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.2

Under
Student Chapter ISTE, CSI & Technical Association Electro Spikes

INSPERON

HALF YEARLY TECHNICAL MAGAZINE

DEPARTMENT OF INFORMATION TECHNOLOGY

IT

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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 MISION

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, Ecllipse, 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 actives 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 sloving 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

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-2 of the Technical magazine INSPERON 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

Ch. Malla Reddy

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

Principal's Message

I congratulate the department of IT, MRECW for bringing out the first issue of the prestigious half yearly department technical Magazine INSPERON 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. Madhavee 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

Snowflake

Snowflake is a cloud data warehouse that pulls data from a wide range of software, services, and computing platforms. What makes Snowflake different is its ability to scale compute and storage independently! Snowflake has more than 4,900 customers, including 212 of the Fortune 500 with tons of jobs available on the job portals. The average salary for a Snowflake Datawarehouse Engineer is 15 Lakhs per annum in India, and in the US it's 125,000$ per year.Snowflake's Data Cloud is powered by an advanced data platform provided as Software-as-a-Service (SaaS).

Snowflake enables data storage, processing, and analytic solutions that are faster, easier to use, and far more flexible than traditional offerings.The Snowflake data platform is not built on any existing database technology or "big data" software platforms such as Hadoop. Instead, Snowflake combines a completely new SQL query engine with an innovative architecture natively designed for the cloud. To the user, Snowflake provides all of the functionality of an enterprise analytic database, along with many additional special features and unique capabilities.Snowflake runs completely on cloud infrastructure. All components of Snowflake's service (other than optional command line clients, drivers, and connectors), run in public cloud infrastructures.Snowflake uses virtual compute instances for its compute needs and a storage service for persistent storage of data. Snowflake cannot be run on private cloud infrastructures (on-premises or hosted).Snowflake is not a packaged software offering that can be installed by a user. Snowflake manages all aspects of software installation and updates.

C. RAJEEV

Associate Professor

Artificial Intelligence:

Artificial intelligence (AI) centers on machine coding that mimics human and animal intelligence. AI professionals develop algorithms and program machines to perform humanlike tasks. Already ubiquitous, AI helps detect credit card fraud, identify disease outbreaks, and optimize satellite navigation.

In their annual technology prediction report, the Institute of Electrical and Electronics Engineers Computer Society predicts several AI concepts will be widely adopted in 2021. Computing developments in AI purportedly include reliability and safety for intelligent autonomous systems, AI for digital manufacturing, and trustworthy and explainable AI and machine learning.

Computer and information research scientists, one potential AI career, earned a median annual salary of $126,830 as of 2020, with the BLS projecting much-faster-than-average growth for the profession from 2019 to 2029.

Mr.T.SasiVardhan
Associate Professor

STUDENT ARTICLES

BLADE SERVER

A blade server is a high density server and is a compact device containing a computer used to manage and distribute data in a collection of computers and systems this is called as a network.

It consists of a box like structure, housing multiple thin, modular electronic circuit boards, known as server blades. Each blade contains a single server. The information within blade servers is stored on a memory card or other memory device. The individual blades contain processors, integrated network controllers, memory and input/output ports. The benefits of this blade server is low power consumption, compact size, high-trust compatibility. Together, blades and the blade enclosure form a blade system.

V.SAI PRASEEDA
(18RH1A1255)

FOLKCOMPUTING

Folk Computing technology is designed to help build community in informal, face-to-face settings by giving users a playful way of revealing shared assumptions and interests. Drawing on the communicative process of folklore, Folk Computing devices facilitate the creation, circulation and tracking of new, digital forms of lore. These digital folklore objects serve as social probes: they circulate among people with whom they resonate, thereby revealing the boundaries of groups who share the underlying beliefs, knowledge and experiences that give the lore meaning.

Folk Computing uses technology to enhance the community building functions of folklore in three important ways: it supports the circulation of more interactive and media-rich lore, it reduces the social and cognitive costs of folklore creation and circulation, and it enables detailed visualizations of how pieces of lore circulate through a community. This thesis will explore the potential of Folk Computing through a design rationale for three new technologies, ranging from computationally augmented name tags used at conferences (the Thinking Tags and Meme Tags) to devices with which people can create, trade and track animations and simple games (the i-balls).

V.KSHETHRIKA
(18RH1A1257)

SMART EYE TECHNOLOGY

Eye-tracking is the phenomena in which movements of the eye and its gaze are captured. This technology was founded in 1999 by a Swedish high-tech companylocated in Gothenburg. In Smart eye technology, there is a continuous evaluation of allsocial platforms which eradicates all the possible measures or ways of the unwantedviewer to poke at your screen.When we are at a public place and have to see someconfidential documents, the smart eye helps you to keep its access only to your eye.With its biometric screen protection.

This can helpwhen developing websites or displaying information. If we look at the negative side of it,the biggest disadvantage of eye-tracking technology is that not all eyes can be tracked e.g. Contact lenses, glasses, and pupil color can all impact the eye-tracking camera's ability to record eye movements. Another problem in this technology is that calibrating the instruments /equipment takes time which may cause the user to deviate from using the device.

Y.KRISHNAVENI
(18RH1A1260)

METAVERSE

The Metaverse PowerPoint Template contains nine slides of scene illustrations, concept diagrams, and a timeline. An ultra-modern presentation design with 3D shapes gives an effect of virtual reality mode. The metaverse PowerPoint presentation template shows a man in VR goggles interacting with the virtual environment in the cover slide.The four steps fluid diagram presents a timeline of digital space and technology. You can use the editable diagram template to explain different process flow concepts. The mixed reality convergence slide displays a vertical infinite loop diagram design. It helps display a merge of technologies such as VR/AR, 5G/6G, Blockchain/ NFT, and Cloud Computing. Alternatively, you can combine this Metaverse template with other AI slides and Robotics PowerPoint templates.

The Slides of metaverse technology scenes present cartoon illustrations of male and female users with VR Gear. The 3D blocks around user figures depict a scene from a 3D environment. The slides also include graphics of VR and augmented reality gears including VR goggles and controllers. All these graphic elements and futuristic themes of metaverse presentation are fully customizable. Users can adjust slides to present their business venture, ideas, and information about metaverse in PowerPoint.

B.KRUSHNA VENI
(19RH5A1201)

FLEET MANAGEMENT

Fleet (vehicle) management can include a range of functions, such as vehicle leasing and financing, maintenance, licensing and compliance, supply chain management, accident management and subrogation, telematics (tracking and diagnostics), driver management, speed management, fuel management, health and safety management, and vehicle re-marketing. Fleet Management is a function which allows companies which rely on transportation in business to remove or minimize the risks associated with vehicle investment, improving efficiency, productivity and reducing their overall transportation and staff costs, providing 100% compliance with government legislation (duty of care) and many more. It can be defined as the processes used by fleet managers to monitor fleet activities and make decisions from asset management and applies to any organization that uses five or more vehicles.

Fuel transaction data, maintenance repair data, individual vehicle documents such as vehicle registrations, titles, and travel permits, supply chain data including vehicle and equipment specifications, warranties, build and delivery data, and vehicle identifying data, and driver-centric data such as acceptance of fleet policies, completion of required safety training, as well as demographic data on job types, all contribute to the fleet data pool. The more specialized functions a fleet performs, the more systems and data points are involved in integration.

S.MEGHANA
(19RH5A1202)

THOUGHT TRANSLATION DEVICE

The Thought Translation Device is a direct connection between the brain and a computer. This interface can be used to communicate a process referred to as "brain-computer communication". Selfregulation of slow cortical potentials (SCPs) is used to control a cursor on a computer screen. Cursor movement occurs according to the alterations of the SCP amplitude. SCPs are used to control cursor movement for three reasons: First, their physiological origin is well understood; second, they are universally present in cortical cell assemblies; and, third, self-regulation of SCPs can be acquired by means of biofeedback and operant learning principles. An extended version of the TTD has been developed running on any MS-Windows

PC and its architecture is described. A variety of filter modules can be combined in a configurable order for online processing and feedback of physiological data.

KEERTHI DHANSHETTY
(19RH1A1276)

ARTICLE ON CRYPTOCURRENCY

You can use cryptocurrency to make purchases, but it's not a form of payment with mainstream acceptance quite yet. A handful of online retailers like Overstock.com accept Bitcoin, but it's far from the norm.

Until crypto is more widely accepted, you can work around current limitations by exchanging cryptocurrency for gift cards. At eGifter, for instance, you can use Bitcoin to buy gift cards for Dunkin Donuts, Target, Apple and select other retailers and restaurants. You may also be able to load cryptocurrency to a debit card to make purchases. In the U.S., you can sign up for the BitPay card, a debit card that converts crypto assets into dollars for purchase, but there are fees involved to order the card and use it for ATM withdrawals, for example.

K.SHRAVYA
(19RH1A1277)

MACHINE LEARNING TECHNIQUES FOR INTRUSION DETECTION

An intrusion detection system is programming that screens a solitary or a system of PC's for noxious exercises that are gone for taking or blue penciling data or debasing detection system are not ready to manage the dynamic and complex nature of the digital assaults on PC systems. Despite the fact that effective versatile strategies like different systems of machine learning can bring about higher detection rates, bring down false caution rates and sensible calculation and corresponding cost. This article is about utilization of machine learning and deep learning techniques for Intrusion Detection.

K. NITHYA
(19RH1A1280)

HADOOP

Hadoop is an opensource software programming framework which is used for storing a large amount of data and performing the computation. Its framework is based on Java programming and also with some native code in c.

Apache Software Foundation is the developers of Hadoop, and co -founders are **Doug Cutting** and **Mike Cafarella.** In October 2003 the first paper release was Google File System.

HDFS is one of the distributed file System which is defined as Hadoop Distributed File System where it divides the files into blocks and sends that particular file which is containing the

information across various nodes in the form of large clusters. Transformation of data takes place between the nodes even though there is a node failure which is one of the advantage by using HDFS.

HDFS is inexpensive, immutable in nature, ability to tolerate faults, scalable, block structured, can process a large amount of data simultaneously and many more.

K.VAISHNAVI RANI
(19RH1A1285)

PAVEGEN TECHNOLOGY

In short, it creates energy from footsteps using a unique tile based system. Pavegen is literally 'The Next Step' to make use of the power of many. Pavegen's combination of physical interactivity and rich data is helping to bring smart cities to life.

The Pavegen technology is a multifunctional custom flooring system. Pavegen's tiles are electro-magnetic. As people step on the tiles, their weight causes electric-magnetic induction generators to vertically displace, which results in a rotary motion that generates off-grid electricity. Additionally, each tile is equipped with a wireless API that transmits real-time movement data analytics, whilst directly producing power when and where it is needed. Pavegen is also able to connect to a range of mobile devices and building management systems.

AKSHAYA NARALA
(19RH1A12C6)

ULTRATHIN MATERIALS IN QUANTUM COMPUTING

Ultrathin materials lead to big advancement in Quantum Computing. Superconducting qubits are the building blocks of a quantum computer. The use of ultrathin materials to reduce the size of superconducting qubits could facilitate personally sized quantum devices.

Conventional qubit capacitors are like open-faced sandwiches, with no top plate and a vacuum sitting on top of the bottom plate to act as the insulating layer (the plates are bigger). The size of each qubit is going to increase if you put it all on one small device. When two adjacent qubits have their own electric field open to free space then there may be some unwanted conversation between them.

  So, the researchers use ultrathin materials to create the superconducting qubits which are at least one hundred the size of traditional design and suffer less interference between neighboring qubits. The researchers showed that hexagonal boron nitride, a material composed only of a few monolayers of atoms, can be stacked to form the insulator of capacitors in a superconducting qubit. This doesn't reduce the performance of qubit rather makes the capacitors smaller than generally used in qubit. The structure of these small capacitors reduces the cross-talk, which occurs when a qubit inadvertently affects the surrounding qubits. With this we can use millions of qubits in a device.

N.MANASVI
(19RH1A12C9)

NFT – THE FUTURE OF BUSINESS

NFT basically creates a block chain-based digital Certificate for digital collectibles including games, music, art and many more. This Certificate gives the artwork a unique identity. Any digital artwork (or) asset, which is available to be bought and sold online.The Underlying technology and the Programming language used by NFTs are the same as other cryptocurrencies such as blockchain. NFT majorly exists on ethereumblockchain.

However, NFT is quite different from the Cryptocurrencies. Bitcoin and Ethereum are fungible tokens which means if bitcoin or ethereum is traded for one another, they'll be having the same value (or) item in return basically money. On the other hand, NFT is a unique token. Therefore, when it is traded, something completely different will be returned. Thus, NFT has enhanced media exposure and special perks for aspiring artists. This popularity of NFT creates new opportunities for new art platforms motivating to people to buy art from internet platforms and promoting copyright of originality of digital assets.

P.POOJITHA
(19RH1A12D8)

INGESTIBLE ROBOTS

It consists of layers of structural materials with different heating properties which determine how the robot shall behave in a given condition. It also partially relies on thrust motion of stomach for proper movement.

Composed of biomaterial called biolefin (which is acquired from pig guts), it is easily ingestible, harmless to human body, and designed to hold against the acidic nature of oesophagus and operate to primarily remove the battery and consequent burns as a result of an electric discharge in stomach conditions.

A common question is whether ingesting robot would be painful, but researchers disagree. "It's similar to swallowing an ice cube" they claim. Another issue that arises; "what if it gets stuck?" Scientists are working on better magnets and origami techniques to prevent it.

PRANAVI JOSHI
(19RH1A12E3)

VIRTUAL REALITY

VIRTUAL REALITY is the illusion of a three dimensional, interactive, computer generated reality where sight, sound, and sometimes even touch are simulated to create pictures, sounds and objects that actually seem real.

VR is able to immerse you in a computer generated world of your own making: like room, city, the interior of human body. With VR, you can explore any uncharted territory of the human imagination.

In 1950s, flight simulators were built by US Air Force to train student pilots. In 1965, a research program for computer graphics called "The Ultimate Display" was laid out. In 1988, commercial development of VR began. And finally, in 1991, the first commercial entertainment VR system "Virtually" was released.

There are different types of VR:

➢ Immersive VR: Completely immerse the user's personal viewpoint inside the virtual 3D world
➢ Non-Immersive VR: Here, we have large display, but doesn't surround the user
➢ Window On World VR: Also known as Desktop VR, use of a monitor to display to visual world

Applications of VR:

➢ VR in the military: Military use VR in variety of ways to tackle different situations and focus on different strengths some of them are virtual boot camp, flight simulation, etc
➢ VR in the education: Provide learners with a virtual environment where they can develop their skills without the real world consequences of failing
➢ VR in entertainment: VR environment allows user to engage with the exhibits, concerts, museum, gallery, etc
➢ And many more…

RITIKA KOLLURI

(19RH1A12F4)

COGNITIVE COMPUTING

Cognitive computing is the creation of self-learning systems that use data mining, pattern recognition and natural language processing (NLP) to solve complicated problems without constant human oversight. It is a field that is highly transdisciplinary in nature, combining ideas, principles and methods of psychology, computer and internet technologies, linguistics, philosophy, neuroscience, etc.

The goal of the International Journal of Cognitive Computing in Engineering is to explore how these data science technologies and new cognitive methods can be integrated to address real world

engineering problems and challenge. For example, the journal welcomes submissions that look at the opportunities offered by combining existing data technologies with the knowledge of experts in the field and artificial intelligence. One of the benefits of cognitive computing is that it offers new analytics opportunities: the journal also welcomes designs for cognitive embeddnologyed data technologies that can process and analyse the large amount of data generated and aid decision-making.

SIMHARAJU SHRESTA
(19RH1A12G2)

SPECTRUM POOLING

The strategy of spectrum management is known as spectrum pooling where several radio spectrum users can coexist in a single portion of radio spectrum space. The spectrum or bandwidth of an Electromagnetic Wave is a significant, valuable, and incomplete resource that must be used very cautiously. This is a strategy for sending the RF among two systems exclusive of any clashes.
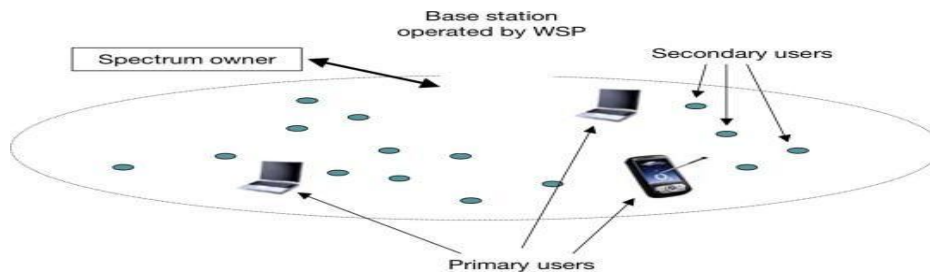
A cognitive radio-based spectrum pooling concept has been developed in. A Cognitive Radio approach for Usage of Virtual Unlicensed Spectrum (CORVUS), a vision of a cognitive radio-based approach that uses allocated spectrum in an opportunistic manner to create virtual unlicensed bands, i.e., bands that are shared with primary users on a non-interfering basis, has been proposed in. The principles of the CORVUS system are explained below.

NIKITHA BHOOMAWAR
(20RH1A1223)

BLUE PRINT

Blue brain is the name the world's first virtual brain. That means a machine can function as human brain. Today scientists are in research to create an artificial brain that can think, response, take decision, and keep anything in memory. The main aim is to upload human brain into machine.

Blueprint Technologies is an innovative, award winning, knowledge driven Enterprise Solutions Company providing end to end integrated ERP solutions in SAP products for diverse industries worldwide.

The Blue Brain Project is an attempt to reverse engineer the human brain and recreate it at the cellular level inside a computer simulation.

Goals of the project are to gain a complete understanding of the brain and to enable better and faster development of brain disease treatments. The research involves studying slices of living brain tissue using microscopes and patch clamp electrodes. Data is collected about all the many different neuron types.

MS BIRADAR SWATHI
(20RH1A1226)

HIGH SPEED PCBS

Most systems now are handling 4G and 3G PCBs. This means that components are transmitting and receiving frequencies that can range from 600 MHz up to 5.925 GHz and bandwidth channels of 20MHz, or 200kHz for IoT systems. When designing PCBs for 5G network systems, the components will need Mm-wave frequencies of 28GHz, 30GHz, and even 77GHz based on the application. For bandwidth channels, 5G systems will be dealing with 100MHz right below and 400 MHz right above 6GHz frequency
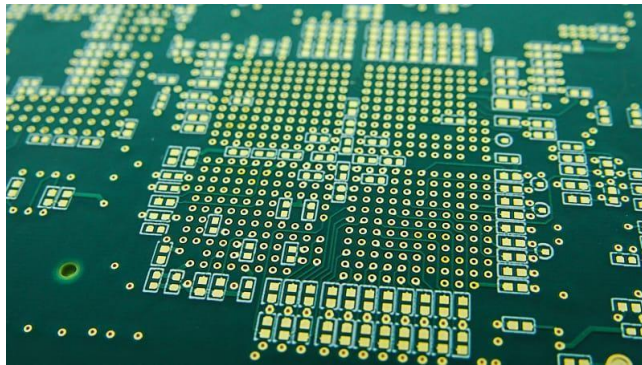
These higher speeds and higher frequencies will demand the appropriate materials within the PCB to capture and transmit both lower and higher signals at the same time without experiencing signal loss and EMI. In addition, an added problem is that the devices will become lighter, portable, and smaller. With strict weight, size, and space limitations, the PCB materials will have to be flexible and light while accommodating all the microelectronics along the board.

Thinner traces and stricter impedance control will need to be adhered to for the PCB copper tracings (Figure 2). The traditional subtractive etching processes used for 3G and 4G high-speed PCBs may be switched out for modified semi-additive processes. These modified semi-additive processes will provide more precise trace lines and straighter walls.

T.SREEJA
(20RH1A12G3)

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

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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