



# PRAGATI ENGINEERING COLLEGE (AUTONOMOUS)

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



# SUTANTRA

- INFORMATION FOR ENLIGHTENING

DEPARTMENT OF  
INFORMATION TECHNOLOGY  
January-2020



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## About IT department

The Department of IT was established in the year 2001 to groom the students for the requirements of IT industry. The Department has emerged as a reputed center of learning in the coastal districts of Andhra Pradesh. Footprints of the department's students can be found in most of the local and global software majors. Student of this department mainly, brought glory to the college by securing University Rank.

The department strives to empower the students, to achieve the demanding standards of IT industry, by bringing about a synergistic academic environment wherein cutting edge technologies, industry experts, faculty and students are engaged in a sustained interaction.

### Vision of the College

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

### Mission of the College

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**

- To create stimulating learning ambiance by providing state-of-art infrastructure and to induce innovative and problem-solving capabilities to address societal challenges.
- To impart quality technical education with professional team to make the graduates globally competent to IT Enabled Services.
- To strengthen industry-academia relationship for enhancing research capabilities.

**DEPARTMENT OF IT**



## PEOs for B.Tech IT Programme

PEO1:

Students will have successful career in IT as researchers, entrepreneurs and IT professionals satisfying the needs of the society.

PEO2:

Students will exhibit inclination towards higher education and continuous learning process.

PEO3:

Students will practice ethical behavior in IT industry with effective soft skills essential to work in teams.

## PSOs for B.Tech IT Programme

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.



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## Program Outcomes (POs)

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, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation 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 and modeling 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 consequent responsibilities relevant to the 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.



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## Geoffrey Hinton



Geoffrey Everest Hinton is a British-Canadian cognitive psychologist and computer scientist, most noted for his work on artificial neural networks. Since 2013 he divides his time working for Google (Google Brain) and the University of Toronto. In 2017, he cofounded and became the Chief Scientific Advisor of the Vector Institute in Toronto. With David Rumelhart and Ronald J. Williams, Hinton was co-author of a highly cited paper published in 1986 that popularized the back propagation algorithm for training multi-layer neural networks, although they were not the first to propose the approach. Hinton is viewed as a leading figure in the deep learning community.

The dramatic image-recognition milestone of the AlexNet designed in collaboration with his students Alex Krizhevsky and Ilya Sutskever for the ImageNet challenge 2012 was a breakthrough in the field of computer vision.

Honors and awards of Geoffrey Hinton

1. Hinton was elected a Fellow of the Royal Society (FRS) in 1998. He was the first winner of the Rumelhart Prize in 2001. His certificate of election for the Royal Society reads:
2. In 2001, Hinton was awarded an Honorary Doctorate from the University of Edinburgh. He was the 2005 recipient of the IJCAI Award for Research Excellence lifetime-achievement award. He has also been awarded the 2011 Herzberg Canada Gold Medal for Science and Engineering.
3. In 2013, Hinton was awarded an Honorary Doctorate from the Université de Sherbrooke
4. In 2016, he was elected a foreign member of National Academy of Engineering "For contributions to the theory and practice of artificial neural networks and their application to speech recognition and computer vision". He also received the 2016 IEEE/RSE Wolfson James Clerk Maxwell Award.
5. He has won the BBVA Foundation Frontiers of Knowledge Award (2016) in the Information and Communication Technologies category "for his pioneering and highly influential work" to endow machines with the ability to learn.
6. 2018, he was awarded a Companion of the Order of Canada.



## Neuromorphic Computing



Neuromorphic computing is a method of computer engineering in which elements of a computer are modeled after systems in the human brain and nervous system. The term refers to the design of both hardware and software computing elements.

Neuromorphic engineers draw from several disciplines -- including computer science, biology, mathematics, electronic engineering and physics -- to create artificial neural systems inspired by biological structures.

How does neuromorphic computing work?

Traditional neural network and machine learning computation are well suited for existing algorithms. It is typically focused on providing either fast computation or low power, often achieving one at the expense of the other.

Neuromorphic systems on the other hand, achieve both fast computation and low power consumption. They are also:

- massively parallel, meaning they can handle many tasks at once;
- event-driven, meaning they respond to events based on variable environmental conditions and only the parts of the computer in use require power;
- high in adaptability and plasticity, meaning they're very flexible.

Neuromorphic computing achieves this brain like function and efficiency by building artificial neural systems that implement "neurons" (the actual nodes that process information) and "synapses" to transfer electrical signals using analog circuitry. The system of neurons and synapses that transmit these electric pulses is known as a spiking neural network (SNN), which can measure these discrete analog signal changes and are not present in traditional neural networks that use less nuanced digital signals.

Mrs. D. Sirisha  
Associate Professor & HOD



## Computer Clothing



Wearable computer comprises of a computer built within ordinary clothing. This transformation allows it to be worn constantly, with the goal of becoming a seamless extension of body and mind. Equipped with various sensors which measure heart rate, respiration, footstep rate etc, the apparatus can function as a personal safety device for reducing crime, as well as personal health monitor for improving health care by encouraging individuals to take an active role in diagnosis and body maintenance. Recent advancements in miniature devices have fostered a dramatic growth of interest of wearable technology. Wearable Bio-Sensors (WBS) will permit continuous cardiovascular (CV) monitoring in a number of novel settings. WBS could play an important role in the wireless surveillance of people during hazardous operations (military , firefighting , etc) or such sensors could be dispensed during a mass civilian casualty occurrence . They typically rely on wireless, miniature sensors enclosed in ring or a shirt. They take advantage of handheld units to temporarily store physiological data and then periodically upload that data to a database server via wireless LAN or a cradle that allow internet connection and used for clinical diagnosis.

Electronic circuits are built entirely out of textiles to distribute data and power and perform touch sensing. These circuits are passive components sewn from conductive yarns as well as conventional components to create interactive electronic devices, such as musical keyboards and graphic input surfaces.

**Mrs. T Ganga Bhavani**  
**Assistant Professor**



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## Screen less Display



Screen less display is the present evolving technology in the field of the computer-enhanced technologies. It is going to be the one of the greatest technological development in the coming future years.

Several patents are still working on this new emerging technology which can change the whole spectacular view of the screen less displays.

Screen less display technology has the main aim of displaying (or) transmitting the information without any help of the screen (or) the projector. Screen less displays have become a new rage of development for the next GEN-X. Screen less videos describe systems for transmitting visual information from a video source without the use of the screen

Various companies have made significant breakthroughs in the field, including virtual reality headsets, the development of mobile phones for the elderly and partially blind people, and hologram like videos without the need for moving of glasses.

**D.MOUNIKA(17A31A1239)**

**An Investment in knowledge pays the best interest - Benjamn Franklin**





## 3D Internet



3D Internet, also known as virtual worlds, is a powerful new way for you to reach consumers, business customers, co-workers, partners, and students. It combines the immediacy of television, the versatile content of the Web, and the relationship-building strengths of social networking sites like Face book.

3D Internet shares the time-tested main principles and underlying architecture of the

current Internet as well as many semantic web concepts. The operational principles the 3D Internet shares with its predecessor include open and flexible architecture, open protocols, simplicity at the network core, intelligence at the edges, and distributed implementation. We adopt here the terms universe, world, and web place as 3D counterparts of WWW, website, and sub domain, respectively.

### Real Time Applications

- Education:** By implementing 3D Internet in education, people can have a better understanding of the subject. They can view lectures and experiments in a 3D manner that will help them learn more efficiently than the traditional approach.
- Real Estate:** 3D Internet can drastically change the real estate industry. Customers can view the property they are interested in online with a stereoscopic view.
- Tourism:** It is important to choose the right destination to spend holidays which can be much easier after the implementation of 3D Internet. Tourists can have a sample 3D view of the desired locations and later decide which destination has to be visited.
- Entertainment:** Online 3D games, 3D movies, etc. won't be a dream anymore. All this can

**T.A.LAKSHMIPRIYA (18A31A1229)**

Change is the end result of all true learning. – Leo Buscaglia



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## 5G Devices



5G is the 5th generation mobile network. It is a new global wireless standard after 1G, 2G, 3G, and 4G networks. 5G enables a new kind of network that is designed to connect virtually everyone and everything together including machines, objects, and devices. 5G is a unified, more capable air interface. It has been designed with an extended capacity to enable next-generation user experiences, empower

new deployment models and deliver new services. With high speeds, superior reliability and negligible latency, 5G will expand the mobile ecosystem into new realms. 5G will impact every industry, making safer transportation, remote healthcare, precision agriculture, digitized logistics — and more — a reality.

Through a landmark 5G Economy study, we found that 5G's full economic effect will likely be realized across the globe by 2035—supporting a wide range of industries and potentially enabling up to \$13.2 trillion worth of goods and services.

Broadly speaking, 5G is used across three main types of connected services, including enhanced mobile broadband, mission-critical communications, and the massive IoT. A defining capability of 5G is that it is designed for forward compatibility—the ability to flexibly support future services that are unknown today.

### Enhanced mobile broadband

In addition to making our smartphones better, 5G mobile technology can usher in new immersive experiences such as VR and AR with faster, more uniform data rates, lower latency, and lower cost-per-bit.

### Mission-critical communications

5G can enable new services that can transform industries with ultra-reliable, available, low-latency links like remote control of critical infrastructure, vehicles, and medical procedures

**P.VENKATA SAI (18A31A1251)**

Education is the passport to the future, for tomorrow belongs to those who prepare for it today. – Malcolm X



## Night Vision Technology



Originally developed for the military use, night vision technology allows one to see in the dark. We humans have poor night-vision compared to many animal species. But now with proper equipment we can see a person standing far away on a moonless cloudy night!

Today in the 21st century we have come a long way in developing night vision technology since it's discovery. It is used mainly for defense

purposes, as the law often prohibits its application within scientific or civilian ranges. Night vision devices let you see in the dark. With quality night vision goggles and scopes you can see people, animals, and objects up to 1,000 yards away on a dark night. Night vision monocular cameras let you take photographs and videos of things you can't see in the dark with your naked eyes.

Night vision devices:

1. Scopes – Monocular device, handheld or mounted on a weapon.
2. Goggles – Binocular and worn on the head.
3. Cameras – Used for capturing images/ recording videos.

Advantages:

1. No particular skill is required.
2. Compact system.
3. Reduction in accident cases.

**S.V.VARDHAN (18A31A1234)**

The roots of education are bitter, but the fruit is sweet. – Aristotle



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## **EDITORIAL BOARD**

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