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

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.

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.

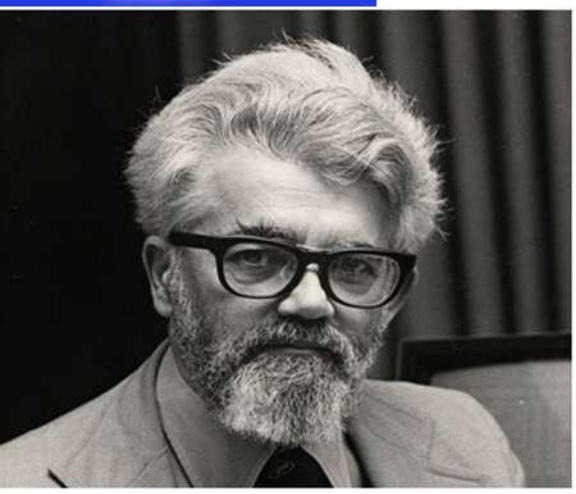
PSO3:

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

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.

John McCarthy



John McCarthy (September 4, 1927 – October 24, 2011) was an American computer scientist and cognitive scientist. McCarthy was one of the founders of the discipline of artificial intelligence He co-authored the document that coined the term "artificial intelligence" (AI), developed the Lisp programming language family, significantly influenced the design of the ALGOL programming language, popularized time-sharing, invented garbage collection, and was very influential in the early development of AI.

He received many accolades and honors, such as the 1971 Turing Award for his contributions to the topic of AI, the United States National Medal of Science, and the Kyoto Prize.

McCarthy often commented on world affairs on the Usenet forums. Some of his ideas can be found in his sustainability Web page, which is "aimed at showing that human material progress is desirable and sustainable". McCarthy was a serious book reader, an optimist, and a staunch supporter of free speech.

McCarthy saw the importance of mathematics and mathematics education. His Usenet .sig for years was, "He who refuses to do arithmetic is doomed to talk nonsense"; his license plate cover read, similarly, "Do the arithmetic or be doomed to talk nonsense."

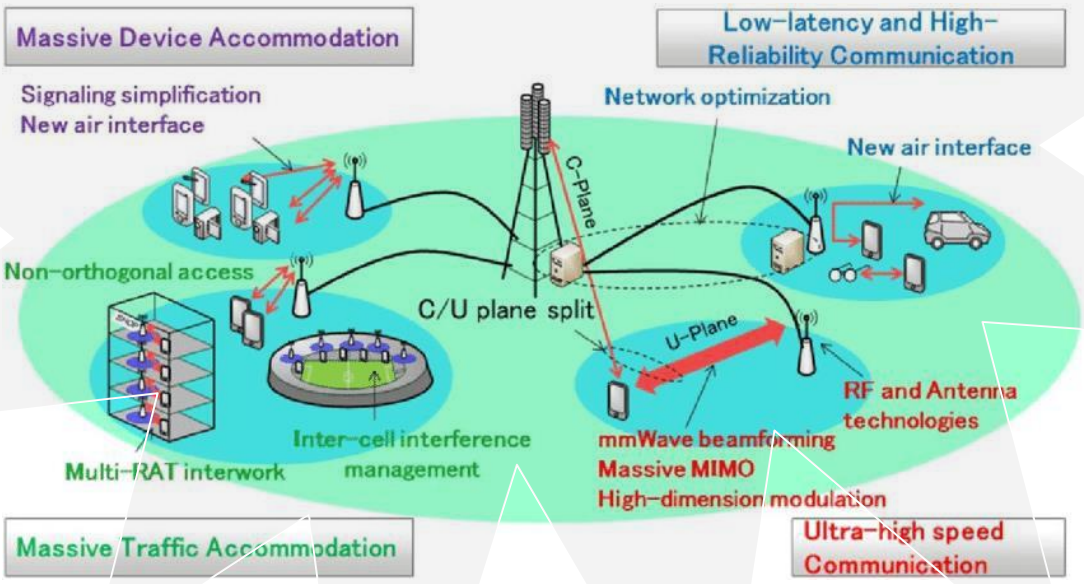
His 2001 short story "The Robot and the Baby" farcically explored the question of whether robots should have (or simulate having) emotions, and anticipated aspects of Internet culture and social networking that have become increasingly prominent during ensuing decades.

Honors and awards of John McCarthy

1. Turing Award from the Association for Computing Machinery (1971).
2. Kyoto Prize (1988).
3. National Medal of Science (USA) in Mathematical, Statistical, and Computational Sciences (1990).
4. Inducted as a Fellow of the Computer History Museum "for his co-founding of the fields of Artificial Intelligence (AI) and timesharing systems, and for major contributions to mathematics and computer science". (1999)
5. Benjamin Franklin Medal in Computer and Cognitive Science from the Franklin Institute (2003).
6. Inducted into IEEE Intelligent Systems' AI's Hall of Fame (2011), for the "significant contributions to the field of AI and intelligent systems".
7. Named as one of the 2012 Stanford Engineering Heroes.

Fifth-Generation(5G)Telecommunications Technologies

- Telecommunication providers and technology companies around the world have been working together to research and develop new technology solutions to meet growing demands for mobile data from consumers and industrial users.
- Fifth-generation (5G) mobile technologies represent the next iteration of mobile communications technologies that were designed to improve current (e.g., 3G, 4G) mobile networks.
- 5G networks are expected to provide faster speeds, greater capacity, and the potential to support new features and services.
- 5G technologies were developed to accommodate the increasing demands for mobile data (i.e., more people using more data on more devices).



Investigation on 5G Technology:

- 5G is a pillar of digital transformation; it is a real improvement on all the previous mobile generation networks.
- 5G brings three different services for end user like Extreme mobile broadband (eMBB). It offers high-speed internet connectivity, greater

bandwidth, moderate latency, UltraHD streaming videos, virtual reality and augmented reality (AR/VR) media, and many more.

- Massive machine type communication (eMTC), it provides long-range and broadband machine-type communication at a very cost-effective price with less power consumption.

- eMTC brings a high data rate service, low power, extended coverage via less device complexity through mobile carriers for IoT applications.
- Ultra-reliable low latency communication (URLLC) offers low-latency and ultra-high reliability, rich quality of service (QoS), which is not possible with traditional mobile network architecture.
- URLLC is designed for on-demand real-time interaction such as remote surgery, vehicle to vehicle (V2V) communication, industry 4.0, smart grids, intelligent transport system, etc. 5G faster than 4G and offers remote-controlled operation over a reliable network with zero delays. It provides down-link maximum throughput of up to 20 Gbps.
- In addition, 5G also supports 4G WWWW (4th Generation World Wide Wireless Web) [5] and is based on Internet protocol version 6 (IPv6) protocol.

Fifth-Generation (5G) Telecommunications Technologies

A.PULLAJI

5G Applications:

1. High-speed mobile network*: 5G is an advancement on all the previous mobile network technologies, which offers very high speed downloading speeds 0 of up to 10 to 20 Gbps.*
2. Entertainment and multimedia*: In one analysis in 2015, it was found that more than 50 percent of mobile internet traffic was used for video downloading.*
3. Internet of Things—*connecting everything: the 5G mobile network plays a significant role in developing the Internet of Things (IoT).*
4. Healthcare and mission-critical applications*: 5G technology will bring modernization in medicine where doctors and practitioners can perform advanced medical procedures.*
5. Satellite Internet*: In many remote areas, ground base stations are not available, so 5G will play a crucial role in providing connectivity in such areas.*

We spend a lot of time looking at screens these days. Computers, smartphones, and televisions have all become a big part of our lives; they're how we get a lot of our news, use social media, watch movies, and much more. Virtual reality (VR) and augmented reality (AR) are two technologies that are changing the way we use screens, creating new and exciting interactive experiences.

Virtual reality uses a headset to place you in a computer-generated world that you can explore. Augmented reality, on the other hand, is a bit different. Instead of transporting you to a virtual world, it takes digital images and layers them on the real world around you through the use of either a clear visor or smartphone.

With virtual reality, you could explore an underwater environment. With augmented reality, you could see fish swimming through the world around you.

Understanding Virtual Reality and Augmented Reality

Virtual reality

Virtual reality immerses you in a virtual world through the use of a **headset** with some type of screen displaying a virtual environment. These headsets also use a technology called **head tracking**, which allows you to look around the environment by **physically moving your head**. The display will follow whichever direction you move, giving you a 360-degree view of the virtual environment.

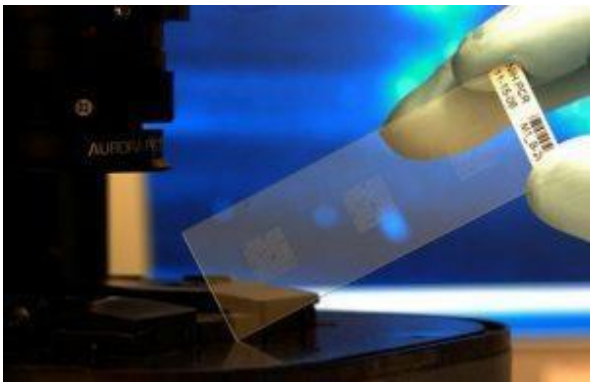
Understanding Virtual Reality and Augmented Reality

K.K PAVANI

Augmented reality

Augmented reality allows you to **see the world around you with digital images layered on top of it.** There are currently a couple of AR headsets available, including the **Microsoft HoloLens** and the **Magic Leap**. However, they are currently more expensive than VR headsets, and are marketed primarily to businesses.

A biochip is a set of diminished microarrays that are placed on a strong substrate that allows many experiments to be executed at the same time to obtain a high throughput in less time. This device contains millions of sensor elements or biosensors. Not like microchips, these are not electronic devices. Each and every biochip can be considered as a microreactor that can detect a particular analyte like an enzyme, protein, DNA, biological molecule or antibody. The main function of this chip is to perform hundreds of biological reactions in a few seconds like decoding genes (a sequence of DNA).



Biochip

Components of BioChips:

The Biochip comprises two components namely the transponder as well as reader.

Transponder :

Transponders are two types' namely active transponder and passive transponder. This is a passive transponder which means that it doesn't contain any of its own energy or battery whereas in passive, it is not active until the operator activates it by giving it a low electrical charge. This transponder

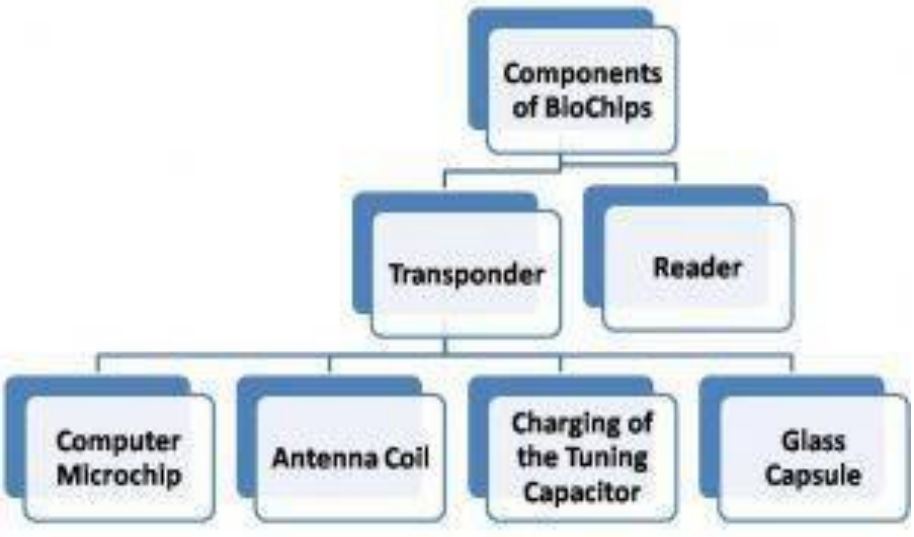
Understanding Virtual Reality and Augmented Reality

B.GEETHIKA POORNIMA

consists of four parts such as antenna coil, computer microchip, glass capsule, and a tuning capacitor.

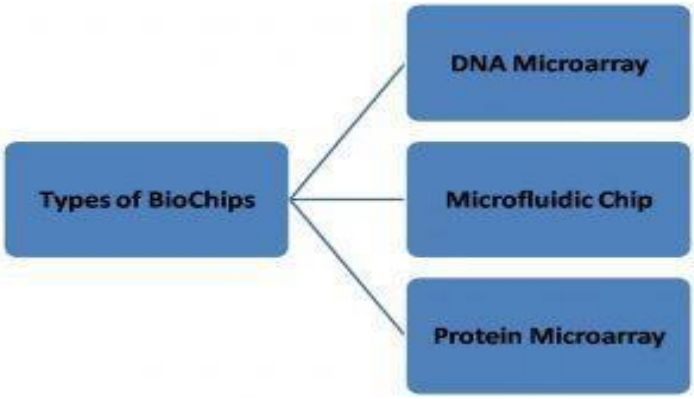
2) Reader :

The reader comprises of a coil namely “exciter” and it forms an electromagnetic field through radio signals. It offers the required energy (<1/1000 of a watt) to activate the biochip. The reader carries a receiving coil for receiving the ID number or transmitted code sent back from the excited implanted biochip.



Types of BioChips :

There are three types of Biochips available namely DNA microarray, microfluidic chip, and protein microarray.



1) **DNA Microarray:**

A DNA microarray or DNA biochip is a set of tiny DNA spots fixed to a strong surface. A researcher utilizes to calculate the expression levels for a large number of genes. Every DNA mark comprises picomoles of particular genes which are termed as probes. These can be a short segment of a genetic material under high rigidity situations.

2) **Microfluidic Chip:**

Microfluidic biochips or lab-on-a-chip are a choice to usual biochemical laboratories and are transforming several applications like DNA analysis, molecular biology procedures, proteomics which is known as the study of proteins and diagnostic of diseases (clinical pathology).

3) **Protein Microarray**

A protein microarray or protein chip method is used to follow the actions as well as connections of proteins, and to find out their function on a large scale. The main advantage of protein microarray is that we can track a large number of proteins in parallel. This protein chip comprises of a surface for supporting like microtitre plate or bead, nitrocellulose membrane, the glass slide. These are automated, rapid, economical, very sensitive, consumes less quantity of samples.

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