental considerations.

4. Conduct investigations of complex problems:

Use research-based knowledge andresearch methods including design of expe riments, analysis and interpretat ion of data, and synthesis of the information to provide valid conclusions.

5.Modern tool usage:

Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction andmodeling to complex engineering activities with an understanding of the limitations.

6. The engineer and society:

Apply reasoning informed by the contextual knowledge to assess societal, health safety, legal and cultural issues and the consequen responsibilities relevant tothe professional engineering practice.

7. Environment and sustainability:

Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development

8. Ethics:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. Individual and team work:

Function effectively as an individual,and as a member or leader in diverse teams, and in multidisciplinary settings.

10. Communication:

Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

11. Project management and finance:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multid isciplinary environments.

12. Life-long learning:

Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Robotic Process Automation

Like AI and Machine Learning, Robotic Process Automation, or RPA, is another technology that is automating jobs. RPA is the use of software to automate business processes such as interpreting applications, processing transactions, dealing with data, and even replying to emails. RPA automates repetitive tasks that people used to do. These are not just the menial vtasks of a low-paid worker:up to 45 percent of the activities we do can be automated, including the work of financial managers, doctors and CEOs.

Although Forrester Research estimates RPA automation will threaten the livelihood of 230 million or more knowledge workers, or approximately 9 percent of the global workforce, RPA is also creating new jobs while altering existing jobs. McKinsey finds that less than 5 percent of occupations can be totally automated, but about 60 percent can be partially automated.

For you as an IT professional looking to the future and trying to understand technology trends, RPA offers plenty of career opportunities, including developer, project manager, business analyst, solution architect and consultant. And these jobs pay well. SimplyHired .com says the average RPA salary is $73,861, but that is the average compiled from salaries for junior-level developers up to senior solution architects, with the top 10 percent earning over $141,000 annually. So, if you're keen on learning and pursuing a career in RPA, the Introduction to Robotic Process Automation (RPA) course should be the next step you take to kickstart a RPA career.

How is RPA different from other enterprise automation tools?

In contrast to other, traditional IT solutions, RPA allows organizations to automate at a fraction of the cost and time previously encountered. RPA is also non-intrusive in nature and leverages the existing infrastructure without causing disruption to underlying systems, which would be difficult and costly to replace. With RPA, cost efficiency and compliance are no longer an operating cost but a byproduct of the automation

Mr.P.Surya Prabhakara Rao,
Assistant Professor

Cyber security

Cybersecurity might not seem like emerging technology, given that it has been around for a while, but it is evolving just as other technologies are. That's in part because threats are constantly new. The malevolent hackers who are trying to illegally access data are not going to give up any time soon, and they will continue to find ways to get through even the toughest security measures . It's also in part because new technology is being adapted to enhance security. As long as we have hackers, we will have cyber security vas an emerging technology because it will constantly evolve to defend against those hackers.

As proof of the strong need for cybersecurity professionals,the number of cybersecurity jobs is growing three times faster than other tech jobs. However, we're falling short when it comes to filling those jobs. As a result, it's predicted that we will have 3.5 million unfilled cybersecurity jobs by 2021.

Many cyber security jobs pay six-figure incomes,androles can range from ethical hackerto security engineer to Chief Security Officer, offering a promising career path for someone who wants to get into and stick with this domain.

In today's connected world, everyone benefits from advanced cyberdefense programs. At an individual level , a cybersecurity attack can result in everything from identity theft, to extortion attempts, to the loss of important data like family photos. Everyone relies on critical infrastructure like power plants, hospitals, and financial service companies. Securing these and other organizations is essential to keeping our society functioning.

Everyone also benefits from the work of cyberthreat researchers, like the team of 250 threat researchers at Talos, who investigate new and emerging threats and cyber attack strategies. They reveal new vulnerabilities, educate the public on the importance of cybersecurity, and strengthen open source tools. Their work makes the Internet safer for everyone.

Mrs. K.R.L.Srujana
Assistant Professor

Space Mouse

Every day of your computing life, you reach out for the mouse whenever you want to move the cursor or activate something. The mouse senses your motion and your clicks and sends them to the computer so it can respond appropriately. An ordinary mouse detects motion in the X and Y plane and acts as a two dimensional controller. It is not well suited for people to use in a 3D graphics environment

Space Mouse is aprofessional 3D controller specifically designed for manipulating objects in a 3D environment .It permits the simultaneous control of all six degrees of freedom - translation rotation or a combination. The device serves as an intuitive man-machine interface

The predecessor of the spacemouse was the DLR controller ball. Spacemouse has its origins in the late seventies when the DLR (German Aerospace Research Establishment) started research in its robotics and system dynamics division on devices with six degrees of freedom (6 dof) for controlling robot grippers in Cartesian space. The basic principle behind its construction is mechatronics engineering and the multisensory concept. The spacemouse has different modes of operation in which it can also be used as a two-dimensional mouse.

Mice first broke onto the public stage with the introduction of the Apple Macintosh in 1984, and since then they have helped to completely redefine the way we use computers. Every day of your computing life, you reach out for your mouse whenever you want to move your cursor or activate something. Your mouse senses your motion and your clicks and sends them to the computer so it can respond appropriately.

Mrs.P.V.Komali
Assistant Professor

Quantum Information Technology

The subject of quantum computing brings together ideas from classical information theory, computer science, and quantum physics. This document aims to summarize not just quantum computing , but the whole subject of quantum information theory. It turns out that information theory and quantum mech anics fit together very well.

In order to explain their relationship, the paper begins with an introduction to classical information theory .The principles of quantum mechanics are then outlined.

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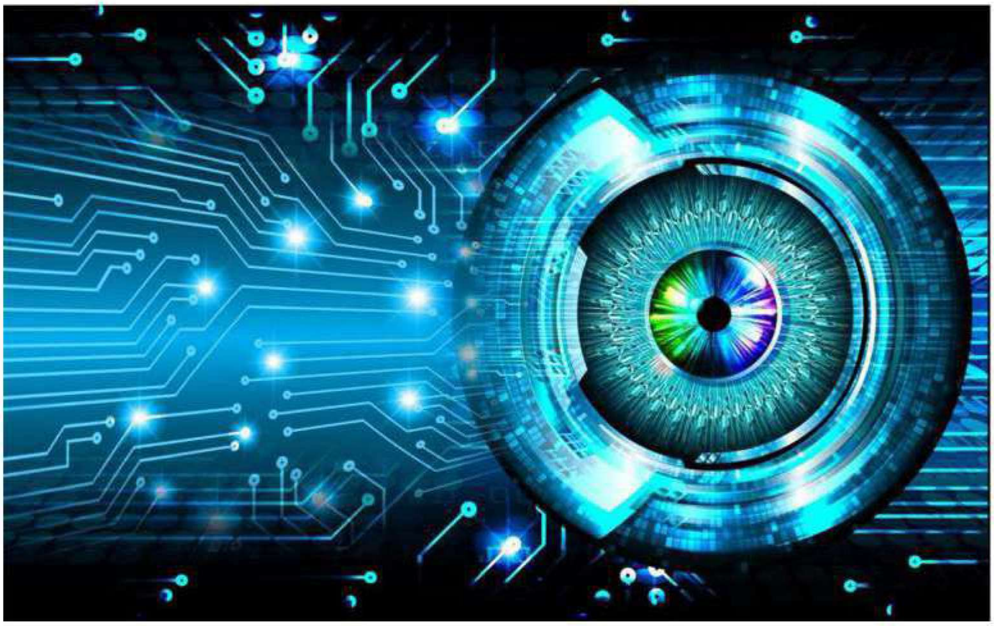
Now, if this seems like a joke, wait a second. "Tomorrows computer might well resemble a jug of water" This for sure is no joke. Quantum computing is here. What was science fiction two decades back is a real ity today and is the future of computing. The history of computer technology has involved a sequence of changes from one type of physical realization to another --- from gears to relays to valves to transistors to integrated circuits and so on. Quantum computing is the next logical advancement.

Today's advanced lithographic techniques can squeeze fraction of micron wide logic gates and wires onto the surface of silicon chips. Soon they will yield even smaller parts and inevitably reach a point where logic gates are so small that they are made out of only a handful of atoms. On the atomic scale matter obeys the rules of quantum mechanics , which are quite different from the classical rules that determine the properties of conventional logic gates. So if computers are to become smaller in the future, new, quantum technology must replace or supplement what we have now.

Quantum technology can offer much more than cramming more and more bits to silicon and multiplying the clock-speed of microprocessors. It can support entirely new kind of computation with qualitatively new algorithms based on quantum principles!

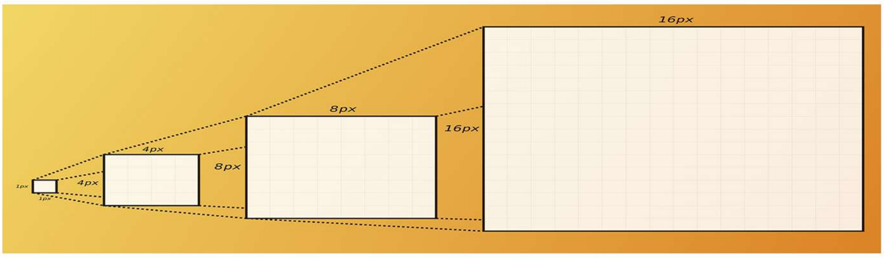
Mrs.Y.Srilatha
Assistant Professor

Image Processing and Compression Technique



An image defined in the "real world" is considered to be a function of two real variables say x,y. Be fore going to processing an image, it is converted into a digital form . Digitization includes sampling of image and quantization of sampled values..

After converting the image into bit information, processing is performed. This processing technique may be,



" Image enhancement

" Image reconstruction

" Image compression

Image enhancement refers to acentuation, or sharpening, of image features such as boundaries.

Image restoration is concerned with filtering the observed image to minimize the effect of degradations.

Image compression is concerned with minimizing the no of bits required to represent an image.

Text compression - CCITT GROUP3 & GROUP4

Still image compression - JPEG

Video image compression -MPEG

Mrs.N.Vani Santhoshi Sowjanya
Assistant Professor

Worldwide Inter operatibility for Microwave Access

In recent years, Broadband technology has rapidly become an established, global commodity required by a high percentage of the population. The demand has risen rapidly, with a worldwide installed base of 57 million lines in 2002 rising to an estimated 80 million lines by the end of 2003. This healthy growth curve is expected to continue steadily over the next few years and reach vtthe 200 million mark by 2006.

DSL operators, who initially focused their deployments in densely-populated urban and metropolitan are as, are now challenged to provide broadband services in suburban and rural areas where new markets are quickly taking root. Governments are prioritizing broadband as a key political objective for all citizens to overcome the "broadband gap" also known as "digital divide".

Wireless DSL (WDSL) offers an effective, complementary solution to wireline DSL, allowing DSL operators to provide broadband service to additional areas and populations that would otherwise find themselves outside the broadband loop.

Government regulatory bodies are realizing the inherent worth in wireless technologies as a means for solving digital-divide challenges in the last mile and have accordingly initiated a deregulation process in recent years for both licensed and unlicensed bands to support this application. Recent technological advancements and the formation of a global standard and interoperability forum - WiMAX, set the stage for WDSL to take a significant role in the broadband market. Revenues from services delivered via Broadband Wireless Access have already reached $323 million and are expected to jump to $1.75 billion.

E-Mail Newsletters:

There are several ways to get a fast Internet connection to the middle of nowhere. Until not too long ago the only answer would have been "cable" - that is, laying lines. Cable TV companies, who would be the ones to do this, had been weighing the costs and benefits.

However this would have taken years for the investment to pay off. So while cable companies might be leading the market for broadband access to most people (of the 41% of Americans who have high-speed Internet access, almost two-thirds get it from their cable company), they don't do as well to rural areas. And governments that try to require cable companies to lay the wires find themselves battling to force the companies to take new customers.

Mrs.S.Teja Swarupa,
Assistant Professor

Edge computing

It is worth highlighting that many overlapping and sometimes conflicting definitions of edge computing exist—edge computing means many things to many people. But for our purposes, the most mature view of edge computing is that it is offering application developers and service providers cloud computing capabilities, as well as an IT service environment at the edge of a network. The aim is to deliver compute, storage, and bandwidth much closer to data inputs and/or end users. An edge computing environment is characterized by potentially high latency among all the sites and low and unreliable bandwidth—alongside distinctive service delivery and application functionality possibilities that cannot be met with a pool of centralized cloud resources in distant data centers. By moving some or all of the processing functions closer to the end user or data collection point, cloud edge computing can mitigate the effects of widely distributed sites by minimizing the effect of latency on the applications. Edge computing first emerged by virtualizing network services over WAN networks, taking a step away from the data center. The initial use cases were driven by a desire to leverage a platform that delivered the flexibility and simple tools that cloud computing users have become accustomed to. As new edge computing capabilities emerge, we see a changing paradigm for computing—one that is no longer necessarily bound by the need to build centralized data centers. Instead, for certain applications, cloud edge computing is taking the lessons of virtualization and cloud computing and creating the capability to have potentially thousands of massively distributed nodes that can be applied to diverse use cases, such as industrial IoT or even far-flung monitoring networks for tracking real time water resource usage over thousands, or millions, of locations. Many proprietary and open source edge computing capabilities already exist without relying on distributed cloud—some vendors refer to this as “device edge.” Components of this approach include elements such as IoT gateways or NFV appliances. But increasingly, applications need the versatility of cloud at the edge, although the tools and architectures needed to build distributed edge infrastructures are still in their infancy. Our view is that the market will continue to demand better capabilities for cloud edge computing. Edge computing capabilities include, but are not limited to:

- A consistent operating paradigm across diverse infrastructures.
- The ability to perform in a massively distributed (think thousands of global locations) environment.
- The need to deliver network services to customers located at globally distributed remote locations.
- Application integration, orchestration and service delivery requirements.
- Hardware limitations and cost constraints.
- Limited or intermittent network connections.
- Methods to address applications with strict low latency requirements

A Manasa

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Barcode technology works of off a principle called symbology. Symbology at its basic form is what defines the barcode; it determines the mapping and interpretation of the encoded information or data. This encoding allows the scanning device to know when a digit or character starts and when it stops, similar to a binary representation. We recognize barcodes as an array of parallel lines alternating between white and black lines. Barcode technology provides a simple and inexpensive method of recording data or information in a number of applications. The symbologies of the barcode technology can be arranged or mapped in a variety of ways. A continuous symbology is marked by the characters beginning with a black line and ending with a white line or space, while discreet symbologies have characters encoded as a black line a space and then another black line. This takes care of the characters and how each individual number or letter is read. The lines of a barcode also have variances in encoding the widths of the lines. Some barcode technology systems use two separate widths to determine the character while others use multiple width lines. The use of any of these encoding styles depends, of course, on the application for which the barcode technology is being used. The line or linear barcode technology is sometimes referred to as 1D encoding. While we are most familiar with these barcodes, there are more complex codes that employ the use of dot matrixes to achieve a more complex encoding process that can store and identify far more information. These are referred to as 2D or, in some cases dataglyphs. They are comprised of miniature dots, like the old dot matrix printers, which create patterns that are read in the scanning process. They are not limited to this format and can be comprised of circular patterns or a collection of shapes and modules inserted into a specified image for a user. In order to read the data of barcode technology it needs to be scanned by a laser and then interpreted. The scanners, or lasers, used to read the barcodes measures the light reflected form the linear barcode technology and can distinguish between the white and black lines. Calibration of the laser and system needs to be done to ensure the proper interpretation of the code itself. This has to do with whether it is a continuous or discreet symbology, 1D or 2D images, and whether it uses two width or multiple width lines. The most common lasers used are helium neon lasers due to their low energy consumption and efficiency. The complex or 2D barcodes can not be read by a simple laser as the linear barcode technology can. The barcode needs an all encompassing reader as the full image needs to be read. Linear barcode technology only needs to be swept across to read it as the lines are the same regardless of the position of the laser. 2D codes must be read or scanned by an image based scanner, similar to the scanners used at home or in offices to scan documents and images. They are more costly but supply more information and data. These are used in encoding URLs for cellular phone use and higher end applications.

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