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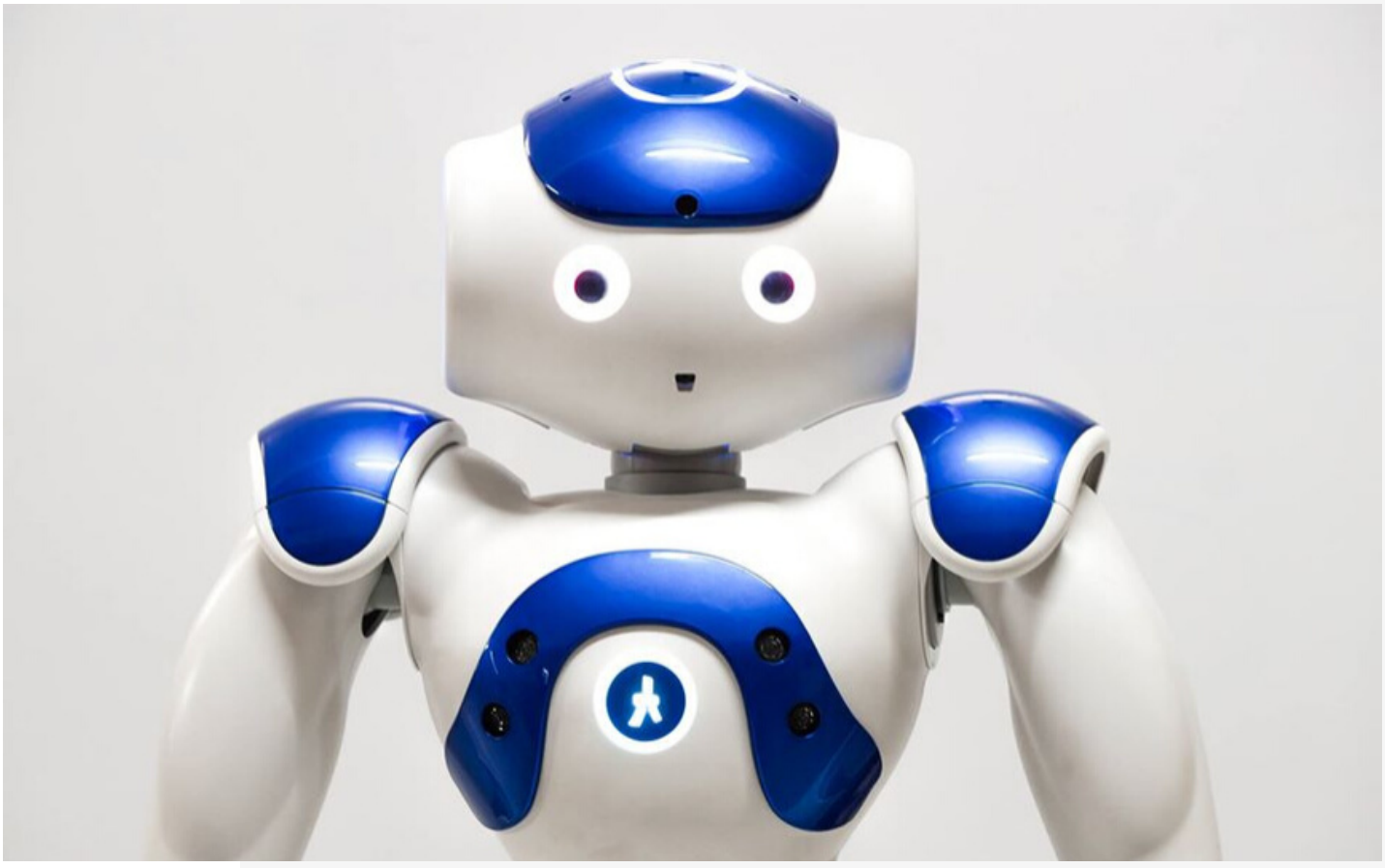

SPECIAL ISSUE ON

ROBOTICS TECHNOLOGY

DEPARTMENT OF
ELECTRONICS AND COMMUNICATION ENGINEERING

KUMARAGURU COLLEGE OF TECHNOLOGY
COIMBATORE, TAMILNADU, INDIA

TECHNOLOGY EASED THE MANAGEMENT OF COVID 19 - THE PANDEMIC



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Covid-19, popularly known as corona virus, became a global pandemic early this year. Thousands of people have been killed and/or suffering due to this viral spread across the globe. Major causalities of human lives are being registered from USA, Spain, Italy, France, Germany, Turkey, China and India amongst the 160 countries that got affected. Many countries adopted the popular mechanism of nation-wide lockdown to mitigate the spread of this virus, as it is contagious. India did adopt this mechanism on the 25th March, 2020 and is extended up to May 31, 2020. While this is the best, a populous country with limited medical facility could have done considering the veracity of the spread and infection of this virus, definitely this corona virus has brought the global and Indian economy to uncertainties. Schools and colleges have been shut down. Online education is being promoted. The corana warriors viz., doctors, nurses, paramedical personnel, police men and policy makers are working round the clock to ensure the lives through food access, safety and health care measures.

Social distancing, which primarily concerns physical distancing, has also brought work space to be looking for more efficient mechanism and technologies to roll the day-to-day business hours busy. In such situation, technology comes to our rescue to be aware, monitor and forecast situations of corona virus scenarios. For instance, the navigation based Apps (e.g Arogya Setu), drones and satellite imageries have become powerful tools in current situations.

India launched the “Arogya Setu” for tracking user’s proximity with corona patient. This app is based on bluetooth technology and location sharing functions that alerts the mobile holder to be aware of his/her proximity to the infected humans around. Within 13-days of its launch, this app has been downloaded by more than 50 million users. The Arogya Setu app has a self-testing function and provides self-quarantine instructions in eleven Indian languages. Its application is only limited within India. However, India shares its border with other countries of Indian subcontinent. Being dynamic, this App can be updated and upscaled with data from neighbouring nations as well. For example, European Union is planning to develop its own app. Apple and Google have joined hands for the development of an app for European Union to assist healthcare organizations.

COVID 19 - THE PANDEMIC (CONTINUES...)

Other conventional technologies such as trend analysis, GIS systems, hotspot monitoring are also being considered as potential options in combating the global pandemic. Tamil Nadu is using drones to disinfect hospitals partnering with a start-up, Garuda. It is pertinent to quote that the Tamil Nadu e-Governance Agency (TNeGA) has been supporting to the department of health in the form of providing data, fulfilling software update requests, and geospatial datasets.

The state of Punjab has designed the COVA app having the statistical figures of the infected people and their coordinates superimposed on the Google map. The app facilitates the issuance of the curfew pass. Punjab Govt has been planning to geo-fencing the quarantined cases with the assumptions that the quarantined people might not necessarily take the mobile with them when venturing out of the geo-fenced area.

In Odisha, the mobile app -TickMe has been becoming to keep Bhubaneswarites inside their homes and maintain social distancing during extended lockdown till May 3. In Telangana, Cyient, a global engineering and technology solutions company has provided Hyderabad Police two drones for surveillance to help implement the COVID-19 related lockdown in the city. Visuals from the drones are enabling correct decisions on moving forces to sensitive areas, which has become a popular technology being used by the corona warriors.

During this short period, where mobiles apps and drones have become popular across the nation, application of satellite imageries and GIS can be helpful post lockdown situations. In China, SpaceWill, a space and earth observation organization has documented two case studies. A satellite imagery (GF-2) shows two makeshift hospitals named Huoshenshan and Leishenshan that were built in very short time. These hospitals were built to treat confirmed infected patients intensively in Wuhan. Huoshenshan hospital started to build on January 23, 2020 and was ready to operate on February 2. The whole project with 1,000 beds was completed within 10 days in an area of 34,000 square meters. Construction of another emergency hospital named Leishenshan started on January 25, 2020 and was ready to operate on February 8. It took 14 days to build this hospital. The constructions of the two hospitals were keenly observed by SpaceWill. Satellite GF-2 shoots the building on January 30 and February 9 and recorded the quick progress clearly during the days.

As part of direct benefit transfer, the government is able to use the mobile connections for information transfer and aadhar linked bank accounts for the transfer of relief amounts being declared, as appropriate, as it also followed for quite some time for the PM-KISAN yojana. Even commodity supplies to households uses apps designed for the purpose and also the management of containment zones in the covid hotspots are managed through whatsapp groups.

In all, technology linked processes have enabled quicker and real-time outreach to many of the people to get the updates on the corona virus spread, its infection rate, casualities, safety measures and recoveries. Not to undermine the role of mass media in all these efforts who are doing the service of taking the information to the public domain and from the public domain to the policy makers. It could therefore be concluded, but for technology, India would have remained half-way down the line in combating the global pandemic, COVID-19. So, with all gratitude we remember and thank all those leaders and policy makers who promoted science and technology development in the country.

BLOCKCHAIN TECHNOLOGY
IN HEALTHCARE

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Recently, cryptocurrency has gained considerable attention throughout the world. Bitcoin is the first cryptocurrency which has received a huge success reaching 10 billion dollars in 2016. The blockchain is the underlying technology behind Bitcoin. Blockchain was first proposed in 2008 by Satoshi Nakamoto in his white paper and implemented in 2009. A Blockchain is a growing record list in which all transactions committed are stored in a chain. This chain continuously grows when new blocks are appended to it. Each block contains a cryptographic hash of the previous block, a timestamp, and transaction data. The blockchain technology has the key characteristics, such as decentralization, consistency, anonymity and auditability.

Blockchain can work in a decentralized environment, which is enabled by integrating several core technologies such as cryptographic hash, digital signature (based on asymmetric cryptography) and distributed consensus mechanism. As a result, blockchain can greatly save the cost and improve the efficiency.

Although Bitcoin is one of the most famous blockchain applications, blockchain can be applied into different applications far beyond cryptocurrencies. Healthcare is a data-intensive clinical domain where a huge amount of data are generated, accessed, and disseminated on a regular basis. Storing and disseminating this large amount of data is very important and challenging, due to the sensitive nature of data and other factors, such as security and privacy.

Recently, there has been a remarkable interest in utilizing the applications of blockchains for the delivery of safe and secure healthcare data. Focusing on quality health care services means ensuring patient health management at a superior level at all times. The major problem in providing quality healthcare services is the gap between healthcare providers and patients. The dependency of middlemen in the supply chain makes it even worse. In the healthcare sector, critical patient data and information remains scattered across different departments and systems.

Due to this, crucial data is not accessible and handily available during the times of emergency. The existing healthcare ecosystem cannot be considered complete as multiple players in the system do not have a system in place for smooth process management. Some key areas of healthcare and medicine, exhibiting the great potential of blockchain technology, are given below.

Blockchains in Electronic Health Records

The most common applications of blockchain technologies in health-care are currently in the area of electronic health records. Health data from patients are collected, encrypted and stored in the blockchain. Encrypted health recommendations are displayed to the patients when needed.

BLOCKCHAIN TECHNOLOGY IN HEALTHCARE (CONTINUES...)

Blockchains in Medical Fraud Detection

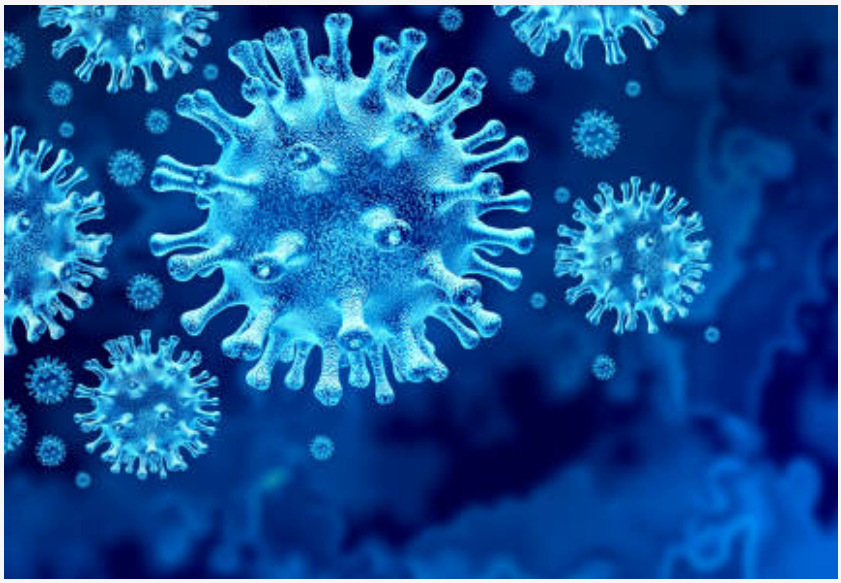
One huge application of blockchains in medical industry includes medicinal drug supply chain management. Supply chain management is a crucial issue to safeguard in all sectors, but it has a greater importance in healthcare, due to its increasing complexity. This is because any compromise to the healthcare supply chain affects the wellbeing of a patient.

Blockchains in Pharmaceutical Industry and Research

The pharmaceutical industry is one of the fastest-growing, and is a dominant sector in the healthcare delivery. The pharmaceutical sector not only helps in the introduction of new and potential drugs into the market, but also assists in ensuring the safety and validity of medical products and drugs sold to the end consumer. Blockchain, using its power of detailed tracing, keeps eye on every stage of the pharmaceutical supply chain: The origin of the medicine, its components, and ownership are frequently detected at each stage to avoid the forging/stealing of goods.

Blockchain technology provides the healthcare industry numerous benefits. Like the internet revolutionized healthcare and telemedicine, the blockchain technology is likely to take medical field to the next level in the future, by reducing the costs of monitoring, configuration, and having a central server for data, and for the administration managing the medical data. Due to their ability to access original, accurate, and reliable source-documented data in real time, doctors will not have to worry about the patient giving them an honest medical history and any possible medical history errors. Furthermore, due to data accessibility, patients will not have to worry about having a second opinion from another doctor. As suggested by Richie Etwaru at a book launch in 2016, this coming period can be called Freedom-As-A-Service.

ANNOUNCEMENT



THE NEXT ISSUE
WILL BE LOADED WITH

COVID-19

Experiences, Challenges and Opportunities

FUTURE ROBOTICS WITH ROS

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Robotics industry at present is in the verge of a transition due to the advancements in the field of machine learning and artificial intelligence as well as in embedded hardware technology. Complex mathematical problems involve in Simultaneous Localization and Mapping (SLAM) are solving in real-time application with today's embedded hardware technology. Majority of the researchers are working to develop smart robots which will adapt to any new environments which is expected to reduce the development cost and also increase the productivity. Robot Operating System (ROS) is one such software which provides flexibility to develop smart robots.

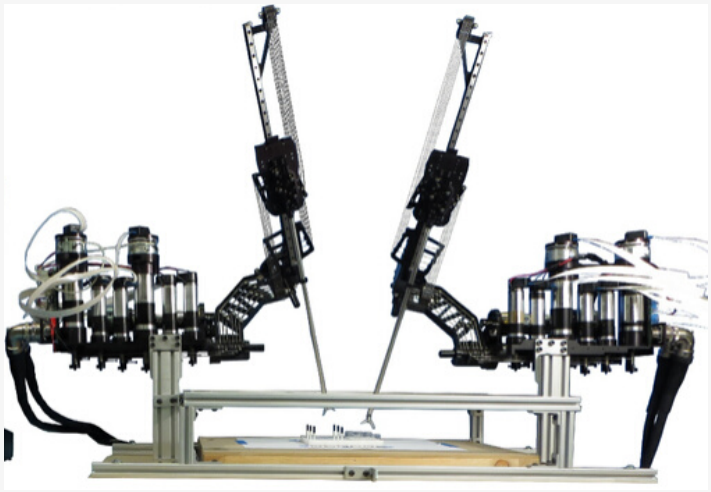
ROS is open-source software managed by Open Robotics, which supports the development, distribution, and adoption of open-source software for using in robotics research, education, and product development. ROS was developed in 2007 at the Stanford University's Artificial Intelligence Laboratory along with twenty other institutions and industries across the globe. It has been widely used not only in research but also for commercial applications. For instance, Robotnaut 2, robot developed by NASA runs completely run in ROS platform. Similarly, ROS also provides interfaces for common industrial robots produced by ABB, Fanuc, and Yaskawa as well as sensory devices along with software libraries which are growing day by day.

Robotnaut 2

Courtesy: *robonaut.jsc.nasa.gov*

However, ROS is not like a traditional operating system, but a framework and set of tools that provide a communications layer above the host operating system on a distributed computer systemwhere dozens of processes can be run in parallel across multiple systems or nodes. ROS-enabled robot integrates with Internet of Things, which build a network of physical objects and devices like sensors and actuators.

For prototyping and training of intelligent behavior of the robots in different environment, various ROS compatible robot simulators are available.

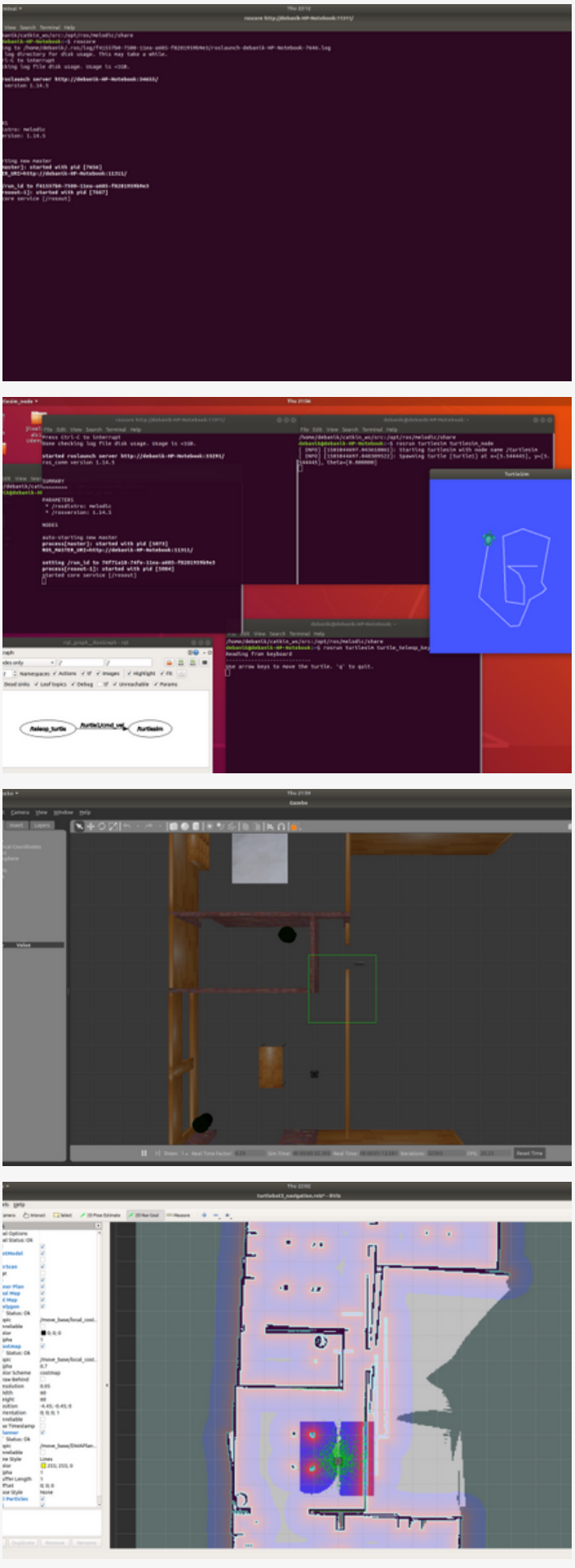


Raven II

Courtesy: *brl.ee.washington.edu/robotics*

One of the most commonly used simulators is Gazebo which has been used extensively in both academia and industry to accelerate the robotics development from the research stage to the real-world scenarios. Moreover, the ROS community provides technical supports, organizing training courses and workshops. ROS has also penetrated to medical robotics research community, developed the medical robots with ROS called Raven II in 2012 and the da Vinci Research Kit in 2014.

To develop a robot with ROS, an onboard computer is needed that allows remotely control and monitor a robot, connected Wi-Fi, by using a gamepad or keyboard and a feed from the camera mounted on the robot. ROS is available on various platforms like OS X, Arch Linux, Debian, Raspbian and Android. However, the officially supported version is on Ubuntu. The languages used for writing ROS code are C++ and Python, but C++ being preferred due to better performance. ROS provides its own repositories that need to add. The workspaces for ROS are managed via catkin. It runs on roscore terminal that host the communication with all the nodes or devices. ROS allows developers to choose the components with more than 3,000 packages available to add in the core system. An environment needs to create for simulating a robot application and the result is applied to the real system by creating a launchfile in the onboard computer; where the remote computer runs as ROS master. On the other hand, ROS 2 provides the advance features in edge computing and deep learning with Industry 4.0 environment for autonomous mobile robots (AMR) and collaborative robots (COBOT).



Working with ROS

(Courtesy: Debanik Roy, 3rd Year, Robotics Engineering, The Neotia University)

A significant market rise for robotics and automation has been projected into the sectors like healthcare, automotive, aerospace & defense, electronics, food and packaging, and logistics in recent years. With the adoption of advanced robot operating systems, these sectors can supply highly advanced product in near future.

Marketresearchfuture.com has reported a study of global forecast that estimated the ROS market to reach a value of US$276 million by 2023 growing at a 10.91% CAGR during the forecast period 2018 to 2023. They have also identified the key players in the market as Microsoft Corporation, ABB Ltd, KUKA AG, Fanuc Corporation, Yaskawa Electric Corporation, iRobot Technologies,

Humanoid MARIA- developed by
Robotics Engineering,
The Neotia University

Omron Corporation, Husarion Inc., Clearpath Robotics, Cyberbotics Ltd, and Rethink Robotics among others.

Currently, a large number of service robots, unmanned ground vehicles (UGVs), mobile and industrial manipulators are programmed with ROS. With a strong community, it seems certain that the next 10 years of ROS will be filled with exciting new developments, transforming from a utility-based middleware to the engine that drives the future development of robotics and allied software tools.

The impact of ROS on academic research is also evident from the steady increase of publications that benefited from the software platform. However, developments of robots for industry and warehouses have exploded over the past several years. After COVID-19 Pandemic, robots are becoming more public facing. A large number of public-facing robots with ROS will continue to introduce to assist human which will not replace the human workforce, but rather will supplement them and allow employees to be more efficient.

The author of this article receiving the award "Outstanding Initiative of the year in Robotics", (For Higher Education category under Center, State or Private University providing advance technology education) from All India Council for Robotics & Automation, 2020, New Delhi.

MYOELECTRIC-POWERED ROBOT-ARM

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Introduction

Amputation has always been a lifelong abnormality of the external human body [1]. Basic hand movement control capabilities, such as typing on a computer keyboard or holding a cup of coffee, are difficult for amputees. Individuals suffering from spinal cord injury and major accident victims also face some serious life consequences. The rehabilitation to these disabled still persists as a long-term vision.

This article summarizes the development of a prosthetic robot-arm that can be used by a differently-abled individual to perform wrist, grasping and functional movements using electromyographic signals in real-time. The prosthetic robot arm provides mobility functions to the differentially-abled community and also for the rehabilitation of amputated patients and individuals with loss of muscle control [2]. A standard data collection procedure has been designed using myoelectric signal data acquisition system, the proposed procedure has been implemented in such a way that stimulates an individual to perform the hand movements. The data acquisition procedure was also been configured to be adopted by normal, intact and trans-radial amputated individuals.

The recorded signals are processed to obtain discriminating characteristics through the use of appropriate techniques. The extracted features are also evaluated to determine optimum features using hybrid optimization algorithm to improve the rate of information transfer under real-time testing.

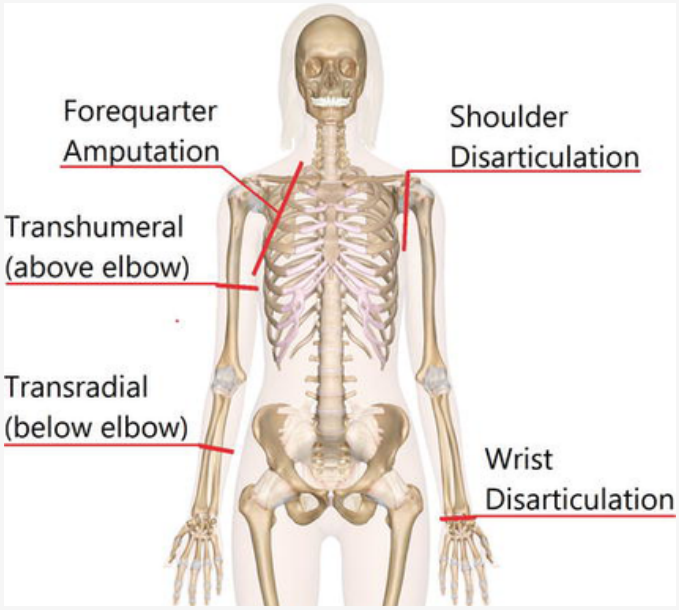
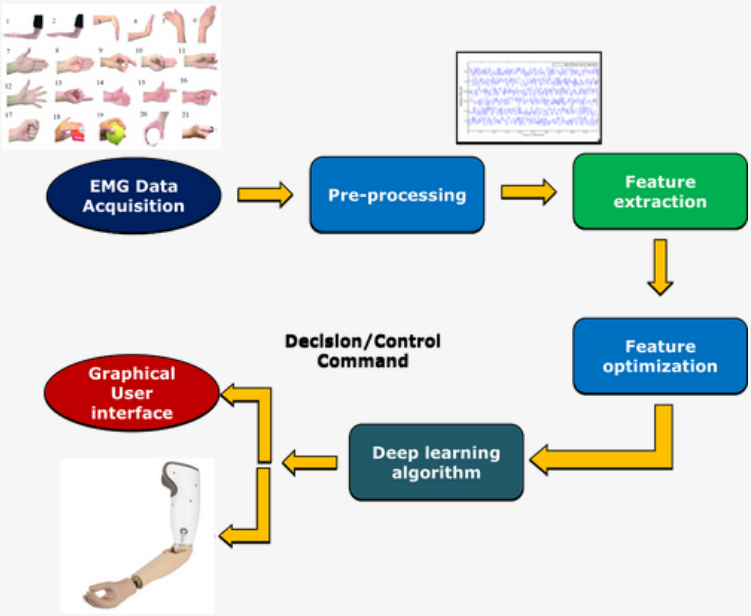


Illustration of level of amputation for upper limb
(***Source:*** *www.intechopen.com*)

The resulting features are then used to classify the mobility function and interpreted to the prothesis arm. The final outcome is a prosthetic robotic arm that will assist differently-abled individual in performing the tasks of wrist, grasp, and functional arm movement in everyday life.

Theoretical Framework

a. Development of data acquisition protocol
b. Data validation and pre-processing
c. Development of feature extraction, optimization algorithms
d. Development of feature classification using deep learning algorithms and fuzzy systems
e. Development of prototype model of prosthetic robot arm
f. Testing and validation of results



Block diagram of the myoelectric-powered robot-arm

Methodology

Acquisition of myoelectric signals

The surface EMG electrodes are placed between the motor unit and the tendinous insertion of the muscle, along the longitudinal midline of the muscle [4]. Protocols and methods are developed based on EMG signal acquisition to record the myoelectric signal for different hand movements which includes flexion and extension, hand postures, wrist movements and grasping movements. A database of EMG signal has to obtained by collecting samples from different individuals who are normal, intact and trans-radial amputated individuals.

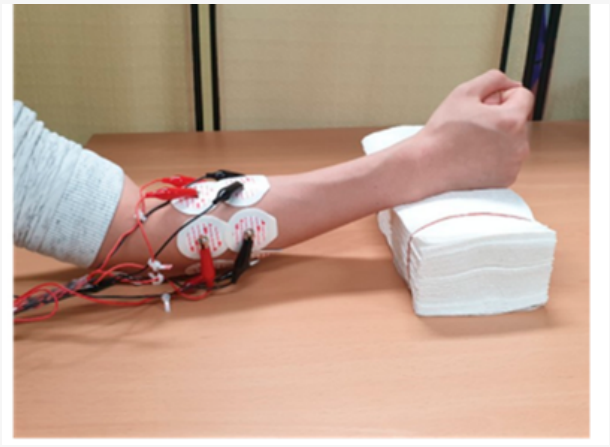


Illustration of electrode placement around the circumference of the forearm [3]

Selection of feature extraction methods and deep learning based classifier The obtained myoelectric signals are preprocessed to remove the unwanted signals and the features are extracted using digital signal processing techniques. The dervied futures are associated with the type of the hand movements and used for optimization. The deep learning classifier is developed and trained based on the feature matrix to classify the type of the movements.

Concluding remarks

In recent years, a variety of methods and approaches have been proposed by researchers for detecting the hand movements using EMG signals. However, the choice of features for classification that includes pre-processing algorithm, feature extraction technique and feature selection/optimization is still a challenging task, and there are limited information on the correlation between EMG signal measurement (electrode position) and different hand movement functionalities such as wrist and finger movements. So, understanding the psychology of anatomy may lead to improve the selection of feature extraction algorithm to derive the features. Thus, this article is confined to the investigational study on prosthetic robot arm using myoelectric signals and deep learning algorithms.

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AUTOMATED GUIDED VEHICLE (AGV)

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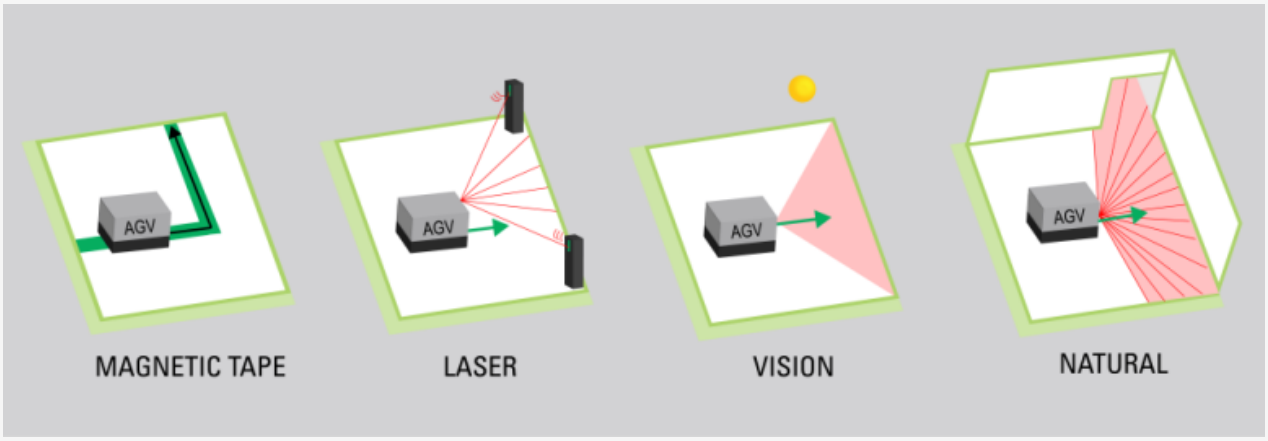
The Automated Guided Vehicles (AGVs) are autonomous electric vehicle that is primarily used to transfer load from one area to another in industries. These vehicles are trained to work in a predefined path to carry out routine works such as transferring load from one place to other so as to reduce the cost, human error and also increase the efficiency while maintaining the safety. There are so many methods by which AGV can be guided, namely, magnetic or wired, vision navigated, laser navigated etc., [1]. But the cheapest of all forms is the magnetic guided AGVs.



AGV Navigation Systems *(Source: epsnews.com)*

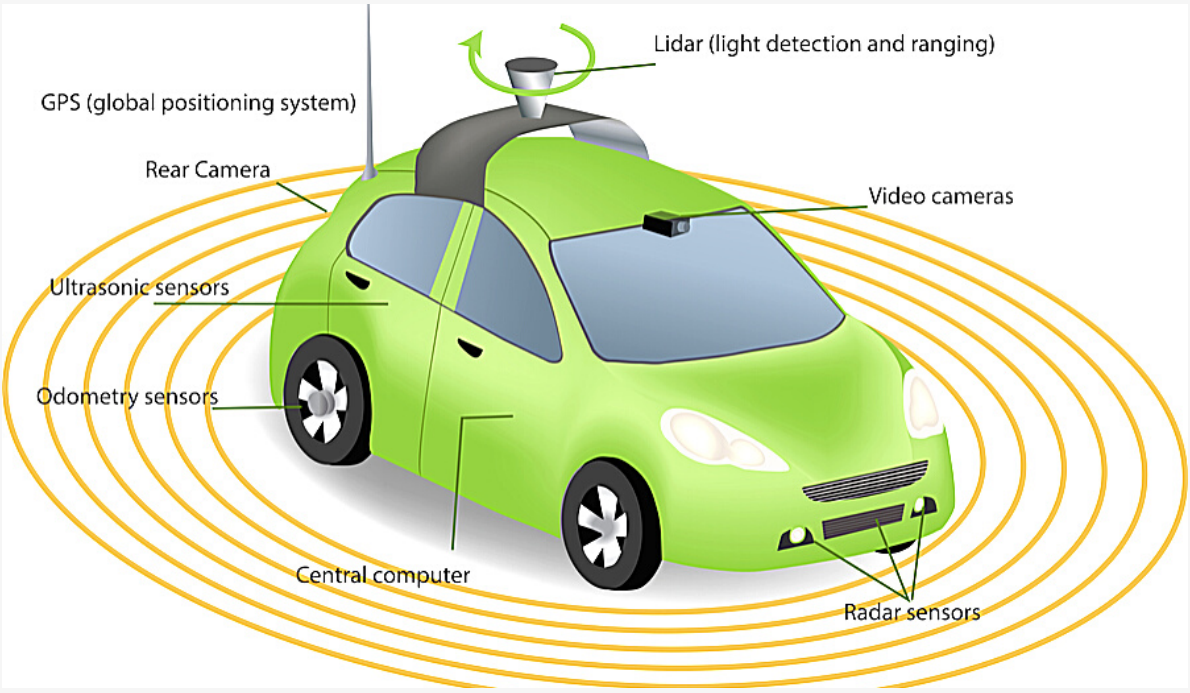
A simulated model of AGV in a shop floor

AUTOMATED GUIDED VEHICLE (AGV) (CONTINUED...)

AGVs are commonly driven by BLDC motors and powered by Lead-acid batteries. They are conventionally back wheel operated and also provided with 360° rotatable castor wheels. Despite the motor speed, to get maximum torque and to operate in a safe speed, the motor speed will be reduced to 100 RPM. The path is instructed to the AGV via magnetic tape. The magnetic tape is laid on the surface of the floor. It provides the path for the AGV to follow and also strips of the tape in different combinations of polarity, sequence and distance laid alongside the track tells the AGV to change lane, speed up, slow down, and stop [2].

Further, to avoid collisions, they are provided with three sensors one in front and each one on sides. These sensors are of either ultrasound or Infrared. Since they are supposed to work in harsh environments, Programmable Logic Controllers (PLC) are used as controllers.

There are AGVs having advanced sensing systems which includes but not limited to RADAR, LIDAR or computer vision [3]. Although AGVs are not having auto pickup facility, it is not far away to have end to end automated AGVs.



AVG with LIDAR sensing system

*(**Source:** innovationatwork.ieee.org)*

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DIGITAL MARKETING

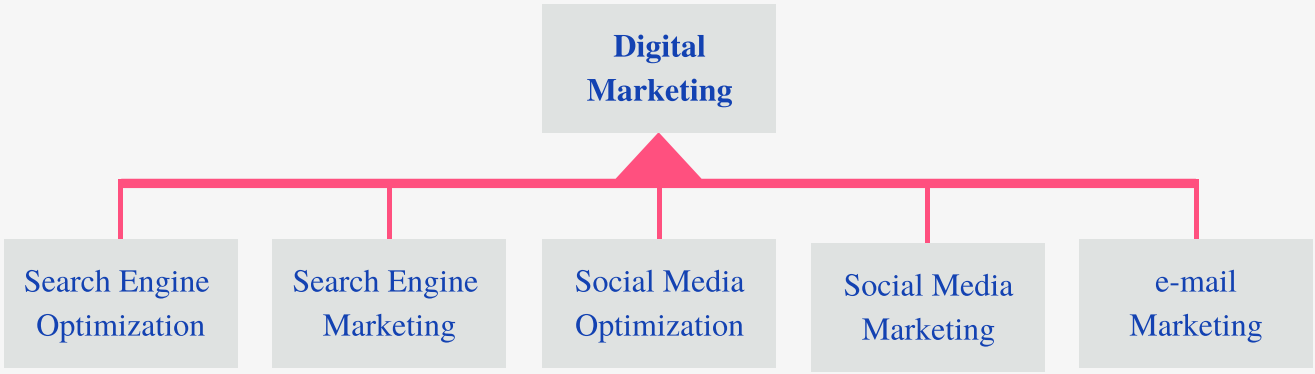
A POWERFUL PLATFORM FOR RAPID SUCCESS

A SHORT GUIDE TO STUDENTS' COMMUNITY

Mr. Shailendra Tripathi,
Founder-Konnectogrow,
Pune, Maharashtra.

Digital marketing is an online marketing platform that shelters all essential strategies to make the name a brand of the future. SEO (Search Engine Optimization) and SMO (Social media optimization) are two solid arms through which a business develops its production and visibility percentage.

As the people spending time in social media and moving towards e-commerce, it is necessary to footprint strongly in the digital world to maximize the visibility which will result high sales volume. Therefore, digital Marketing is the perfect answer for all types and grades business questions – What, Where, Who, When, Why and How. This is not only essential for companies but also to students to get better employment.



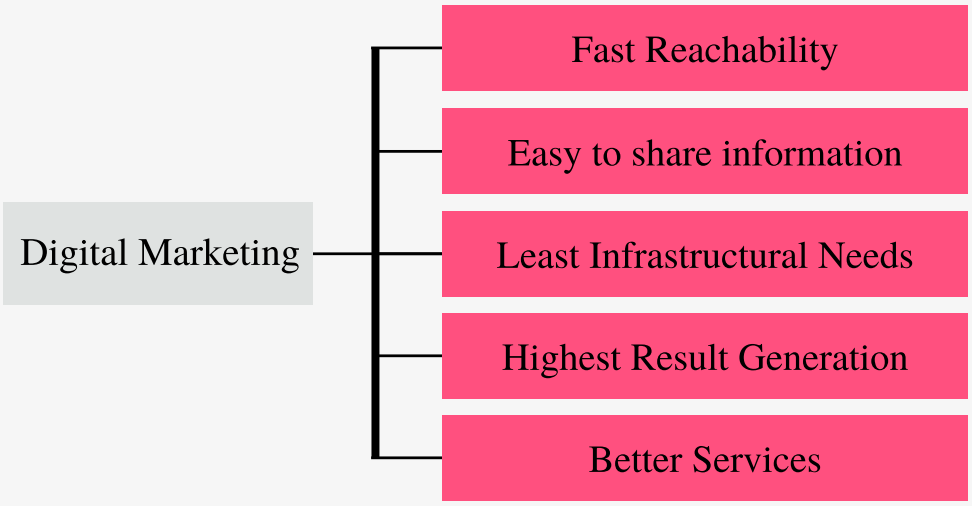
There are many digital marketing training options around, but how to find the best that suits you accurate. This article gives you helpful tips while choosing the training and also enjoy the benefits. One should keep in mind while looking at courses and if you are already aware of its benefits then enroll to one of the digital marketing courses available online. Lastly, you need to look at the structure that suits you the best. At that point also check the probability of working on live projects as they will give you an opportunity of practical use of digital marketing.

Effective Preparation of Digital Marketing

Once you decided to spend your valuable time to learn about digital marketing, you should select a certified institution that will provide a professional certificate. Digital Marketing is developing and presenting every day new channels and platforms. So always be updated such as,

- Day-to-day increase the reachability
- Be the first for customer satisfaction
- Crack to be the trend changer of the industry
- Bring new opportunities

Today maximum companies are focusing on SEO (Search Engine Organization) and SEM (Search Engine Marketing) as they include key parts of digital marketing as e-commerce and social media. SEO and SMO are the branches increasingly becoming popular in the job market globally. To gain more than theoretical knowledge, these platforms will provide countless options for anyone interested to acquire more about the digital world.



Advantages of Digital Marketing

Being Digital Marketing Professional

Choosing digital marketing can help students to become a future developer in digital marketing. One can promote themselves and highlight their strong point on various platforms such as maintaining your own website, run a social media account, Google Ads and many more. Most importantly digital marketing will help to think from a creative and business side of any project in hand. Currently, the job market is filled with ads of digital marketing openings as most companies are moving towards the digital platforms.

Today students are looking for a career that offers them flexible schedules and nomad lifestyle. The digital marketing is completely done online no matter whether you work in the office, from your house or from a tropical beach and help you to maintain social distancing. So taking training in digital marketing will be beneficial for the students in various ways personally and professionally too.

Conclusion

When an employee gives the desired results with very little supervision, they will be considered as an asset to the company. In a nutshell, digital marketing provides a wonderful scope to become an asset to the company whilst working from elsewhere. A qualified digital marketing professional will have red carpet welcome globally on employment. As a fresh graduate, pursuing a career in digital marketing will not only lucrative but also enjoyable.

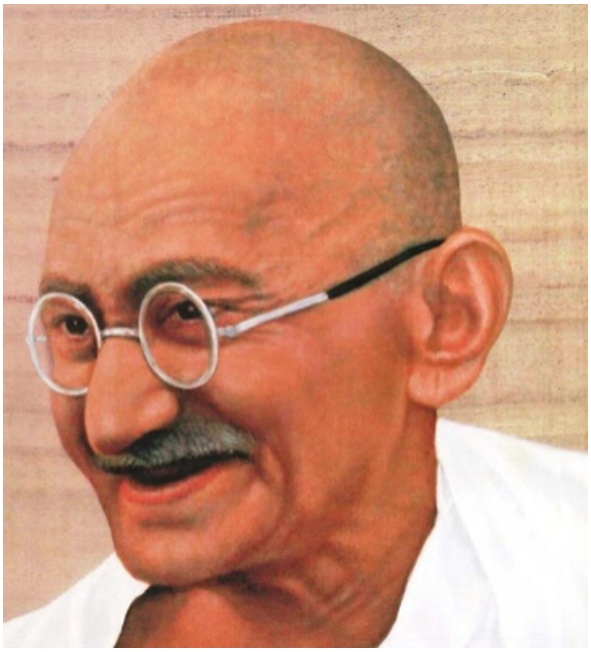
FACULTY OF THE ISSUE

Prof. R. Dhivya Praba

Prof. R. Dhivya Praba is working as an Assistant Professor and has 11 years of academic experience at Kumaraguru College of Technology. She completed her M.E degree in 2009 from Government College of Technology, Coimbatore. She is a recipient of Gold medal for her M.E. Degree and currently pursuing Ph.D. (Part-Time) under Anna University, Chennai. Her area of research includes Machine learning, Signal and Image Processing. She started her carrier as lecturer in the year 2006 at SSM College of Engineering. She holds various academic responsibilities like Class advisor, Lab in charge, DAB coordinator, Innovation and best practices coordinator, Anna university affiliation and autonomous In-charge, Time table coordinator etc., She has received management funded project for "Wireless Smart Apparels for Anti-fatigue and Rehabilitation" in the academic year 2016-17.

She has organized National conference, Faculty Development Programme, various Workshops and IEEE Junior Einstein Project competition for school students. She published many papers in Journals, International and National Conferences and book chapters. Her spouse Mr.B.Suresh Kumar, B.E., is a Senior PCB-CAM Engineer at Velan Info Services, Coimbatore. She is blessed with two children, Master D.S.Rudhvik and Baby B.S.Hemanya Sri. Her Father Mr.B.Ramasamy and Mother Mrs.R.Sarojini are servicing for the nation as Farmers.

I have always
felt that
the true text-book
for the pupil is
his teacher



STUDENT OF THE ISSUE

Mr.K.Viveka Vikram

Mr. K. Viveka Vikram is a vibrant and dynamic person who always uses his time utmost. He strongly believes that “Hardwork beats talent when talent doesn’t work”. He is a positive, optimistic, unequivocal and self motivating person who always thrives to achieve great dreams in life. With a strong academic background in school level, Viveka Vikram joined at Kumaraguru College of Technology which was a best place for him to evolve and find his passion and skills.

As an Electronics and Communication Engineer, he balanced academics, co-curricular and extracurricular activities effectively and received Mahatma Gandhi Scholarship Award for the academic years 2017-2018 and 2018-2019. He is an active member of Department Association, Kumaraguru Tamil Mandram, Kural and Agam Club. He is the President of HAM Club of Kumaraguru for the academic year 2018-2019 and 2019-2020. He is a part of Fantastic Forty which helps him to structure his technical and interpersonal skills. He was also a former member of Toastmaster International Club.

He along with his team members are one of the finalists in Student Design Challenge at International Conference on Advanced Computing and Communication held at IIT Bangalore and delivered their research paper on “Maternal e-health monitoring system using Lora Technology”. He presented a paper on “Intelligent Transportation System using Lora” in Karpagam College of Engineering. He took part in 5-day implant training in Uniq Technology in the domain of IOT and Embedded System. He attended 72 hours Hackathon-Innovation Boot Camp organized by Forge and came out with a proposal for Battery Swapping Technology in Service Delivery Vehicle. He won third prize for his Technical Paper entitled “Advanced Intelligent Transportation System in National Level seminar organized by Institution of Engineers, India (IEI). With his team members, he won 3rd Prize in Fox Hunt in LAMAKAAN Annual Radio Convention-2019 held at Hyderabad.

He participated in various events at national level such as Yogic Shiksha Residential camp, Ananta Aspen Emerging Leaders Fellowship representing Kumaraguru Institution and so on. He completed Psychology course on Transactional Analysis Proficiency, certificate course on Finance for Engineers in KCT Business School and exploratory study on Virtual Reality through exploration circle in Re. He was awarded as a best speaker in debate in Kosmorena. As a member of IEEE, he organised IEEE SS 12 Einstein Project track. He took part in Ignite boot-camp for the past two years. He also rendered Social Service by being a part of U&I, a volunteer organisation for teaching underprivileged kids. Currently, he leads his career as an Associate Engineer in Robert Bosch Engineering and Business Solution.

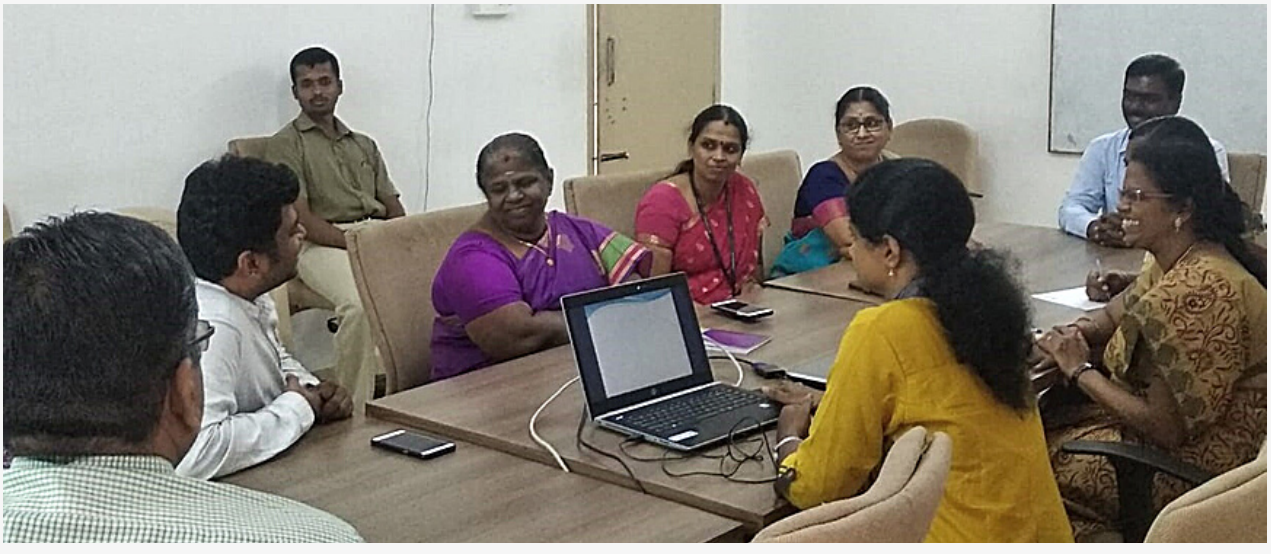
DEPARTMENT EVENTS

International Faculty Interaction

An international faculty interaction session was organized by the department on 02.01.2020 with Dr. Prasantha Ghosh, Professor, Electrical Engineering and Computer Science, Syracuse University, NewYork. International research opportunities for the faculty members and students on various trending areas such as Electric Vehicles, high speed electronic devices, Microgrid design and analysis, FinFET design and analysis and development of Thin Film Sensors were discussed in the event. The event was co-ordinated by Dr.Ramalatha Marimuthu, Professor, Ms.A.Kalaiselvi and Mr.R.Navaneetha Krishnan, Assistant Professors of the department.

Training the Trainers Program

A two-day training on Training the Trainers Program was organised from 03.01.2020 to 04.01.2020 in collaboration with Clean Toilet Organisation with a vision of inculcating the culture of cleanliness in the society. The initial discussion with the organization was held on 24.12.2019. The discussion and training sessions were engaged by Mr.D.Jayakandhan, Governor of Rotary club of Coimbatore west and the event was co-ordinated by Dr.Ramalatha Marimuthu, Dr.K.Kavitha, Professors, Dr.M.Alagumeenaakshi, Associate Professor and Ms.R.Dhivya Praba, Assistant Professor of the department.

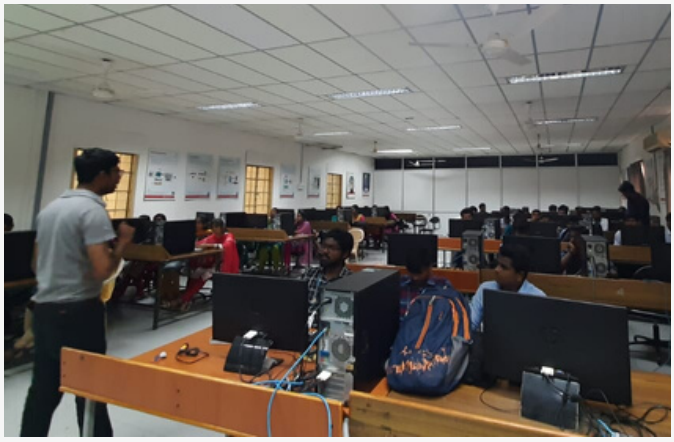


DEPARTMENT EVENTS

Department Advisory Board Meeting

The Department Advisory Board Meeting (DAB) was conducted on 07.02.2020 to review the Department Progress as per the Strategic plan (2019-2020), the teaching learning process and plan for improvement, CO-PO attainment and PAC deliberation. Mr.A. Ramkumar, Assistant Professor, Mechatronics Engineering, Dr.N.Vinoth Kumar, Assistant Professor, EEE and Dr.Vinohar Stephen Rapheal, Associate Professor, Biotechnology participated in the meeting as expert members and DoA member from other departments. The alumni members Mr.K.Tamilvanan and Mr.Arjun Raj presented their views during the meeting. Also, Dr.M.Jayakumar, Chairperson, ECE Department from Amritha Viswa Vidhya Peedam, Coimbatore and Mr.A.Venkateshbabu, Parent representative had participated in the event and presented their suggestions. The meeting was co-ordinated by Dr.M.Shanthi, Associate Professor and Ms.R.Dhivya Praba, Assistant Professor of the department.

One credit course on Industrial IoT



One credit course on Industrial IoT for final year students was organized under two phases from 29.02.2020 to 01.03.2020 and from 08.03.2020 to 09.03.2020 in which 48 and 25 students participated and benefited respectively. The course was handled by Mr.Dinesh and Mr.Nagarajan, SAI Incubation Centre, Coimbatore and co-ordinated by Ms.S.Nagarathinam, Assistant Professor of the department.

Guest Lecture

A guest lecture on Introduction to Computer Vision with Deep Learning was conducted on 21.02.2020 for 120 students. The session was handled by Dr.Deepak Mishra, Associate Professor and Head, Department of Avionics, IIST/Trivandrum.

DEPARTMENT EVENTS

Workshop on PCB / Antenna Design and Fabrication

A two-day workshop on PCB / Antenna Design and Fabrication from 19.02.2020 to 20.02.2020 was conducted. The sessions are handled by Mr.Kamalesh, Application Engineer, Entuple Technologies Pvt. Ltd, Bangalore. Around 90 attendees were trained on PCB design using KiCad software, Fabrication process using Antenna/PCB prototyping Machine and demo on Plated Through Hole (PTH) tank setup. The event was co-ordinated by Dr.K.Kavitha, Professor and Ms.K.Thilagavathi, Assistant Professor of the department.

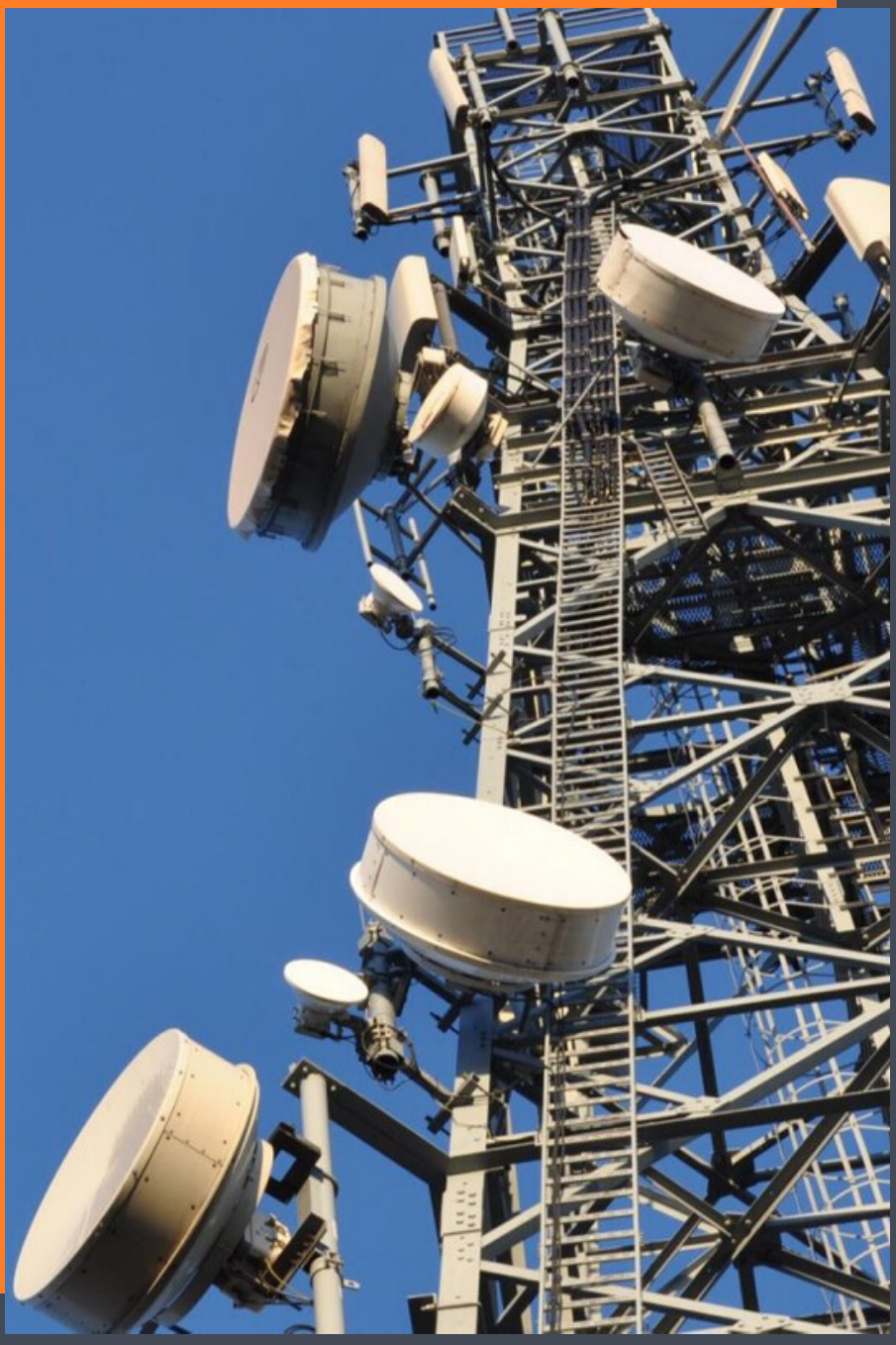
New Resources Created

A new laboratory facility "PCB & Antenna Prototyping Machine / PTH Tank" was established under AICTE - MODROBS scheme. The facility was inaugurated by Dr. Uma Raghunathan, Director-Students Development, AICTE (HQ), New Delhi on 20.02.2020. The event was co-ordinated by Dr.K.Kavitha, Professor and Ms.K.Thilagavathi, Assistant Professor of the department.

FACULTY PARTICIPATION & PUBLICATIONS

- Dr.B.Gopinath, Associate Professor, Ms.S.Nagarathinam, Ms.R.Dhivyapraba, Ms.K.Karthika, Mr.S.Arunkumar, Ms.Jasparvinitha Sundari, Ms.S.Tamilelakkiya Assistant Professors of the department attended one-week faculty training programme from 03.01.2020 to 08.01.2020 conducted by the FORGE Accelerator.
- Mr.D.Allin Joe, Assistant Professor participated in Research Support Conclave 2020 from 08.01.2020 to 10.01.2020 organized by Coimbatore Institute of Technology, Coimbatore.
- Dr.S.Umamaheswari, Associate Professor participated and presented a research paper in the International Conference on Computation, Automation and Knowledge Management at Amity University, Dubai from 09.01.2020 to 11.01.2020.
- Dr.M.Bharathi, Professor participated in IWN Leadership Conclave with the theme, "Say Yes Getting Women ready for India@75" from 27.01.2020 to 28.01.2020 organized by CII-IWN at Kochi, Kerala.
- Mr.R.Karthik Kumar, Assistant Professor attended a two-week Faculty Development Programme on Enterprise and Entrepreneur Development at Kumaraguru College of Technology sponsored by EDII, Ahmedabad under the under the aegis of NSTEDB, Department of Science & Technology from 10.02.2020 to 22.02.2020.
- Dr.B.Gopinath, Associate Professor participated and presented a poster in International Conference on Purification and Recycling of Electronic Materials organized by C-MET, Hyderabad from 08.03.2020 to 10.03.2020.
- Dr.M.Alagumeenaakshi, Associate Professor participated in AICTE Training And Learning (ATAL) Programme on Robotics organized by Indian Institute of Technology (BHU), Varanasi from 10.03.2020 to 15.03.2020.
- Dr.S.Uma Maheswari, Dr.S.N.Shivappriya, Associate Professors, Ms.Krithika, Ms.K.Anusha and Ms.K.Karthika, Assistant Professors attended an event on Modern Tools usage on research paper writing conducted by Dr.Vijayakumar, School of Computer and Electrical Engineering, Indian Institute of Information Technology, Design and Manufacturing, Chennai on 14.03.2020.
- A guest lecture was delivered by Dr.Rani Thottungal, Dr.Ramalatha Marimuthu, Dr.M.Alagumeenakshi and Dr.S.N. Shivappriya on Research Paper Writing on 02.03.2020.
- Dr.M.Shanthi, Associate Professor attended a Webinar on Design Thinking: Turn research into innovation conducted by Elsevier Research Academy on 26.03.2020.
- Ms.K.Jasmine, Dr.K.Kavitha and Ms.R.Dhivya Praba published a research article entitled "Performance Analysis of Diversity Techniques for Wireless Communication" in International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering, Vol. 9, Issue 5, 2020.
- Ms.R.Dhivya Praba published a research article entitled "Fake Product Review Monitoring and Removal for Genuine Online Product Review Using IP Address Tracking" in International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering, Vol. 9, Issue 6, 2020.

Programmes Offered



- B.E. Electronics and Communication Engineering
- M.E. Communication Systems

Testimonials
M.E. Communication Systems

As a postgraduate student, I feel that KCT has enhanced my skills in the field of electronics and communications. With the guidance of amazing faculty members, I was able to develop my knowledge in both technical and non-technical aspects by involving me in various events conducted by the department. The placement and training cell has extended their service for placing PG students and I got placed in Infosys.

SWETHA.O
[2018-2020 Batch, M.E. Communication Systems]

I completed my Post Graduation in M.E. Communication Systems during 2016-2018 at KCT. Now, I am working as a Research Scientist in SAMEER, Centre for Electromagnetics, MeiTY, Chennai. I always feel happy about my life at KCT. from our beloved professors, I learned a lot of essential technical skills to stepping into RF and Telecommunication fields. From my stay at KCT, I learnt and understood that there is no substitute for hard work.

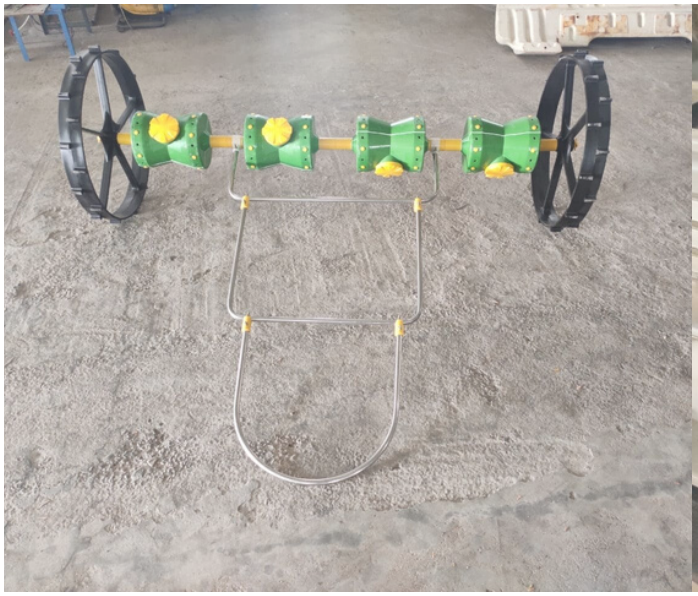
Mr. A. Chandra mouli
[2016-2018 Batch M.E. Communication Systems]
SAMEER, Chennai

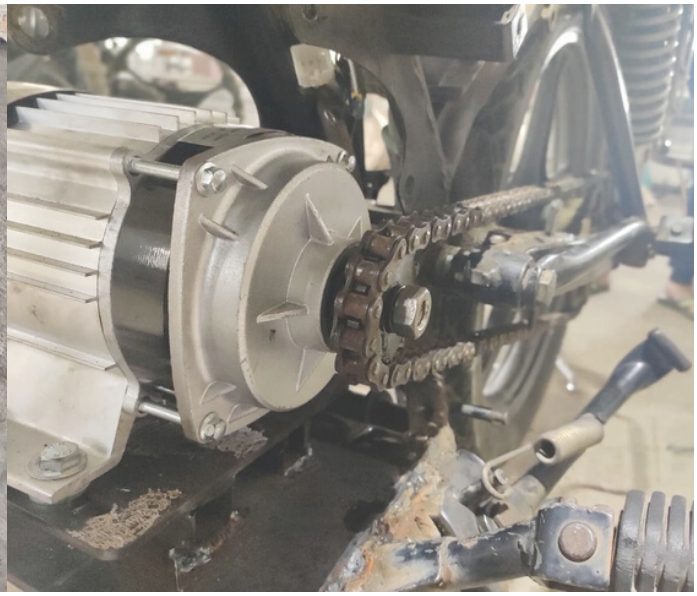
My experience in KCT has given me the chance to grind my skills in RF and wireless communication. The faculties were very helpful and ready to support us at any time. The well-equipped laboratories and the staff helped me to sharpen my crafts as a result of my time in college.

NANDANA B.T.
[2012-2014 Batch, M.E. Communication Systems]
RF & Antenna Design Engineer
Verdant Telemetry and Antenna Systems, Kochi, Kerala.

KC.AIR

A center becoming a global hub in Robotics and Autonomous Systems



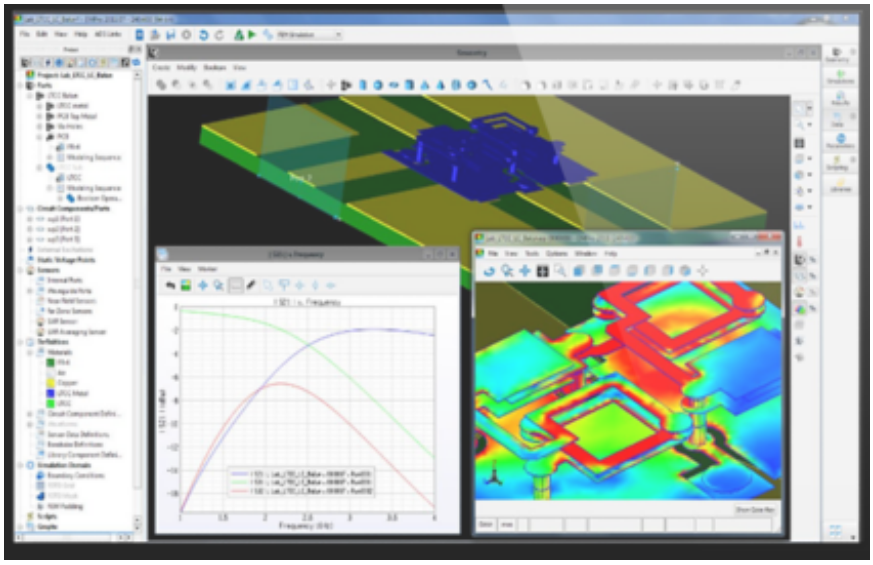


Kumaraguru Center for AI & Robotics - KC.AIR was established in the year 2019 as I-CAR with a vision of becoming a global hub to conduct research and innovation in Robotics and Autonomous systems. The center has multi-disciplinary expertise in mechanical, electrical and electronics and computing domains includes reverse engineering, CNC Manufacturing, UWB RTLS, LORA, ROS, AR, VR and mixed Reality.

Currently, the center is operating with 4 ongoing projects of worth Rs. 1.5 crores funding from various govt agencies and industries. With a strong collaborations with Ministries, scientific societies, Academia, Industry and start-ups such as Meity, CDAcs, and IITs it further intends to strengthen with more collaborators from academia and industries. The KC.AIR is headed by Dr.S.A.Pasupathy, Professor & Head of ECE Department.

Keysight-KCT

A center offering excellent training and education for students in Advanced Communication and RF System Design



Keysight Technologies, one of the pioneering companies in the world having a strong expertise in wireless communication technologies, had collaborated with ECE department and established the Center of Excellence in Wireless Technology in the year 2019. This is intended to benefit students who dream to pursue their research in the field of advanced wireless communication and RF system design. This would serve as a platform for students and aspirants to pursue their interest in the field of RF design.

More than Rs. 86 Lakhs has been invested for various Keysight equipment including Vector Network Analyzer (3 GHz), Multi Purpose Lab Station (MPLS), Vector Signal Generator and 9 KHz to 7.5 GHz Signal Analyzer, ADS RF Design and Simulation software + EMPro full 3D EM Design and Simulation Software, Fieldfox handheld Microwave Analyzer 14 GHz with VNA. Various consultancy works for PCB design, PCB Fabrication, Antenna testing and Fabrication are being carried out. Total amount sponsored from Keysight, through special education offers, is about Rs. 1.34 crores. Dr.K.Kavitha, Professor, Ms.K.Thilagavathi and Mr.R.Darwin, Assistant Professors are the Faculty Coordinators for this CoE.

Center of Excellence on Signal Processing and Embedded Systems

Texas Instruments-KCT

A center
offering excellent training and education
for students in
Signal Processing and Embedded Systems

Department of ECE has established "Center of Excellence in Embedded Systems and Signal Processing" in association with M/s. Texas Instruments (through M/S. STEPS Knowledge Services Ltd., Coimbatore) to engage interdisciplinary training and research along with other departments. The center offers various training courses and workshops on Internet of Things (IoT), Mixed Signal Controllers, Energy Efficient Microcontrollers and its Applications and so on. The budget spent for establishing the center is approximately Rs. 60 Lakhs.

The center is well equipped with significant major equipment such as ASLK PRO Kit, MSP 430 EXP G2 Launch Pad with accessories, C2000 Piccolo LAUNCHXL-F28027, CC3200 Simple Link Wi-Fi Launch Pad, TMS320C6748 DSP Development Kit (LCDK) and so on. The faculty in-charges of the center are Dr.M.Bharathi and Dr.A.Amsaveni, Professors of the department.

LoRaWAN Academy

India's FIRST Institutional academy for students and developers in IoT domain

Department of ECE has established Center of Excellence - LoRaWAN Academy in IoT domain in association with Semtech Corporation, a supplier of high performance analogue and mixed signal semiconductors and advanced algorithms. Kumaraguru College of Technology is the First pioneering institution in India to have the LoRaWAN Academy. LoRa Technology is a leading technology and recognised as the de facto platform for developing IoT applications. The budget spent for establishing the center is approximately $10000.

Semtech's LoRa devices and wireless radio frequency technology is a widely adopted long-range, low-power solution for IoT that gives telecom companies, IoT application makers and system integrators the feature set necessary to deploy low-cost, interoperable IoT networks, gateways, sensors, module products, and IoT services worldwide.

The LoRaWAN Academy provides comprehensive educational modules for students, engineers, developers and enterprises to develop Internet of Things (IoT) applications using LoRa-based technologies. The LoRaWAN Academy enables the young student developers to get their LoRa-based solutions to market faster as well as simplify development. The faculty in-charge of the center is Mr.S.Karthik, Assistant Professor of the department.

KUMARAGURU
college of technology
character is life

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Department Vision

To be a centre of repute for learning and research with internationally accredited curriculum, state-of-the-art infrastructure and laboratories to enable the students to succeed in globally competitive environments in academics and industry.

Department Mission

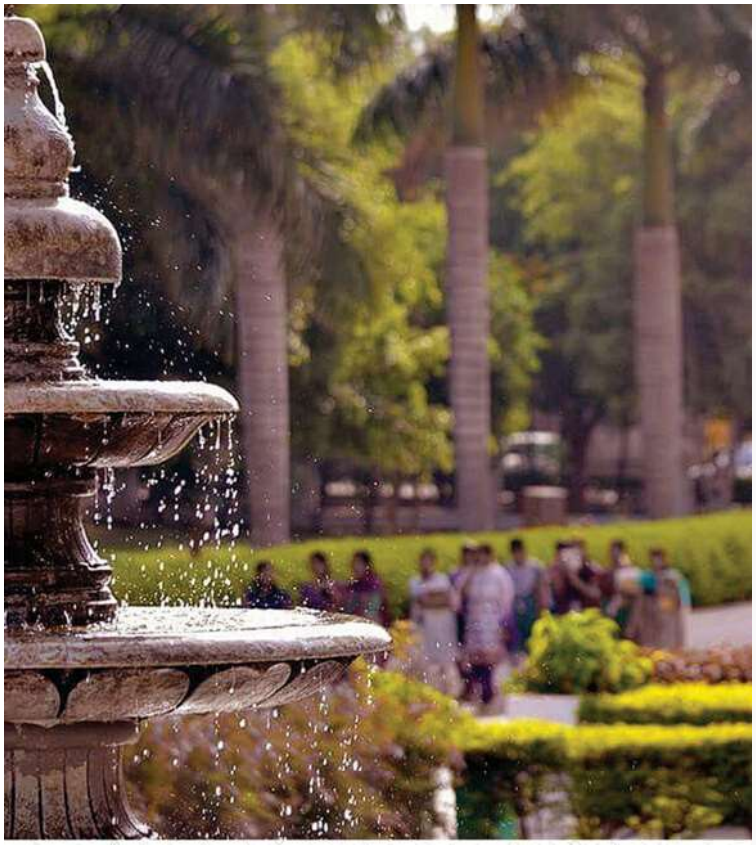
- Motivate students to develop professional ethics, self-confidence and leadership quality.
- Facilitate the students to acquire knowledge and skills innovatively to meet evolving global challenges and societal needs.
- Achieve excellence in academics, core engineering and research.

குமரகுரு
தொழில்நுட்பக் கல்லூரி

அய்யா

வணங்குகிறோம் வழிநடப்போம்

உங்கள் வாழ்க்கை - எங்கள் பாதை



Editorial Board

Dr.S.A.Pasupathy

Dr.B.Gopinath

Mr.S.Boopathy

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