



MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

Autonomous Institution – UGC, Govt. of India

Accredited by NBA & NAAC with 'A' Grade

**NIRF Indian Ranking, Accepted by MHRD, Govt. of India | Rank band-6th to 25th, National Ranking by ARIIA
Maisammaguda, Dhulapally, Secunderabad - 500 010, Telangana**

A.Y : 2020-21 VOL.1

Under
Student Chapter ISTE, CSI & Technical Association Electro Spikes

INSPERON

HALF YEARLY TECHNICAL MAGAZINE

**DEPARTMENT OF
INFORMATION TECHNOLOGY**

IT

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www.mallareddyecw.com

DEPARTMENT VISION

To emerge as a center of excellence in the department of IT is to empower students with new wave technologies to produce technically proficient and accomplished intellectual IT professionals specifically to meet the modern challenges of the contemporary computing industry and society.

Providing the students with most conducive academic environment and making them towards serving the society with advanced technologies.

Vision



DEPARTMENT MISSION

The mission of the department of Information Technology is to afford excellence education for students, in the conventional and modern areas of information technology and build up students with high-quality principled trainings, thus manifesting their global personality development.

To impart holistic technical education using the best of infrastructure, outstanding technical and teaching expertise.

Training the students into competent and confident world class professionals with excellent technical and communication skills.

To provide quality education through innovative teaching and learning process that yields advancements in state-of-the-art information technology.

To inculcate the spirit of ethical values contributing to the welfare of the society by offering courses in the curriculum design.

Mission



ABOUT THE DEPARTMENT

The Dept. of Information Technology with an intake of 180 in B.Tech Programme The programmes ensure that the student effectively meets the highest benchmarks of competence required by the industry.

The Department has state of the art laboratories with latest software's like Windows 2008, Visual Studio 2012, Eclipse, WinRunner, QTP, J2EE, .NET, Fedora & Weka Tool.

The Dept established IEEE & ISTE student chapters and department Technical Association - CYNOSURES under which it organizes National level Technical Symposium - FUTURE SASTRA and State level Technical Symposium - MEDHA every academic year and Student Development Programmes like Workshop on Web Designing, Android & its Application, ADOBE PhotoShop, Ethical Hacking and HTML5.

The Department also organizes Pre-placement training programmes on C-Skills, Java Skills and Project Based training programmes on C, C++, JAVA and Web Technologies and also organizes Intra College Student Conferences on Network Security and Data Base Management Systems and Recent Advancements in Computer Science and also organizes regular student seminar sessions of two hours per week for I - IV B.Tech student to enhance their all round performance.

The Department also offers Value added Certification Courses BEC, Microsoft and CISCO certification through Business English Certification in association with Cambridge University, London, U.K., Microsoft & CISCO Certification through Center for Development of Communication Skills, Microsoft Innovation Center and CISCO Networking Academy respectively. More than 85% of students are placed in MNC s like Campgemini, WIPRO, TCS, IBM, NTT Data, HCL, Tech Mahindra, etc. The Department also publishes the Registered Journal "International Journal of Research in Signal Processing, Computing and Communication-System design (IJRSCSD) with an ISSN: 2395-3187.

PO'S

PO1	Engineering knowledge	An ability to apply knowledge of mathematics (including probability & statistics and Mathematical Foundation of Computer science and Engineering.
PO2	Problem analysis	An ability to design and conduct experiments, as well as to analyze and interpret data including hardware and software components.
PO3	Design / development of solutions	An ability to design a complex computing system or process to meet desired specifications and needs.
PO4	Conduct investigations of complex problems	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.
PO5	Modern tool usage	An ability to use the techniques, skills and modern engineering tools necessary for engineering practice.
PO6	The engineer and society	An ability to understanding of professional, health, safety, legal, cultural and social responsibilities.
PO7	Environment and sustainability	The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental and demonstrate the knowledge need for sustainable development.
PO8	Ethics	Apply ethical principles, responsibility and norms of the engineering practice
PO9	Individual and team work	An ability to function on multi-disciplinary teams.
PO10	Communication	An ability to communicate and present effectively
PO11	Project management and finance	An ability to use the modern engineering tools, techniques, skills and management principles to do work as a member and leader in a team, to manage projects in multi-disciplinary environments
PO12	Life-long learning	A recognition of the need for, and an ability to engage in, to resolve contemporary issues and acquire lifelong learning

PSO'S

The graduates of the department will attain:

PSO1: The ability to analyze a problem, design algorithm, identify and define the computing requirements within realistic constraints in multidisciplinary areas by understanding the core principles and concepts of Information Technology

PSO2: Knowledge of data management system like data acquisition, big data so as to enable students in solving problems using the techniques of data analytics like pattern recognition and knowledge discovery.

PSO3: Effectively integrate IT based solutions into the user environment.

PEO'S

PEO1

- Apply current industry computing practices and emerging technologies to analyze, design, implement, test and verify IT based solutions to real world problems.

PEO2

- To produce employable graduates who will be placed in various engineering positions in the computational world in firms of international repute.

PEO3

- To pursuit of advanced degrees in engineering at different levels of research and consultancy. They get exposed to several other domains resulting in lifelong learning to broaden their professional knowledge.

PEO4

- Use theoretical and practical concepts of various domains to realize new ideas and innovations, entrepreneurship, employment and higher studies.

MESSAGES

Founder Chairman's Message



Ch. Malla Reddy

Founder Chairman, MRGI
Hon'ble Minister, Govt. of Telangana
State

MRECW has made tremendous progress in all areas and now crossing several milestones within a very short span of time and now I feel very happy to know that the students and faculty of the IT department of MRECW are bringing out the volume-1 of the Technical magazine INSUPERON in A.Y 2020-21. As I understand this magazine is intended to bring out the inherent literary talents in the students and the teachers and also to inculcate leadership skills among them. I am confident that this issue will send a positive signal to the staff, students and the persons who are interested in the educational and literary activities

Principal's Message

I congratulate the department of IT, MRECW for bringing out the first issue of the prestigious half yearly department technical Magazine INSUPERON under A.Y: 2020-21, I am sure that the magazine will provide a platform to the students and faculty members to expand their technical knowledge and sharpen their hidden literary talent and will also strengthen the all round development of the students. I am hopeful that this small piece of literary work shall not only develop the taste for reading among students but also develop a sense of belonging to the institution as well. My congratulations to the editorial board who took the responsibility for the arduous task most effectively. I extend best wishes for the success of this endeavor.



Dr. Y. Madhatee Latha

Principal

HOD'S MESSAGE

The contributions of academicians, students, and other team members of an institution are published in a magazine. It is my pleasure to congratulate the editorial team for bringing out a quality Technical Magazine. This magazine is a nice blend of beautiful and ground-breaking articles. It has focused on delivering information to students and satisfying their need for knowledge updates. This magazine consists of mixture of exquisite articles and unique ideas from faculty and new-age Information Technology students. I am confident that the magazine's informative articles and new concepts will be appealing and valuable to the readers. Reading this technical magazine will undoubtedly inspire and motivate all students and employees to contribute even more to future issues. The goal of the magazine is to keep a varied readership informed, engaged, inspired, and educated on breakthroughs in the field of Information Technology. I am delighted to congratulate the editorial team for their efforts in publishing this Magazine. I take this opportunity to express my sincere thanks to all the members of the faculty and students of IT Department for their sincere involvement and contribution.



Dr. K. Jayarajan

HOD

FACULTY ARTICLES

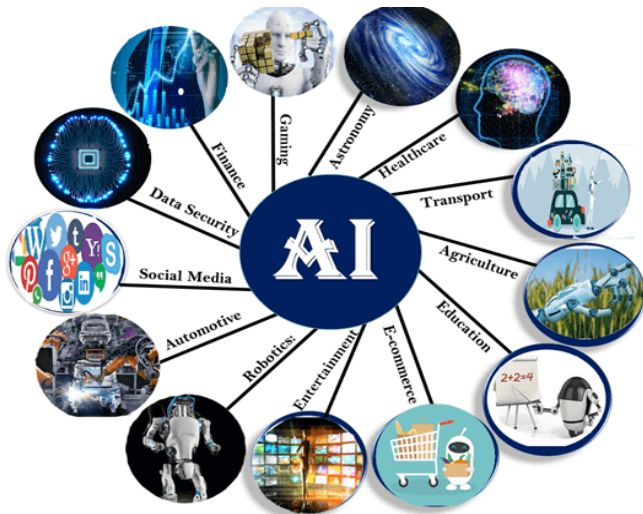
Machine Learning in Agriculture

Machine learning has emerged with big data technologies and high-performance computing to create new opportunities for data intensive science in the multi-disciplinary agri-technologies domain. In this article, we present a comprehensive review of research dedicated to applications of machine learning in agricultural production systems. The works analyzed were categorized in (a) crop management, including applications on yield prediction, disease detection, weed detection crop quality, and species recognition; (b) livestock management, including applications on animal welfare and livestock production; (c) water management; and (d) soil management. The filtering and classification of the presented articles demonstrate how agriculture will benefit from machine learning technologies. By applying machine learning to sensor data, farm management systems are evolving into real time artificial intelligence enabled programs that provide rich recommendations and insights for farmer decision support and action.



Mr.K.Kumaraswamy
Asst.Professor

Artificial intelligence with continuous innovations



Artificial Intelligence is the advancement of computer systems capable of accomplishing tasks that require intelligence. These tasks include decision-making, speech and emotion-recognition and visual perception etc.

Artificial intelligence has been continuously gaining influence in different sectors, even in business, by innovation to learn specific tasks with minimal command or input.

Changes in communication:

Development in communication technology and the integration of AI into systems of communication has led to leaps of improvements in speech recognition and translation. Access to data and powerful computing capacity is available for your communication needs. Apps equipped with powerful microchips can “hear” and translate words of a different dialect or language while in a conversation.

Changes in security:

Cyber security is a big concern nowadays. AI-enabled software assists in identifying vulnerabilities in a network effectively adjust to combat attacks, and provide solutions to counter with proper defense strategies. The role of AI in cyber security is also extensive to secure the systems.

AI is meant to make life better:

We have only touched the surface of what AI can accomplish. But it essential to realise that AI is meant to make our lives better. It can be considered a tool to assist us to rise the above circumstances. In the emergence of AI technology, we may need to adapt the reassess ourselves. We will need to be equipped skills-wise and knowledge-wise on how to handle and prosper in a world that is continuously changing and improving as days move on.

P.DEVENDAR
ASSISTANT PROFESSOR



STUDENT ARTICLES

TENSOR HOLOGRAPHY

Tensor Holography could enable the creation of real-time holograms for virtual reality, 3D printing, medical imaging, and more – and it can run on a smartphone.

Tensor Holography synthesizes a 3D hologram with per-pixel depth from a single RGB-3D image in real-time as holography is making a big comeback thanks to AI in joining forces with deep learning that will enhance the virtual world experience.

For the holograms to be high quality, many data points require transference at high speeds. 5G promises high transfer rates soon, but deep learning assures the entire process can be efficient enough. The VR's biggest challenge is its pressure on the user's eye, as the illusions of 3D viewing of VR can result in nausea and eye strain. The solution for better 3D visualization lies within 60-year-old technology, remade for the digital world: holograms.

Holograms deliver an exceptional representation of 3D world around us. Plus, they're beautiful. Holograms offer a shifting perspective based on the viewer's position, and they allow the eye to adjust focal depth to alternately focus on foreground and background.

PATAKOTA SANJANA
(18RH1A1244)



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. With RPA, software users create software robots, or “bots”, that can learn, mimic, and then execute rules-based business processes. RPA automation enables users to create bots by observing human digital actions.

RPA solutions save companies time and money while enhancing productivity by allowing associates to focus on mission-critical work. RPA has the ability to both minimize errors and improve efficiency, and, moving forward, will be critical for creating a seamless operational environment. Repetitive work will be accomplished more quickly and efficiently, so humans can be free to focus on more human-centric strengths such as reasoning, judgment, and emotional intelligence.

P.DEEPIKA
(18RH1A1246)



AQUA COMMUNICATION SYSTEM USING MODEM

Wireless communication technology is nothing new to us in this era and the idea of wireless undersea communication seems pretty interesting and new. The researchers have been designing methods for wireless information transmission underwater and a lot of progress has been made in recent years by the scientists. It is built using sensor networks by using the application of seismic monitoring which may include underwater construction, pipeline, and leak monitoring, biological data collection, or underwater robot communication. The sensor networks usually consist of many battery-powered nodes, densely deployed in an area for close observation and long-term monitoring. The submerged acoustic channel presents solid challenges to the plan of information communication systems. Other than extreme multi-path reflections, there can be bended engendering ways due to uneven temperature dissemination and different impedances, such as bubbles and clamor from

man-made objects. The modem hardware is split into three main portions: a wake-up receiver, a data receiver, and a single transmitter. underwater acoustic networks will find application in more complex, heterogeneous systems for ocean observation. Below figure shows the concept of a deep-sea observatory. At the core of this system is an underwater cable that hosts a multitude of sensors and instruments, and provides high-speed connection to the surface.

T.RAMYA SRI
(18RH1A1247)



SMART CARD

The smart card is a regular credit card sized card with the microchip integrated on it and the smart card is made up of plastic and the integrated chip in it is capable of saving information and also it carries the information between the users. The data of the card can be transferred through a reader which is a component of a computer system.

Contact Vs contactless: The smart card has integrated microprocessors and requires energy to work, along with it the smart cards have some techniques to exchange the information, receiving the information, and transmitting the information. Few smart cards consist of golden plates and contact pads at the corner of the card, this category of the smart cards are known as the contact smart cards. The plates present at the corner of the card supply the required amount of energy and for exchanging the information through direct electrical contact with the help of a reader. The contact pad will not be present on few smart cards and in such cards, the connection between a reader and the card will be created through radiofrequency.

The contactless cards do not need a reader and they have a serial interface and an antenna will be present which is used to connect the card.

2. Memory Vs microprocessor: The usual and the affordable smart cards are the memory cards and they have the non-volatile memory and the electrically erasable programmable read-only memory i.e. EEPROM. As it is a non-volatile memory, if we displace the card from the reader or have issues with the power like power cut then the card saves the information.

The microprocessor cards are similar to the computers and they contain the RAM, ROM, and EPROM with the 8-bit microprocessor or the 16-bit microprocessor.

SAHITHI KONDURI
(18RH1A1248)



DIGITAL RUPEE

Digital currency or rupee is an electronic form of money, that can be used in contactless transactions. The Central Bank Digital Currency (CBDC) will be a digital currency issued by the central bank, i.e. the Reserve Bank of India (RBI) and it will be based on Block Chain and other technologies. One of the main reasons why the RBI is going to launch a digital rupee is that India doesn't want to miss the virtual currency bandwagon.

A digital rupee will be fundamentally different from private cryptocurrencies like Bitcoin because it will be backed by the state and will have an intrinsic value. The government has called Bitcoin and other cryptocurrencies virtual assets, which means they will not be legal tender and digital rupee will be counted as currency in circulation.

A large part of transactions in India's economy are still carried out using untraceable cash, this can be replaced by digital rupee.

Thus it can be concluded that the digital rupee will replace physical cash. It is an online token and has no physical presence and it is a perfect replacement of cash for an economy.

SHAIK NAUSHEEN NASREEN
(18RH1A1250)



RADAR BULLET

Radar bullet is a special type of bullet the main use of radar bullet is to find landmines without setting foot into the ground. This consists of firing a special bullet into ground from a helicopter which could pinpoint buried landmines. Anti -personal mines claims seventy new victims every day. This weapon is particularly cruel on children whose bodies being smaller and closer to the blast are more likely to sustain serious injury. The severe disabilities and psychological trauma that follow the blast mean these children will have to be looked after for many years. Technologies are used for landmine detection are: Metal detectors--- capable of finding even low-metal content mines in mineralized soils. Nuclear magnetic resonance, fast neutron activation and thermal neutron activation. Thermal imaging and electro-optical sensors--- detect evidence of buried objects. Biological sensors such as dogs, pigs, bees and birds. Chemical sensors such as thermal fluorescence detect airborne and waterborne presence of explosive vapors.

JYOTHIKA MANADALA
(19RH1A12A1)



VOICE SEARCH TECHNOLOGY

The Voice Search allows users to speak into a device rather than typing keywords for a search query to generate results. This technology trend uses speech identification to understand what a user is saying with high accuracy and then delivers the result through voice to the user.

For a long time, voice search technology has been in the tech market, software like speech-to-text and voice dialing are some excellent examples of voice search and as we have discussed above, devices like Amazon Echo use voice search as their main functionality and due to these extensive features, this technology trend improves the user experience to the fullest – and because of this, by the year 2020, 50% of all online searches will be made through voice search technology

M.HEMA HARITHA

(19RH1A12A2)



VERTICAL FARMING

As the population is rising rapidly and the farmers are decreasing it has become tough to feed the world. The costs of food are increasing and the quality and quantity of food being produced is decreasing. There is huge shortage of food and many people are dying from hunger.

Vertical Farming is the practice of growing crops vertically in stacked layers. This comes in different shapes and sizes. This can be a simple wall mounted system to a large warehouse storage.

Vertical farming is of three types

1. Hydroponic-It involves growing plants in nutrient solutions.
2. Aeroponic-It involves growing plants in the air or mist with no soil and very less water.
3. Aquaponic-It involves growing plants in the aquariums so that the nutrients can be collected from the urea of aquatic animals and the aquarium can also be purified by those plants.

Compared to traditional farming vertical farming has many advantages such as it can't be affected by external environment such as heavy rains, floods, droughts, high temperatures, pests, insects, rats, birds etc. vertical farming is safer than traditional farming and has high probability that harvest is of good quality and quantity as there is no external threat and no need of pesticides, insecticides etc to protect from that threat.

SHREYA MEDICHERLA

(19RH1A12A9)



ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

Machine learning (ML) and artificial intelligence (AI) are becoming dominant problem-solving techniques in many areas of research and industry, not least because of the recent successes of deep learning (DL). However, the equation $AI=ML=DL$, as recently suggested in the news, blogs, and media, falls too short. These fields share the same fundamental hypotheses: computation is a useful way to model intelligent behavior in machines. What kind of computation and how to program it? This is not the right question. Computation neither rules out search, logical, and probabilistic techniques, no

(deep) (un)supervised and reinforcement learning methods, among others, as computational models do include all of them. They complement each other, and the next breakthrough lies not only in pushing each of them but also in combining them.

Artificial intelligence (AI) brings with it a promise of genuine human-to-machine interaction. When machines become intelligent, they can understand requests, connect data points and draw conclusions. They can reason, observe and plan. The field has a long history rooted in military science and statistics, with contributions from philosophy, psychology, math and cognitive science. Artificial intelligence originally set out to make computers more useful and more capable of independent reasoning.

MEENI TARUNI
(19RH1A12B0)



ROBOTIC PROCESS AUTOMATION (RPA)

Robotic process automation (RPA) is a software technology that makes it easy to build, deploy, and manage software robots that emulate humans actions interacting with digital systems and software.

Just like people, software robots can do things like understand what's on a screen, complete the right keystrokes, navigate systems, identify and extract data, and perform a wide range of defined actions.

But software robots can do it faster and more consistently than people, without the need to get up and stretch or take a coffee break.

Benefits for Business:

Robotic process automation streamlines workflows, which makes organizations more profitable, flexible, and responsive. It also increases employee satisfaction, engagement, and productivity by removing mundane tasks from their workdays.

RPA is noninvasive and can be rapidly implemented to accelerate digital transformation. And it's ideal for automating workflows that involve legacy systems that lack APIs, virtual desktop infrastructures (VDIs), or database access.

SNEHA MOTLAKUNTA
(19RH1A12B6)



LICKABLE TELEVISION

The lickable television concept developed in Japan will allow viewers to taste food right from the screen. The lickable TV comes with a supposedly hygienic film that is laid over the screen on which flavors are sprayed. The device is called “Taste the TV” and was developed by a Japanese professor. The lickable television is developed by Meiji University professor Homei Miyashita who says that the television was built to help people experience food flavors from across the world while sitting in the comfort of their own home. The professor who works with a team of 30 students has developed multiple flavor related products including a fork that is supposed to help make the food taste better. He has also offered technology firms to use his spraying technique and develop products that can make toasted bread taste like a slice of pizza or chocolate. While this is just the prototype, this technology when commercially available can provide a unique sensory experience to its users. It can be used by culinary shows to teach students from across the world remotely.

PREETHI MUDDANGULLA
(19RH1A12B7)



RECURRENT NEURAL NETWORKS(RNN)

A Recurrent Neural Network is a type of artificial neural network commonly used in speech recognition and natural language processing. Recurrent Neural Network recognize data's sequential characteristics and use patterns to predict next likely scenario. A recurrent neural network is an extension of a conventional feedforward neural network, which is able to handle a variable-length sequence input. The reason that RNN can handle time series is that RNN has a recurrent hidden state whose activation at each time is dependent on that of the previous time. Long short-term memory units are one type of RNN, which make each recurrent unit to adaptively capture dependencies of different time scales. LSTMs have cell and forget gate to modulate the flow of information. Recurrent neural networks leverage backpropagation through time algorithm to determine the gradients, which is slightly different from traditional backpropagation as it is specific to sequence data. The principles of BPTT are the same as traditional backpropagation, where the model trains itself by calculating errors from its output layer to its input layer. Recurrent neural networks are particularly good in the processing sequence of data, like music, audio, video, speech recognition, that is predicting the pattern in time series. A single time step of the input is provided to the network. Then calculate its current state using set of current input and the previous state. Once all the time steps are completed the final current state is used to calculate the output. The output is then compared to the actual output that is the target output and the error is generated. The error is then back-propagated to the network to update the weights and hence the network is trained.

M. SAI SANGAVI
(19RH1A12B8)



GENERATIVE ADVERSARIAL NETWORKS

Generative Adversarial Networks uses unsupervised language. It contains training data in the form of numbers from 0 to 9, which recognizes and generates output based on training data. Generative models are able to generate new examples from samples which are not only same but also creative. It was developed by Ian Good Fellow in the year 2014 and standard theory was developed by Alec Radford in the year 2016. It contains two neural networks which compute each other : Generator and Discriminator. Discriminator is trained with set of real images and a set of fake images and it needs to identify the differences between real images and fake images.

M. SAI VARSHANI
(19RH1A12C0)



3D TELEVISION

3D television (3DTV) is television that conveys depth perception to the viewer by employing techniques such as stereoscopic display, multi-view display, 2D-plus-depth, or any other form of 3D display. Most modern 3D television sets use an active shutter 3D system or a polarized 3D system, and some are autostereoscopic without the need of glasses. As of 2017, most 3D TV sets and services are no longer available.

The future of 3D television is also emerging as time progresses. New technology like WindowWalls (wall-size displays) and Visible light communication are being implemented into 3D television as the demand for 3D TV increases. Scott Birnbaum, vice president of Samsung's LCD business, said that the demand for 3D TV would skyrocket in the next couple of years, fueled by televised sports (but this did not happen). One might be able to obtain information directly onto their television due to new technologies like the Visible Light Communication that allows for this to happen because the LED lights transmit information by flickering at high frequencies.

VAISHNAVI JAKKULA
(19RH1A1265)



LI-FI

LiFi (light fidelity) is a bidirectional wireless system that transmits data via LED or infrared light. It was first unveiled in 2011 and, unlike wifi, which uses radio frequency, LiFi technology only needs a light source with a chip to transmit an internet signal through light waves.

Wi-Fi(wireless fidelity) and Li-Fi(light fidelity) both are two different technologies which are used to send and receive data wirelessly. In case of Wi-Fi we use Routers and Radio Frequency (RF) waves to transmit data, whereas in Li-Fi we use LED bulbs and Light signals to transmit and receive data.

LiFi signals can be defined by the area of illumination, which means interference is much simpler to avoid and even stop altogether. This also means LiFi can be used in RF hostile zones such as hospitals, power plants and aeroplanes.

LiFi transmits data through light waves on the electromagnetic spectrum, so is completely free from harmful radiofrequency radiation.

LiFi is also very secure because, unlike WiFi, it cannot pass through walls. Data exchange would remain confined to lit areas, thus putting an end to the threat of hackers.

KALYANAPU SAI MAHIMA
(19RH1A1269)



BRAIN COMPUTER INTERFACE

Brain–computer interfaces (BCIs) measure brain activity, extract features from that activity, and convert those features into outputs that replace, restore, enhance, supplement, or improve human functions.

BCIs may replace lost functions, such as speaking or moving. They may restore the ability to control the body, such as by stimulating nerves or muscles that move the hand. BCIs have also been used to improve functions, such as training users to improve the remaining function of damaged pathways required to grasp. BCIs can also enhance function, like warning a sleepy driver to wake up. Finally, a BCI might supplement the body’s natural outputs, such as through a third hand.

G. LEHA
(20RH1A1254)



FINGERPRINTTECHNOLOGY

Fingerprint recognition is the process of the verification of a person's identity by comparing their fingerprints with previously recorded samples. Fingerprints are impressions of human fingers, consisting of a series of ridges and grooves. Fingerprints captured in the system are located by minutiae points – points at which scars begin or terminate. These are further mapped with lines between them, creating a minutiae template.

The feature extractor was designed to work well with low quality and partial fingerprint images. Fingerprint image quality can be degraded due to less than optimal conditions during acquisition. The algorithm is able to considerably enhance the overall image quality and to fix possible defects in a way that these will not alter the recognition process. These advanced image enhancement techniques have a significant impact on the overall accuracy of the system.

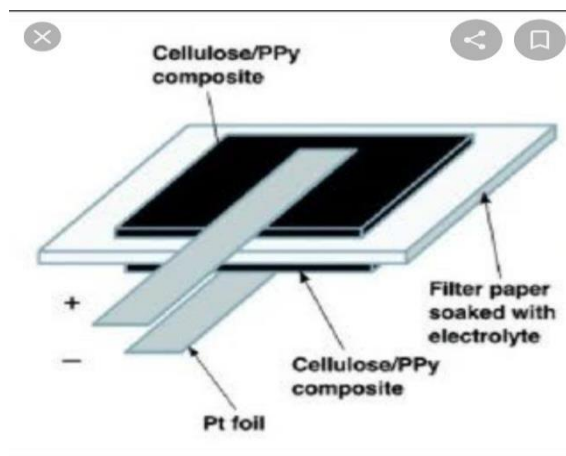
ALLURI SRI RUPA
(20RH1A1208)



PAPER BATTERY

A **paper battery** is engineered to use a spacer formed largely of cellulose (the major constituent of paper). It incorporates nanoscopic scale structures to act as high surface- area electrodes to improve conductivity.

In addition to being unusually thin, paper batteries are flexible and environmentally- friendly, allowing integration into a wide range of products. Their functioning is similar to



conventional chemical batteries with the important difference that they are non-corrosive and do not require extensive housing.

A.GEETHIKA
(20RH1A1209)



IMPORTANT WEBSITES

www.ieee.org/india

www.engineering.careers360

www.technologyreview.com

www.mathworks.in/products/matlab/

www.microwaves101.com/

www.ece.utoronto.ca/student-life-links

<https://www.ece.org/>

[Science Commons.org](http://ScienceCommons.org)

[MathGV.com:](http://MathGV.com)

<http://www.engineeringchallenges.org/>

<http://engineering.stanford.edu/announcement/stanford-announces-16-online-courses-fall-quart>

<http://www.tryengineering.org/>

<http://www.engineergirl.org/>

<http://www.discoverengineering.org/>

<http://www.eng-tips.com/>

<http://efymag.com>

<http://efymagonline.com/>

<http://electronicsforu.com>

www.dspguide.com

www.howstuffworks.com

<http://nptel.iitm.ac.in>

<http://www.opencircuitdesign.com/>

<http://www.futuresinengineering.com/>

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