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DEPARTMENT OF
ELECTRONICS AND
COMMUNICATION
ENGINEERING

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VISION OF THE DEPARTMENT

To excel in offering value based quality education in the field of Electronics and Communication Engineering, keeping in pace with the latest developments in technology through exemplary research, to raise the intellectual competence to match global standards and to make significant contributions to the society.

MISSION OF THE DEPARTMENT

- To provide the best pedagogical atmosphere of highest quality through modern infrastructure, latest knowledge and cutting edge skills.
- To fulfill the research interests of faculty and students by promoting and sustaining in house research facilities so as to obtain the reputed publications and patents.
- To educate our students, the ethical and moral values, integrity, leadership and other quality aspects to cater to the growing need for values in the society.

Program Educational Objectives (PEOs)

PEO1: Create value to organizations as an EMPLOYEE at various levels, by improving the systems and processes using appropriate methods and tools learnt from the programme.

PEO2: Run an organization successfully with good social responsibility as an ENTREPRENEUR, making use of the knowledge and skills acquired from the programme.

PEO3: Contribute to the future by fostering research in the chosen area as an ERUDITE SCHOLAR, based on the motivation derived from the programme.

Program Specific Outcomes (PSOs)

PSO-1: An ability to apply the concepts of Electronics, Communications, Signal processing, VLSI, Control systems etc., in the design and implementation of application oriented engineering systems.

PSO-2: An ability to solve complex Electronics and communication Engineering problems, using latest hardware and software tools, along with analytical and managerial skills to arrive appropriate solutions, either independently or in team.

FACULTY ARTICLE

CONTRIBUTION OF ELECTRONIC DEVICES, EMBEDDED SYSTEMS AND COMMUNICATION TECHNOLOGIES TO THE SUCCESS PATH OF AUTONOMOUS VEHICLES DESIGN

Mr. S.P.SIVAGNANA SUBRAMANIAN, Assistant Professor - Department of ECE, Sri Venkateswara College of Engineering, Sriperumbudur.

The role of embedded systems has been played in the evolution of the automobile industry. Most automotive features that use Electronic Control Units (ECUs) are supported by embedded systems comprising both hardware and associated software. Many ECUs in a high-end car can be interacted via hundreds of signals. These ECUs make use of a variety of microprocessors, microcontrollers, and Field Programmable Gate Array (FPGA) capabilities.

Although not all autonomous cars are completely self-driving, the term "self-driving car" is frequently used to refer to autonomous vehicles. The degree of autonomous driving is contingent upon the extent and level of automatic capability as shown in Figure 1.

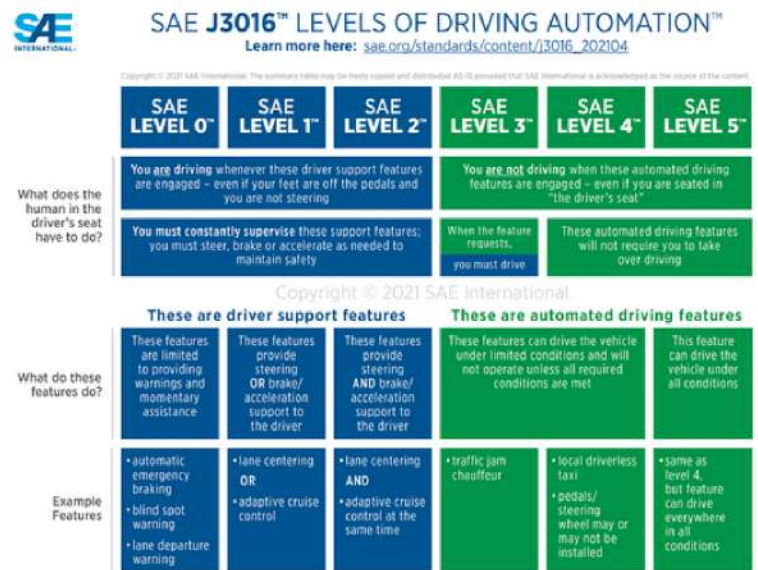


Figure 1: Levels of autonomous cars (Courtesy: SAE International)

Innovation in the automotive sector is being propelled by embedded automotive systems. They are making it possible for automakers to design safer, more effective, and pleasurable to drive cars. Here are a few instances of how innovation is being fueled by automotive embedded systems:

Autonomous Driving: Automotive embedded systems are essential to bringing about autonomous driving, which is the way of the future for the sector. To enable autonomous driving, a variety of sensors and cameras are used, which are monitored and controlled by embedded systems.

Electric Vehicles: The electric vehicle industry is experiencing innovation due in part to automotive embedded systems. A number of components of an electric car, such as the charging and battery management systems, are controlled and observed by embedded systems.

Connected Cars: Another area where automotive embedded systems are driving innovation is in the area of connected cars. Embedded systems are used to enable communication between the vehicle and the outside world, including other vehicles, infrastructure, and the internet.

For precise perception and safe navigation of their surroundings, self-driving cars rely on controllers, sensor systems, computer vision, artificial intelligence and machine learning algorithms.

Sensors - For sensing the surroundings:

Many sensors that perform redundant and overlapping tasks are commonly seen in self-driving cars. This allows them to take use of the advantages of many sensor types and have a backup sensor system in case one fails.

Developers of autonomous vehicles use cutting-edge data-processing methods, like sensor fusion, to process input from several sensors concurrently and in real-time. By enhancing how self-driving cars perceive and react to environmental cues, sensor fusion might increase vehicle safety.

LiDAR - For detecting objects with their distances:

Self-driving cars employ LiDAR (Light Detection And Ranging) sometimes referred to as 3D laser scanning, as a technology to use lasers to scan their surroundings. Thousands of infrared laser beams are pulsed into the environment by a standard LiDAR sensor, which then watches for the beams to reflect off nearby features.

. Point clouds, sets of points that depict three-dimensional forms in space are produced by several pulses of light.

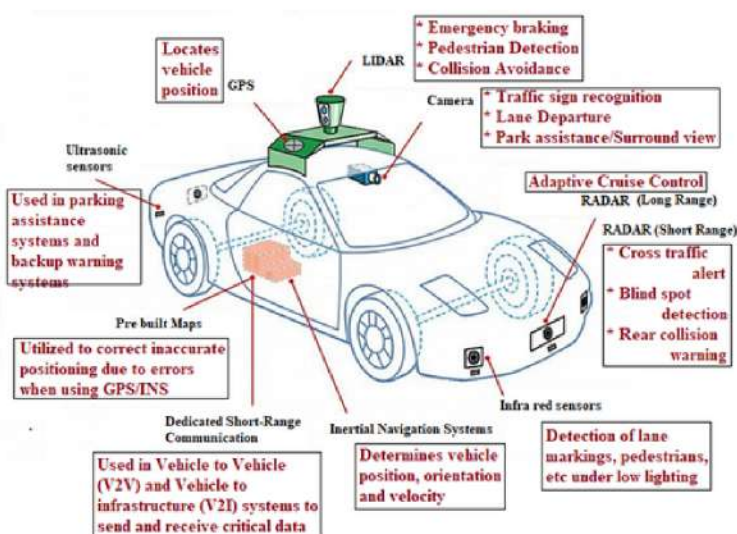


Figure 2: Sensors and systems in autonomous cars

LiDAR systems measure the time it takes for a laser to be fired off and for its photodetectors to detect the same light beam reflected off of a physical surface. LiDAR measures an object's distance from it using the speed of light. An object's distance is determined by how long it takes a lidar photodetector to receive a return light signal.

Autonomous cars are able to detect small objects with a high degree of accuracy using LiDAR systems. But, at night or when the weather is bad, LiDAR isn't always reliable.

RADAR - For deriving information about environmental objects:

RADAR (Radio Detection And Ranging) is most applicable to autonomous driving. Radar transmitters enable autonomous vehicles to emit radio waves in predetermined directions. An automobile's radar receiver receives reflected waves that help it determine the angles, ranges, and velocities of surrounding objects.

RADAR usually performs well in most weather conditions and over extended distances. It may, however, misidentify objects and isn't very helpful for identifying objects.

SONAR - For object recognition and communication:

Autonomous vehicles use SONAR (Sound Navigation and Ranging) to navigate and detect objects. It may be either active or passive. Systems that use passive SONAR merely listen for sounds produced by surrounding objects. Active SONAR systems read the echoes that physical surfaces return after emitting sound pulses. SONAR is useful for self-driving cars to identify large, solid objects (like metal or ceramics) at close range. Sonar sensors can function without light. SONAR sensors, however, are limited by the speed of sound, which is slower than the speed of light, and they can occasionally identify objects that are not there.

Cameras - For computer vision based data interpretation:

High-resolution digital camera images are used by autonomous vehicles to see their surroundings. In order to "see" and interpret environmental details (such as signs, traffic lights, and animals) in a manner that is similar to human vision, self-driving cars can employ camera images which is said to be computer vision. Various forms of input data can be utilized by self-driving cars for computer vision like Multi-dimensional information, portions of videos/photos taken with a camera at various viewing angles. Self-driving cars are capable of object recognition, motion control, and 3D scene modeling using image data. Just like any other sensor system, cameras have advantages and disadvantages. Although cameras have benefits related to high-resolution imagery, they are not always effective in all weather conditions. Moreover, cameras only record visual data that is visible.

Inertial Navigation Systems - For Sensing Movements:

The physical movements of a car are detected by inertial navigation systems, which use Inertial Measurement Units (IMUs) such as accelerometers and gyroscopes. These navigational aids assist autonomous vehicles in stabilizing and in deciding when to apply any safety precautions like deploying an airbag, and preventing the car from rolling over.

Global Positioning System (GPS) - For tracking positions:

The Global Positioning System (GPS) is a radio navigation system, comprising 24 satellites. Users can get time and geolocation data if they have a GPS receiver. GPS can be used by self-driving cars to geolocate, with numerical coordinates (such as latitude and longitude) indicating their actual locations in space. Additionally, they can navigate by fusing other digital map data such as Google Maps with real-time GPS coordinates. Self-driving cars can use novel data-processing techniques, such as particle filtering, to improve location accuracy in order to make up for inaccurate GPS data.

Artificial intelligence - For autonomous movement:

Self-driving cars use artificial intelligence to function similarly to humans in order to get from one point to another point. Thus, autonomous cars require the same fundamental navigational skills as humans:

Drawing and Reading Maps - In order to generate and interpret maps of their surroundings, self-driving cars integrate data from their sensor systems with other sources, such as digital maps.

Path Planning -Autonomous vehicles with artificial intelligence make use of their sensor systems to map out routes in their surroundings.

Avoiding Obstacles - In order to navigate safely, self-driving cars use their sensor systems in real time. In order to avoid obstructions like cyclists, pedestrians, buildings, and other cars, drivers must precisely sense, comprehend, and respond to environmental cues while operating a motor vehicle.

Conclusion:

The automotive industry is undergoing a revolution thanks to embedded automotive systems. They are making it possible for automakers to design safer, more effective, and pleasurable to drive cars. The automotive industry uses automotive embedded systems for a wide range of purposes, from performance and safety to comfort and environmental impact. The future of connected cars, autonomous driving, and electric vehicles means that automotive embedded systems will play an ever-more-important role in fostering innovation.

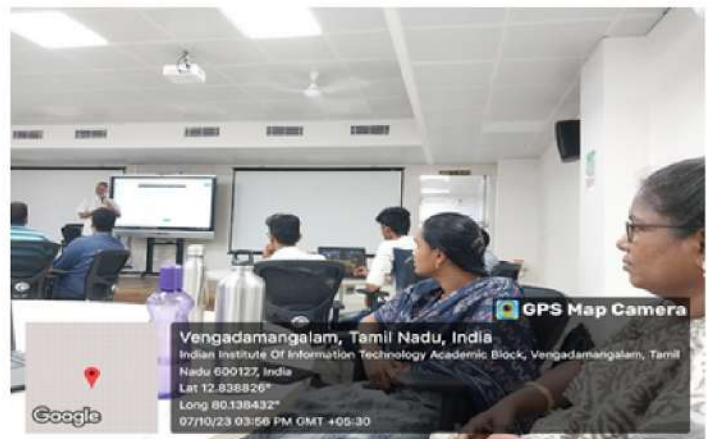
ACHIEVEMENTS

FACULTY PARTICIPATION

(Seminar/FDP/STTP/Workshop/Online Course/Conference):

- Mrs.R.Kousalya, Mrs.B.Sarala, Mrs.S.Kalyani, Mr.M.K.Varadarajan, Mrs.S.M.Mehzabeen, Mr.P.Arul, Mrs.S. Mary Cynthia, Dr. M Kavitha, Mr.L.K.Balaji Vignesh, Mr.D.Silambarasan attended three days Faculty Development Program on “Deep Learning Techniques for Image Analysis-Hands on Session” organized by Department of Electronics and Communication Engineering, Sri Venkateswara College of Engineering, Sriperumbudur from 03.10.2023 to 05.10.2023
- Mrs.S.M.Mehzabeen attended a technical seminar on “Journeying beyond Chip War: Unleashing the Art of Chip Design”) organized by Maven Silicon on 07th October 2023.

- Dr.S.R.Malathi, Dr.A.Ramya and Students from Third year and Second year (Mr.S.Bhuvan Shankar, Mr.A.Charan Kumar, Mr.A.Aakash, Mr.S.Magesh) have attended two days workshop on “Digital Design Fundamentals using System Verilog”, organized by Malavia Mission Teacher Training Centre, Indian Institute of Information Technology, Design and Manufacturing, Kancheepuram, Chennai from 07.10.2023 to 08.10.2023





- Mrs.C.Gomatheeswari Preethika attended five days National level Online Workshop on “Smart Antennas –The Design Perspective Using CST Studio Suite Software” organized by Department of Electronics and Communication Engineering, S.A.Engineering College (Autonomous), Chennai from 09.10.2023 to 13.10.2023.
- Dr.D.Menaka, Mrs.S.Kalyani, Mrs.S.M.Mehzabeen attended PALS Industry Assisted lecture series AI for IoT (FM for AIOps), during 12.10.2023, 19.10.2023 and 26.10.2023.
- Dr.D.Menaka, Mrs.S.Kalyani, Mrs.S.M.Mehzabeen attended CSIR Sponsored Three Days National Workshop on “Artificial Intelligence for Societal Applications-Space Exploration, Agriculture and Health Care” organized by KCG College of Engineering, Chennai from 18.10.2023 to 20.10.2023.

- Dr.T.J.Jeyaprabha, Mrs.R.Kousalya, Mrs.B.Sarala attended Two Days Workshop on “Blockchain Technology and Data Analytics” organized by the Department of Computer Science and Engineering, Sri Venkateswara College of Engineering, Sriperumbudur from 30.10.2023 to 31.10.2023.
- Mr.P.Arul, Dr.R.Priyadharshini, Mr.D.Silambarasan attended Two Days Workshop on “NI LabVIEW Fundamentals for Real Time Signal and Video Processing Using Embedded Technology” at College of Engineering, Anna University, Chennai from 30.10.2023 & 31.10.2023.
- Dr.M.Kavitha participated in the Seventh International Patent Drafting Competition 2023 organized by IIPRD, along with Khurana & Khurana, Advocates and IP Attorneys (K&K).



- Mrs.R.Kousalya, Mrs.B.Sarala, Mrs.S.Kalyani, Mr.M.K.Varadarajan, Mrs.S.M.Mehzabeen, Mr.P.Arul, Mrs.S. Mary Cynthia, Dr. M Kavitha, Mr.L.K.Balaji Vignesh, Mr.D.Silambarasan completed an online certification course on “Fundamentals of Deep Learning” (NVIDIA DLI Certificate)
- Dr.T.J.Jeyaprabha completed AICTE-FDP-NPTEL online certification course on Cyber Security and Privacy (Aug-Oct 2023) 12 Week Course.
- Mr.LK.Balaji Vignesh completed AICTE-FDP-NPTEL online certification course on Nanophotonics, Plasmonics, And Metamaterials (Aug-Oct 2023) 12 Week Course.
- Dr.T.J.Jeyaprabha has successfully completed the course spanning over 12 modules on 04.10.2023. This training is a part of the “ENERGY LITERACY TRAINING” of the Energy Swaraj Foundation.

STUDENT ACTIVITIES

(Co-curricular Activities/Extra-curricular Activities):

- 11 ECE students participated in “ILLUMINATE-The Entrepreneurship Workshop”, a prestigious collaboration with E-Cell, IIT Bombay. On October 30th, 2023 from 9 am-3 pm.
- As Per the instructions from the Deputy Secretary to Government, Higher Education (A) Dept, Secretariat, Chennai 600 009, it was planned to play the video of the ISRO Scientists felicitation to all the students on 09.10.2023. Our ECE students of all the year and sections witnessed the program.



- “Interaction with students on success story of Chandrayaan-3” a program organized by Anna University , Chennai has been live telecasted in the classroom and Laboratories on 16.10.2023 by 2:30 PM. Our ECE students of all the year and sections witnessed the program.



STUDENT ACHIEVEMENTS:

- Ms.E.Divyashree has participated in Invente'23 a national level tech-fest and won the 2nd position in solder IT event, organized by SSN College of Engineering, Chennai held on 06.10.2023.
- Ms.V.Anushree (I year A Batch) has achieved first place in Art Exhibition in “Chandrayan Utsav” organized by SVCE science club at SVCE held on 16.10.2023.



- Our college Badminton (Men), Table Tennis(Women) and Ball Badminton (Men) teams showed a stunning performance and clinched the following positions in Anna University zonal tournament 2023. Badminton(Men)-Winners (Organized by SVCE on 16th&17th Oct 23, Table Tennis (Women)-Runners (Organized by SMIT on 09th Oct 23) and Ball Badminton(Men)-Third (Organized by CEG on 13th Oct 23)
- SHASHIDAR G-IV year ECE, SATHYAJITH G II year ECE, YAZHINI S III year ECE, KARTHICK RAJA P II year ECE, SUNDARESH K I year ECE were part of the SVCE team .



- Our SVCE students participated in ANNA UNIVERSITY TABLE TENNIS TOURNAMENT 2023 and bagged the Winner title. ARUNACHALAM S III year ECE was part of it.

(12) PATENT APPLICATION PUBLICATION (21) Application No.202341058912 A
 (19) INDIA
 (22) Date of filing of Application :02/09/2023 (43) Publication Date : 06/10/2023

(54) Title of the invention : A SYSTEM BASED ON ML FOR DETERMINING A CHANNEL STATE FOR WIRELESS COMMUNICATION



PATENT PUBLISHED/GRANTED:

- Mrs.K.Srividhya, Dr.D.Menaka, Mrs.K.S.Subhashini, Mrs.S.Kalyani and Mrs.L.Anju, Department of Electronics and Communication Engineering, has published a Patent titled “A system based on ML for determining a channel state for Wireless Communication”, in IPR. Application No. 202341058912 A, filed on 2/9/2023 and Published on 06.10.2023.

(51) International classification G06N002000000, H04W0004020000, G16H0000200000, G06N0005040000, H04W0024020000	(71) Name of Applicant : 1)Mrs.K.Srividhya Address of Applicant :Assistant Professor, Department of Electronics and Communication Engineering, Sri Vinayakswara College of Engineering, Pennalar Village, Chennai - Singaperumal High Road, Sengaperumbur Tk. - 602 117, Kanchipuram Dist., Tamil Nadu, India ----- 2)Dr.D.Menaka 3)Mrs.K.S.Subhashini 4)Mrs.S.Kalyani 5)Mrs.L.Anju Name of Applicant : NA Address of Applicant : NA
(52) Divisional to Application Number Filing Date : NA	(72) Name of Inventor : 1)Mrs.K.Srividhya Address of Applicant :Assistant Professor, Department of Electronics and Communication Engineering, Sri Vinayakswara College of Engineering, Pennalar Village, Chennai - Singaperumal High Road, Sengaperumbur Tk. - 602 117, Kanchipuram Dist., Tamil Nadu, India ----- 2)Dr.D.Menaka Address of Applicant :Associate Professor, Department of Electronics and Communication Engineering, Sri Vinayakswara College of Engineering, Pennalar Village, Chennai - Singaperumal High Road, Sengaperumbur Tk. - 602 117, Kanchipuram Dist., Tamil Nadu, India ----- 3)Mrs.K.S.Subhashini Address of Applicant :Assistant Professor, Department of Electronics and Communication Engineering, Sri Vinayakswara College of Engineering, Pennalar Village, Chennai - Singaperumal High Road, Sengaperumbur Tk. - 602 117, Kanchipuram Dist., Tamil Nadu, India ----- 4)Mrs.S.Kalyani Address of Applicant :Assistant Professor, Department of Electronics and Communication Engineering, Sri Vinayakswara College of Engineering, Pennalar Village, Chennai - Singaperumal High Road, Sengaperumbur Tk. - 602 117, Kanchipuram Dist., Tamil Nadu, India ----- 5)Mrs.L.Anju Address of Applicant :Assistant Professor, Department of Electronics and Communication Engineering, Sri Vinayakswara College of Engineering, Pennalar Village, Chennai - Singaperumal High Road, Sengaperumbur Tk. - 602 117, Kanchipuram Dist., Tamil Nadu, India -----

(57) Abstract:
 The invention introduces a novel system designed to determine the state of wireless communication channels harnessing the capabilities of machine learning. Instead of relying on static parameters, this system is trained on historical channel data and processes real-time data to dynamically adjust wireless communication parameters, ensuring optimal signal transmission and reception. The system exhibits adaptability and scalability across various wireless ecosystems, from smartphones to IoT devices. As the system encounters new data, it refines its models, enhancing its predictive accuracy over time. Additionally, the system integrates external data sources, like geographical information, to further augment its predictions, making it suitable for diverse applications, including emergency response and crowded environments. The proposed system aims to revolutionize wireless communication, making it more reliable, efficient, and adaptive. Accompanied Drawing [FIGS. 1-2]
 No. of Pages : 21 No. of Claims : 10

- Dr. M. Kavitha, Mr. L.K. Balaji Vignesh along with their colleagues have granted a design Patent titled “IoT Based Wearable Medical Monitoring Device” in the Indian Patent Office. Details of Patent: Application 392312-001 was filed on 09/08/2023, and granted on 26/10/2023.



REVIEWER/EDITORIAL BOARD MEMBER:

- Dr.T.J.Jeyaprabha, Mr.L.K.Balaji Vignesh acted as reviewer for Third IEEE International Conference on Mobile Networks and Wireless Communications [ICMNWC-2023 @SSIT, Tumkur]
- Dr.M.Kavitha reviewed an article titled "Knowledge Graph-based Multi-context-aware Recommendation Algorithm" in Indonesian Journal of Electrical Engineering and Computer Science.



FACULTY ACHIEVEMENTS:

- Dr.A.Prasanth inclusion as World Top 2% Scientist, published by Elsevier & Stanford University.
- Dr.D.Menaka delivered a a technical talk on "Implementation of Image data processing and analysis" in three days Faculty Development Program on "Deep Learning Techniques for Image Analysis-Hands on Session" organized by the Department of Electronics and Communication Engineering, Sri Venkateswara College of Engineering, Sriperumbudur from 03.10.2023 to 05.10.2023.

- Mrs.B.Sarala, Dr.R.Priyadharshini, Mr.L.K.Balaji Vignesh acted as a jury in UPAGRAHA'23 (National Level Technical Symposium) for the event "Bit Flow" organized by the Department of ECE, SVCE in association with Forum of Data Science Engineers and IETE Chennai Centre on 12.10.2023
- Mr.L.K.Balaji Vignesh delivered a technical talk on "Recent Trends in Antenna Design using ADS Tool" in two days Value Added Course Program organized by the Department of Electronics and Communication Engineering, Solamalai College of Engineering, Madurai on 26.10.2023.
- Dr.T.J.Jeyaprabha and Mr.S.Elangovan organized UPAGRAHA'23-Two Day National Level Technical Symposium from 11/10/2023 to 12/10/2023 under ECE Association, IETE Students Forum and Robotics and Artificial Intelligence Club. A variety of technical events were organized by the ECE students and judged by the ECE Department faculty. 350 Students from various Engineering Institutions participated and benefited. Two Key note sessions were delivered by Smt.Ramya Gowrisankaran, AGE, NEC on 11.10.2023 and Dr.V.Narayanan, Director, LPSC, ISRO on 12.10.2023.

EVENTS ORGANIZED:

- Dr.A.Prasanth, Mr.N.Sathish, Mr.V.Yokesh and Ms.B.Elakiya have organized the Three Days FDP on "Deep Learning Techniques for Image Analysis-Hands on Session" from 03.10.2023 to 05.10.2023.





- L.K.Balaji Vignesh organized a guest lecture on “Autonomous Cars” in association with IETE Students Forum on 18.10.2023 from 9.30 a.m to 12.05 p.m at Digital Signal Processing Laboratory for III Year and IV Year ECE Students. The session was handled by Mr.C.Dhanasekar, Electronics Team Leader (Hardware Expert), Valeo India Private Limited, Chennai. The event was really interactive and students gained more knowledge on different equipment used in global cars.



- Dr.A.Prasanth, Mr.N.Sathish, Mr.V.Yokesh, Mr. P. Arul have organized International Conference on Intelligent Computing and Next Generation Wireless Networks (EAI ICNGWN 2023) held on 19.10.2023 to 20.10.2023



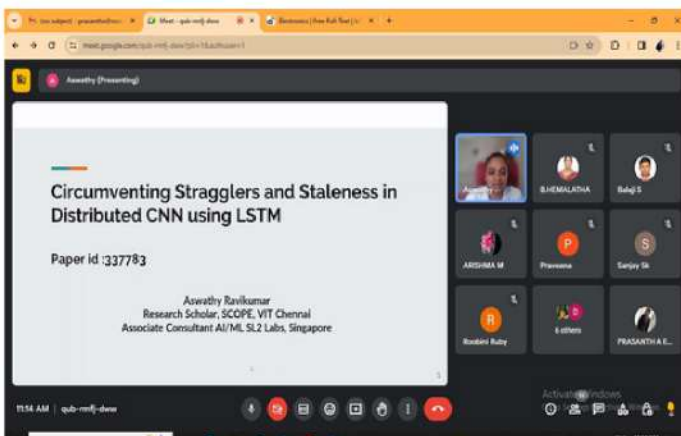


PALS:

- One team had submitted Project Proposal for PALS INNOWAH contest under the theme Startup Solutions for Sustainability Challenges
- 06 students and 05 faculty participated in the PALS INDUSTRY-ASSISTED LECTURES SERIES in AI for IOT.

ALUMNI ACTIVITIES:

- Mr.Rahil jain, Software Engineer, Temenos India Pvt Ltd, 2017-21 batch ECE alumnus delivered a lecture “An insight on reinforcement learning” on 17.10.2023



MOU SIGNED WITH INDUSTRIES:

- MoUs were signed with two industries, viz., M/s. SPEL Semiconductor Limited, Maraimalai nagar, Chennai and M/s. Chip Test Engineering Limited, Chennai to carry out the academic activities involving students and faculty members in association with the industries.
- Also, a Non-Disclosure Agreement (NDA) document was digitally signed by our principal as a part of signing a MoU with HCL Technologies Limited. MoU documents will be signed in due course of time.

INDUSTRIAL VISIT:

- Around 173 Students from third-year ECE have undergone Industrial visit to BSNL Rajiv Gandhi Memorial Telecom Training Centre, Meenambakkam, Chennai from 09.10.2023 and 10.10.2023.

- Dr.G.A.Sathish Kumar, HOD/ECE and Mr.S.P.Sivagnana Subramanian, AP/ECE had visited M/s. SPEL Semiconductor Limited, Maraimalai nagar, Chennai on 27.10.2023. The complete processing stages of manufacturing Integrated Chips was exposed to us and well explained by Mr. P.Balamurugan, Head (Operations) cum Whole time Director and his team. This was a useful visit to get to know about the IC manufacturing and testing.



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