PRAGATI ENGINEERING COLLEGE (AUTONOMOUS)

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

Sutantra

-Information for enlighten

DEPARTMENT OF INFORMATION TECHNOLOGY

JANUARY-2017

ABOUT THE DEPARTMENT

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 to address societal challenges.
M2: To impart quality technical education withprofessional team to make the graduates globally competent to IT Enabled 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.

PROGRAM OUTCOMES for IT DEPARTMENT

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 under standing of the limitations.

6. The engineer and society:

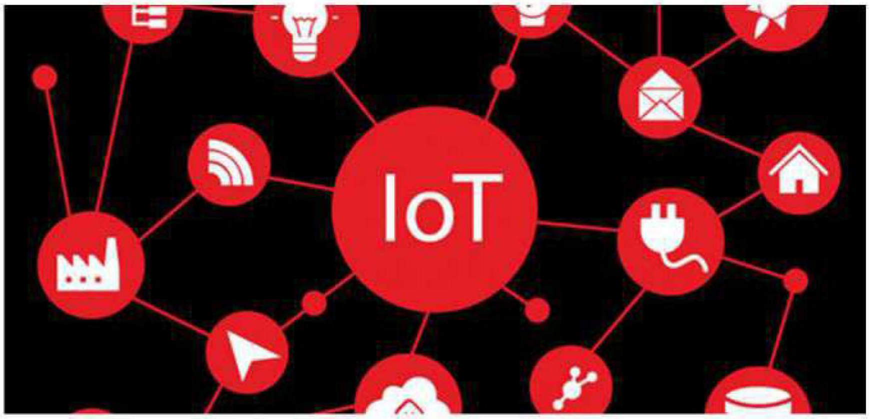
Apply reasoning informed by the contextual knowledge to assess societal, health safety, legal and cultural issues and the consequen responsibilities relevant tothe professional engineering practice.

7. Environment and sustainability:

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

Internet of Things

History of the Internet of Things:



The term "Internet of Things" was coined by entrepreneur Kevin Ashton, one of the founders of the Auto-ID center at MIT. Ashton was part of a team that discovered how to link objects to the internet through an RFID tag. He first used the phrase "Internet of Things" in a 1999 presentation – and it hasstuck around ever since. Ashton may have been first to use the term Internet of Things, but the concept of connected devices – particularly connected machines – has been around for a long time. For example, machines have been communicating with each other since the first electric telegraphs were developed in the late 1830s. Other technologies that fed into IoT were radio voice transmissions, wireless (Wi-Fi) technologies and supervisory control and data acquisition (SCADA) software. Then in 1982, a modified Coke machine at Carnegie Mellon University became the first connected smart appliance. Using the university's local ethernet or ARPANET – a precursor to today's internet – students could find out which drinks were stocked, and whether they were cold.Today, we're living in a world where there are more IoT connected devices than humans. These IoT connected devices and machines range from wearables like smartwatches to RFID inventory tracking chips. IoT connected devices communicate via networks or cloud-based platforms connected to the Internet of Things. The real-time insights gleaned from this IoT collected data fuel digital information.The Internet of Things promises many positive changes for health and safety, business operations, industrial performance, and global environmental and humanitarian issues.

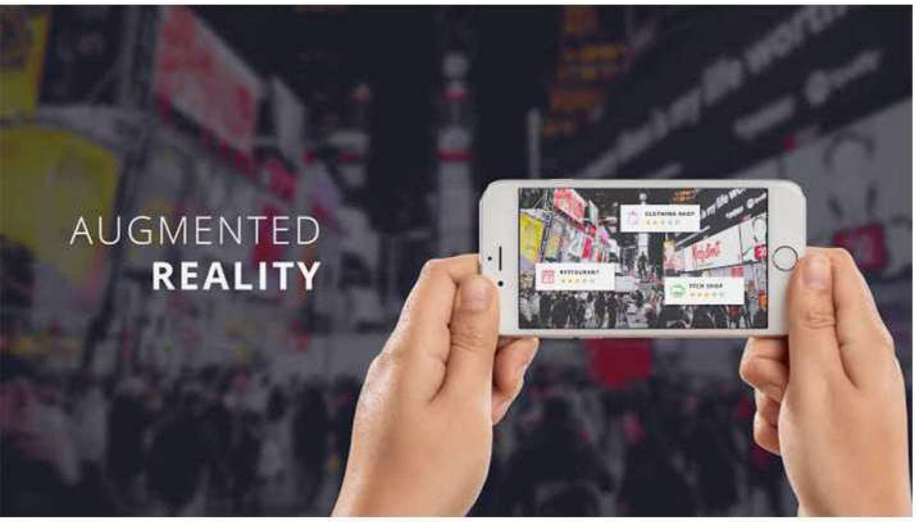
Who Is Using IoT?

Many industries use IoT to understand consumer needs in real time, because more responsive, improve machine and system quality on the fly, stream line operations and discover innovative ways to operate as part of their digital transformation efforts.

Retail
Manufacturing
Healthcare
Transportation and Logistics
Government

Mr.P.Surya Prabhakara rao,
Assistant Professor

Augmented Reality



Augmented reality (AR) is one of the biggest technology trends right now, and it's only going to get bigger as AR ready smartphones and other devices become more accessible around the world. AR let us see the real-life environment right in front of us—trees swaying in the park, dogs chasing balls, kids playing soccer—with a digital augmentation overlaid on it. For example, a pterodactyl might be seen landing in the trees, the dogs could be mingling with their cartoon counterparts, and the kids could be seen kicking past an alien spacecraft on their way to score a goal. With advances in AR technology, these examples are not that different from what might already be available for your smartphone. Augmented reality is, in fact, readily available and being used in a myriad of ways including as Snapchat lenses, in apps that help you find your car in a crowded parking lot, and in variety of shopping apps that let you try on clothes without even leaving home.Perhaps the most famous example of AR technology is the mobile app Pokemon Go, which was released in 2016 and quickly became an inescapable sensation. In the game, players locate and capture Pokemon characters that pop up in the real world—on your sidewalk, in a fountain, even in your own bathroom.

Mr.V.Surya Prakash,
Assistant Professor

SUTANTRA

- Information for Enlighten

Virtual Reality

What is Virtual Reality?

Virtual Reality (VR) is the use of computer technology to create a simulated environment . Unlike traditional user interfaces, VR places the user inside an experience. Instead of viewing a screen in front of them, users are immersed and able to interact with 3D worlds.By simulating as many senses as possible, such as vision, hearing, touch, even smell, the computer is transformed into a gatekeeper to this artificial world. The only limits to near-real VR experiences are the availability of content and cheap computing power.

What's the difference Between Virtual Reality and Augmented Reality?

Virtual Reality and Augmented Reality are two sides of the same coin. You could think of Augmented Reality as VR with one foot in the real world: Augmented Reality simulates artificial objects in the real environment; Virtual Reality creates an artificial environment to inhabit.

In Augmented Reality, the computer uses sensors and algorithms to determine the position and orientation of a camera. AR technology then renders the 3D graphics as they would appear from the viewpoint of the camera, superimposing the computer-generated images over a user's view of the real world.

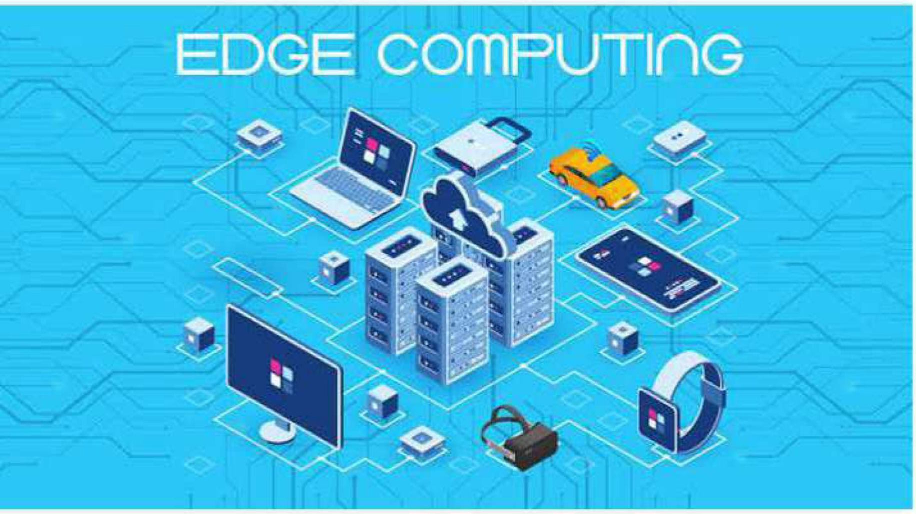
In Virtual Reality, the computer uses similar sensors and math. However, rather than locating a real camera within a physical environment, the position of the user's eyes are located within the simulated environment. If the user's head turns, the graphics react accordingly. Rather than compositing virtual objects and a real scene, VR technology creates a convincing, interactive world for the user.

Virtual Reality technology:

Virtual Reality's most immediately-recognizable component is the head-mounted display (HMD). Human beings are visual creatures, and display technology is often the single biggest difference between immersive Virtual Reality systems and traditional user interfaces. For instance, CAVE automatic virtual environments actively display virtual content onto room-sized screens. While they are fun for people in universities and big labs, consumer and industrial wearables are the wild west.

Mr.Ch.Venkata Ramana,
Assistant Professor

Edge Computing



Edge computing is a networking philosophy focused on bringing computing as close to the source of data as possible inorder to re duce latency and bandwidth use. In simpler terms, edgecomputing means running fewer processes in the cloud and moving those processes to local places, such as on a user's computer, an IoT device, or an edg e server. Bringing computation to the network's edge minimizes the amount of long-distance communication that has to happen between a client and server.For internet devices, the network edge is where the device, or the local network con taining the device, communicates with the Internet. The edge is a bit of a fuzzy term; for example a user's computer or the processor inside of an IoT camera can be considered the network edge, but the user's router, ISP, or local edge ser ver are also considered the edge. The important takeaway is that the edge of the network is geographically close to the device, unlike origin servers and cloud servers, whichcan be very far from the devices they communicate with.Consider a building secured with dozens of high-definition IoT video cameras. These are 'dumb' cameras that simply output a raw video signal and continuously stream that signal to a cloud server. On the cloud server, the video output from all the cameras is put through a motion-detection application to ensure that only clips featuring activity are saved to the server's database. This means there is a const ant and significant strain on the building's Internet infrastructure, as significant bandwidth gets consumed by thehigh volume of video footage being transferred. Additionally, there is very heavy load on the cloud server that has to process the video footage from all the cameras simultaneously

Ms.B.Preethi Devi,
Assistant Professor

IOT and Touch -Based Home Automation

We have seen various application soft but what about adding the touch to it. In this project,we will add simple touch buttonsto the ESP32 Wi-Fi module ESP32 is a great module to design ioT applications and adding touch to it will make it further smart. Talking about ESP32. it is a microcontroller designed by Espressif mainly for ioT applications. It is so handy that even a novice can useit ESP32 containsv Wifi,Bluetooth,Inbuilt Touch sensing input pins, temperature and hall sensors on board which makes it fit for loT and Smart home In ESP32. there are total 10 Touch Sensi ng general purpose Input Output (GPIO) pins. A touch-sensor system is built on a substrate which carries electrodes and relevant connections under a protective nat surface. When a user touches the sun face, the capacitance variation is triggered, and a binary signal is generated to indicate whether the touch is valid ESP32 can provide up to 10 capacitive touch pads/ GPIOS. The sensing pads can be arranged in different combinations leg matrix, slider so that a larger arca or merpoints can he detected. The touchpad sensing process is under the control of a hardware implement finite state machine (FSM which is initiated by software or a dedicated hardware timer. We will learn how to handle these touch pins and try to make an lol application around it We will also integrate Wi-Fi contrel to it.

Mrs. P. V.Komali
Assistant Professor

Detecting Financial Fraud Using Machine Learning

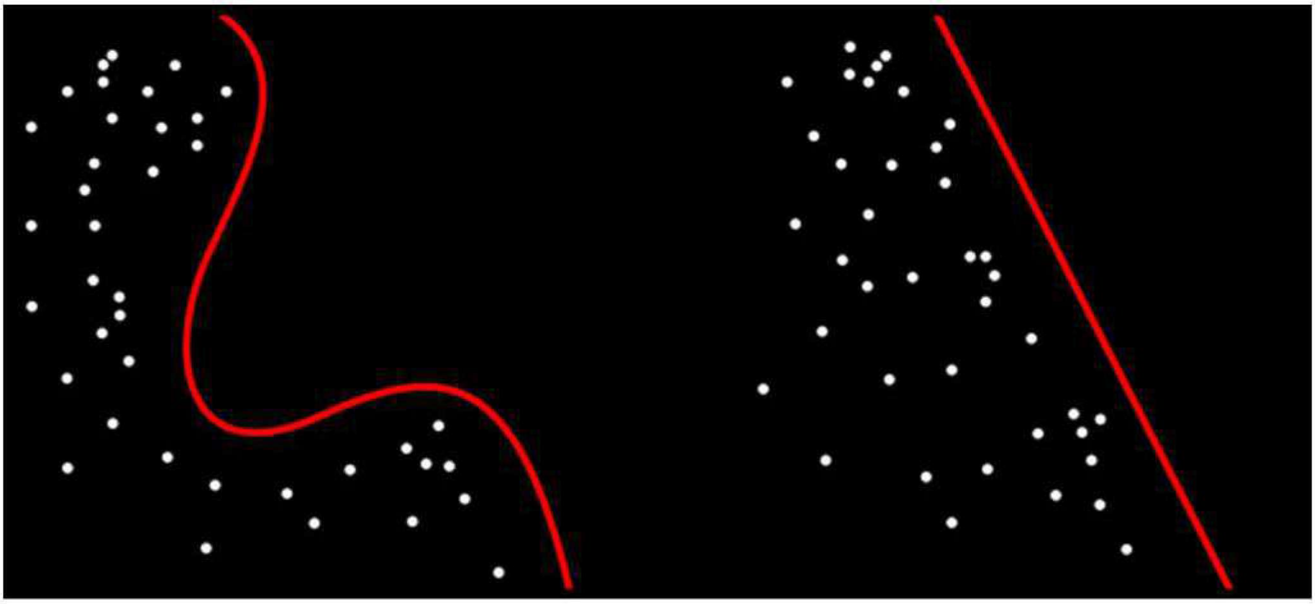
For years, fraudsters would simply take numbers from credit or debit cards and print them onto blank plastic cards to use at brick-and-mortar stores. But in 2015, Visa and Mastercard mandated that banks and merchants introduce EMV — chip card technology, which made it possible for merchants to start requesting a PIN for each transaction.

Nevertheless, experts predict online credit card fraud to soar to a whopping $32 billion in 2020.

Putting it into perspective, this amount is superior to the profits posted recently by some worldwide household, blue chip companies in 2017, such as Coca-Cola ($2 billions), Warren Buffet's Berkshire Hathaway ($24 billions) and JP Morgan Chase ($23.5 billions).

In addition to the implementation of chip card technology, companies have been investing massive amounts in other technologies for detecting fraudulent transactions.

Classification Problems:



In Machine Learning, problems like fraud detection are usually framed as classification problems — predicting a discrete class label output given a data observation. Examples of classification problems that can be thought of are Spam Detectors, Recommender Systems and Loan Default Prediction.

Mrs.G.Surya Kala Eswari,
Assistant Professor

Edge computing

Formerly a technology trend to watch, cloud computing has become mainstream, with major players AWS (Amazon Web Services), Microsoft Azure and Google Cloud dominating the market. The adoption of cloud computing is still growing, as more and more businesses migrate to a cloud solution. But it's no longer the emerging technology.

As the quantity of data we're dealing with continues to increase, we've realized the shortcomings of cloud computing in some situations. Edge computing is designed to help solve some of those problems as a way to bypass the latency caused by cloud computing and getting data to a datacenter for processing. It can exist "on the edge," if you will, closer to where computing needs to happen. For this reason, edge computing can be used to process time-sensitive data in remote locations with limited or no connectivity to a centralized location. In those situations, edge computing can act like mini datacenters. Edge computing will increase as use of the Internet of Things (IoT) devices increases. By 2022, the global edge computing market is expected to reach $6.72 billion. As with any growing market, this will create various jobs, primarily for software engineers.

Edge computing vs Cloud computing

Companies big and small are continually moving their applications to the cloud. More than 28 percent of an organization's total IT budget is now kept aside for cloud computing. Today, 70 percent of organizations have at least one application in the cloud, indicating that enterprises are realizing the benefits of cloud computing and slowly adapting.

Even as companies and industry experts predict the future growth of cloud computing, experts believe that the cloud has reached the end of its run at the top, and are betting on the growing popularity and benefits of edge computing.

Why Is Edge Computing Needed When Cloud Computing Is Available?

This is a pertinent question asked by most IT professionals. In the fireside chat, Bernard explains how edge computing is helpful in situations where organizations wish to bypass the latency caused while communicating information from the device across the network to the centralized computing system. He gives the example of a machine whose functionality is very crucial for an organization. A delay in the machine's decision-making process due to latency would result in losses for the organization. In such cases, organizations will prefer edge computing because smart devices with computation power are placed on the edge of the network. The device monitors a pre-defined metrics set for tolerance levels, if the metrics are outside of the prescribed tolerance, a warning signal is issued as soon as the machine reaches the failure level, resulting in the shutdown of the machine within microseconds to avoid further losses.

Ch. L. Sri Harshitha
(16A31A1207)

EDITORIAL BOARD