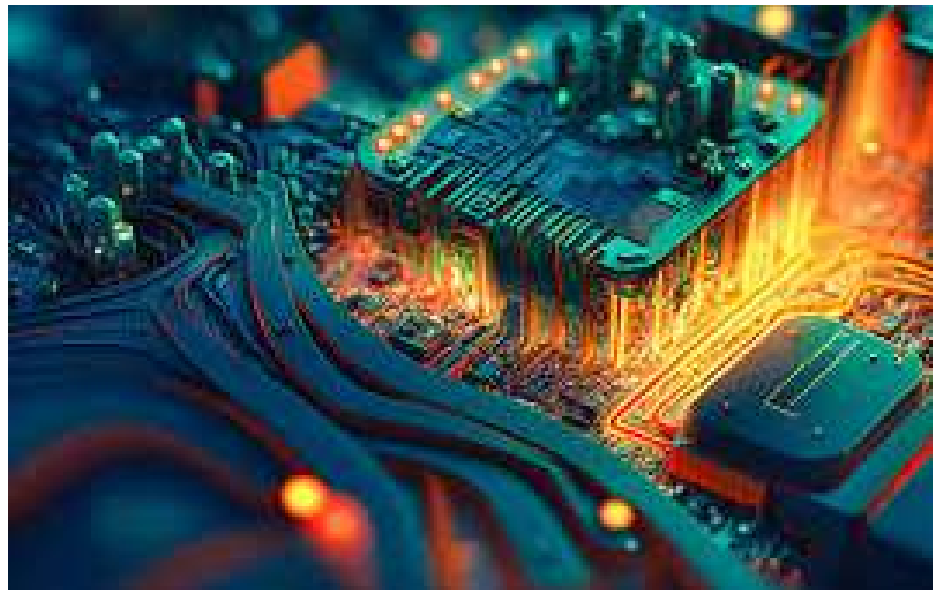SVCE | Sri Venkateswara College of Engineering

CIRCUIT TIMES

INSIGHTS

- Faculty Article
- Faculty Participation
- Faculty Proposal Submission
- Faculty Publication
- Student Participation
- Academic Events
- Faculty Achievements
- Alumni Testimonial

VISION OF 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 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.

FACULTY ARTICLE

BEHAVIORAL BIOMETRICS FOR CONTINUOUS AUTHENTICATION IN THE INTERNET OF THINGS ERA: AI

Mr.M.K.Varadarajan, M.E., (Ph.D),

Assistant Professor, Department of Electronics and Communication Engineering,
Sri Venkateswara College of Engineering (Autonomous), Sriperumbudur

INTRODUCTION

With the flourishing of IoT, day to day life is being transformed by ambient intelligence along with massive connected IoT devices ranging from smartphones and wearables to robots, autonomous vehicles and drones. The broad penetration of IoT devices in consumer market makes user authentication critically important to secure users have the appropriate right to access IoT devices and to avoid the devastating damages caused by one attack occurring in the local vulnerable spots. Apart from the security concerns, user authentication is beneficial for passive and customized services when the user switching occurs.

For example, for one autonomous car shared among family members, the driving habits among family members differ significantly. To assist the drivers, different assistance strategies can be applied based on user identities. Thus, user authentication can protect crucial information against potential attacks and offer customized services for improved user experience. Due to the importance of user authentication, researchers and industries are increasingly studying the development of sophisticated methods to verify and recognize user identities.

CLASSIFICATION OF AUTHENTICATION SYSTEM

An overview of credentials for user authentication and identification and their application. Authentication systems can be divided into three categories:

• Knowledge-based authentication explicitly requests user to enter credentials such as password, personal identification number (PIN) and graphical PIN to confirm the identity of an individual.

• Physiological biometric based authentication uses biological traits (e.g. fingerprint, iris, and facial images) and employs the machine learning methods to discriminate user identities.

• Behavioral biometrics including walking gait, keystroke and touchscreen dynamics are used for user authentication as well. Authentication systems can be classified into two sub-categories: user authentication to detect whether the user is one unauthorized visitor or genuine user and user identification.
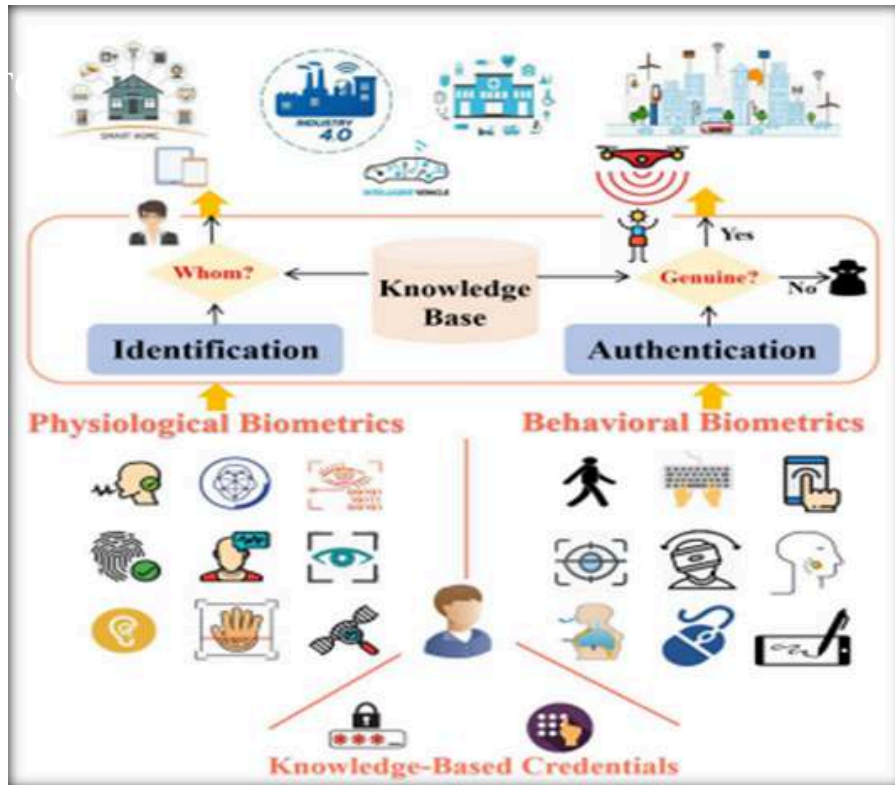

Figure 1 Classification of Authentication System

The essence of authentication systems is to build the mapping relationship between users and objectives. According to the object-user mapping relationship, authentication systems can be categorized as
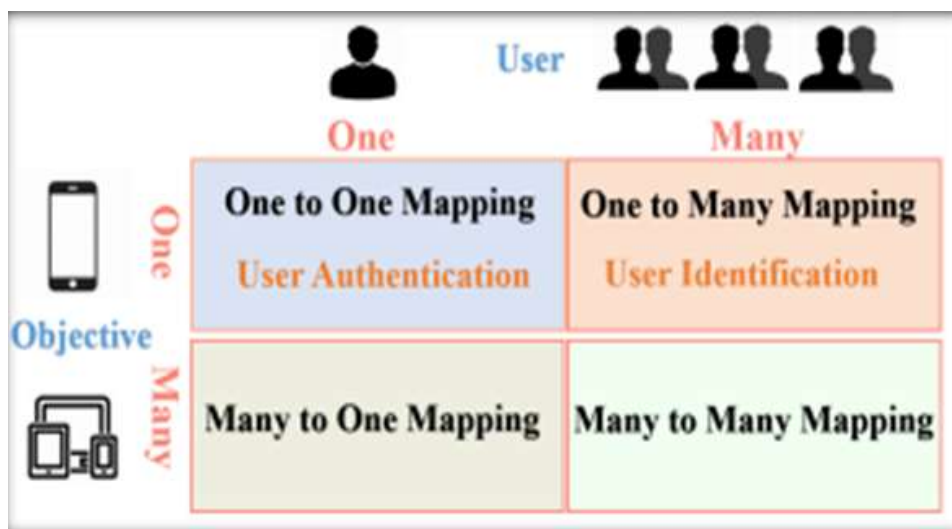

Figure 2 Mapping relationship between Devices and User

Among them, one-to-one mapping aims to verify whether the user is the genuine user or imposter for one privately-owned device (such as mobile phones and laptops) or one mobile application. One-to-many mapping provides the appropriate access control among multiple users for one object shared within a group of persons. In IoT systems, numerous smart devices are connected to provide pervasive services for one user (such as smart home and vehicle-to-vehicle systems. In the dynamic environment participants need to finish one session across shared IoT devices where complex and robust authentication schemes are needed. The many-to-one mapping and many-to-many mapping fit well for the user authentication in complex dynamic environment. Although numerous user authentication and identification methods are proposed, prior methods have several key drawbacks as it pertains to their fit with IoT applications:

CHARACTERIZING BEHAVIORAL BIOMETRICS

Behavioral biometrics refers to the unique behavioral traits that can be used for human authentication. User authentication based on behavioral biometrics is characterized as secure, continuous, transparent, and cost effective. Knowledge-based credentials and physiological biometrics, behavioral biometrics provides a dynamic modality that is completely passive and works in the background, making it impossible to copy or steal. Behavioral biometric data are extracted when users are performing one specified activities. Unlike the static authentication information, the nature of behavioral biometric data ensures that they cannot be forgotten, exchanged, and stolen.

Unlike the one-time authentication that is enforced at the beginning of a session or login, continuous user authentication is an essential requirement to verify that users are who they claim to be on an ongoing basis. In order to achieve this goal, behavioral biometrics continuously profile a user's behavior based upon the natural interactions without having to constantly interrupt users. The continuity of behavior makes it a nature way for continuous authentication with no distraction for users. Unobtrusive sensing aims to monitor physical activities and behaviors continuously via sensors embedded in ambient environment or wearable sensors and maximize the user experience to avoid disturbing users from the undergoing tasks. Behavioral data can be sampled when users are interacting with IoT devices or ambient environments with no explicit input. Moreover, user authentication can be performed in a transparent and unobtrusive way with no distraction for users.

Previous attempts to continuously authenticate may have been too disruptive (e.g., prompts mid-session), but now by using unobtrusive sensing techniques users can be continuously authenticated without interruption. This feature is beneficial for the enhancement of user experience, and provides more secure protection for IoT devices. Cost Effective: Physiological biometrics usually relies on customized hardware for information acquisition. This is often expensive in terms of costs and impedes the widespread adoption of physiological biometrics for user authentication. In contrast, behavioral biometrics can be observed and sampled with embedded sensors in IoT devices (e.g., microphone, touchscreen, accelerometer in smart phone and wearable devices) or public facilities (e.g., Wi-Fi access point and surveillance camera). The widespread availability of IoT devices makes it possible to sense behaviors without extra hardware, which improves the acceptance of behavioral biometrics with low cost and ease of use.

SENSING OF BEHAVIORAL BIOMETRICS

Numerous behavioral traits have been explored for continuous authentication. In this section, we analyze the commonly used behavioral traits for use authentication, and conduct comprehensive comparison from different dimensions including vulnerability, discreteness, obtrusiveness and privacy.

a)Keystroke Dynamics

Keystroke dynamics characterize the typing rhythm such as keystroke length, distance between consecutive strokes, the pressure exerted on each key when the individual types characters and others. To date, keystroke-powered authentication has been broadly explored for devices equipped with physical keyboards. With the emergence of touchscreens, when users enter characters via touchscreens, subtle changes of built-in sensors including accelerometer and gyroscope occur. Jointly combined with the status of built-in sensors, the keystroke timing, touch-typing and keystroke pressure are distinctive features for user identification.

Similarly, mouse usage dynamics have also been shown to serve as potential authentication cues. The advantages of analyzing keystroke dynamics include the unobtrusive data collection and continuous monitoring of typing behaviors when users interact with devices simultaneously. However, the keystroke dynamics vary in different scenarios such as walking, holding at hand and putting on table.

b)Touchscreen Dynamics

With the prevalence of touchscreen in IoT devices, interaction patterns including pressure intensity and sliding dynamics when users interact with touchscreen enable the detection of user identification in an unobtrusive way. The touch patterns with conventional authentication method such as PIN codes or shaped-based drawing when individuals are running the log-in session. Even though more patterns are extracted to protect the devices against potential attacks, the authentication method is still static.

For continuous authentication, touch operations provides one natural way to collect user interaction data. Moreover, it makes the continuous user identification possible with no extra sensors and low computational load. Therefore, systematically studying application dependent touch patterns can help protect against unauthorized access of crucial mobile applications. This is especially true when individuals are likely to possess more than one mobile devices.

c)Walking Gait

Identifying and authenticating based on walking gaits is an emerging biometric technology which recognizes user's identities by analyzing walking patterns. Based on the strategies of data acquisition, the sensing strategies of gait signals can be grouped as: facility cameras, floor sensors and wearables.
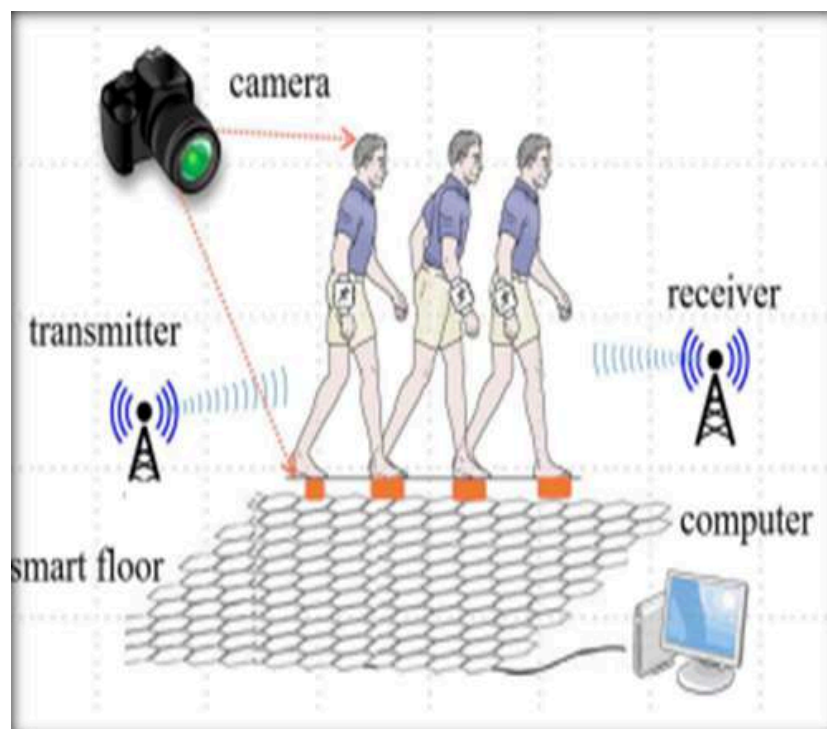
Figure 3 User authentication and identification based on walking gaits via different sensors

a)Eye Movement

Driven by the internal interaction relationship between muscles and brain neural, eye movements including gaze and blinking are significantly different for individuals and are difficult to be mimicked and duplicated. Authentication based on eye movements can be divided into two categories in terms of data signals. The dynamics of eye movements including pupillary response to stimuli, pupil size, velocity, acceleration and spatial/geometric features are recorded and analyzed from video. Patterns were intrinsic and could be applied for user identification.

CONCLUSION

In IoT era, user authentication and identification are critical to ensure the security of connected things and the customization of passive services. Conventional Identification Methods suffer from several key drawbacks including discreteness, obtrusiveness and vulnerability. In this article, the proposed system can be identified by continuous authentication based on behavioral biometrics, characterize the key features of CA based on user behaviors and summarize the existing CA solutions from sensing and computing.

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FACULTY PARTICIPATION

(SEMINAR/FDP/STTP/WORKSHOP/ONLINE COURSE/CONFERENCE)

- **Dr.T.J.Jeyaprabha** participated in Webinar titled **"Security Challenges in VANETs & Game Theory Approaches"** organized by the Department of Computer Science and Engineering, RAAK College of Engineering and Technology on 05.04.2024

- **Dr.R.Priyadharshini** attended two weeks International FDP (Online) on **"Advancements in Quantum Computing and Sensor Technology for Viksit Bharat @2047"** organized by Department of Electronics and Communication Engineering, The Oxford College of Engineering, Bengaluru from 15.04.2024 to 27.04.2024

- **Dr.T.J.Jeyaprabha** participated in Online FDP on **"Cyber Security and SIEM" (Powered by QRadar)** in association with IBM organized by the Department of Information Technology, Sri Venkateswara College of Engineering from 22.04.2024 to 26.04.2024

FACULTY PROPOSAL SUBMISSION

- **Dr.S.R.Malathi, Dr.M.Athappan and Mr.D.Silambarasan** submitted three Days Seminar proposal to AICTE-VAANI Scheme (Vibrant Advocacy for Advancement and Nurturing of Indian Languages) on the topic **"Artificial Intelligence and Growth of Semiconductor Technologies"** on 10.04.2024

- **Dr.M.Bindhu, Dr.M.Kavitha and Mr.L.K.Balaji Vignesh** submitted three Days Seminar proposal to AICTE-VAANI Scheme (Vibrant Advocacy for Advancement and Nurturing of Indian Languages) on the topic **"Enhancing Next-Gen Communication with Outcome based Education for Sustainability and Energy Efficiency"** on 10.04.2024

FACULTY PUBLICATION

- **Dr.T.J.Jeyaprabha,** Mrdulla Naarayan V, Jeevanandh Ravi, Naresh S presented a paper titled **"Innovative Solar Energy Integration for Battery-Less Mobile Phones"** in 9th International Conference on Nanoelectronics, Computational Intelligence & Communication Systems (NCCS-2024) organized by ISVE Ranchi at Advanced Regional Telecom Training Centre, BSNL, Hazaribag Road, Ranchi-835217, Jharkhand, India from 13.04.2024 to 14.04.2024

- Avinash P, Ganeshan H, Hemkumar V, Dr.N.Kumaratharan presented a paper titled "Gyro and Accelerometer-Based Head Gesture Detection for Intelligent Interfaces" at National Conference on Signal Processing, Communication and Networking (NCSPCN-24) organized by the Department of Electronics and Communication Engineering, Sri Venkateswara College of Engineering, Sriperumbudur on 16.04.2024

- Mohanraj, **Dr.P.Jothilakshmi,** R.Mohana Sundaram presented a paper titled **"Simulation of Flower Shaped Antenna for X-Band Applications"** at National Conference on Signal Processing, Communication and Networking (NCSPCN-24) organized by the Department of Electronics and Communication Engineering, Sri Venkateswara College of Engineering, Sriperumbudur on 16.04.2024

- **Dr.R.Gayathri,** Leann Elizabeth James, Nareesh U D, Narain Muralidharan presented a paper titled **"IOT Based Smart Wheelchair for Enhanced Mobility and Independence"** at National Conference on Signal Processing, Communication and Networking (NCSPCN-24) organized by the Department of Electronics and Communication Engineering, Sri Venkateswara College of Engineering, Sriperumbudur on 16.04.2024

- Shanmathi, **Dr.R.Gayathri** presented a paper titled **"Accurate Breast Cancer Detection Using ANN and GMM Segmentation"** at National Conference on Signal Processing, Communication and Networking (NCSPCN-24) organized by the Department of Electronics and Communication Engineering, Sri Venkateswara College of Engineering, Sriperumbudur on 16.04.2024

- **Dr.R.Gayathri,** Kavya S K, Mahisha P, Nishadharshini N presented a paper titled **"Bone Cancer Detection: Enhancing Early Diagnosis and Treatment Through Advanced Computational Techniques"** at National Conference on Signal Processing, Communication and Networking (NCSPCN-24) organized by the Department of Electronics and Communication Engineering, Sri Venkateswara College of Engineering, Sriperumbudur on 16.04.2024

FACULTY PUBLICATION

- **Dr.R.Gayathri,** J.Buvana presented a paper titled **"Robust Key Derivation in Mining for Blockchain Network Using Cryptographic Hash Functions and Voting Based Algorithm"** at National Conference on Signal Processing, Communication and Networking (NCSPCN-24) organized by the Department of Electronics and Communication Engineering, Sri Venkateswara College of Engineering, Sriperumbudur on 16.04.2024

- **Dr.R.Gayathri,** S.Nandhini presented a paper titled **"Liver Computed Tomography Image Analysis and Abnormality Classification in Machine Learning"** at National Conference on Signal Processing, Communication and Networking (NCSPCN-24) organized by the Department of Electronics and Communication Engineering, Sri Venkateswara College of Engineering, Sriperumbudur on 16.04.2024

- **Dr.R.Gayathri,** Keerthana D, Nivetha P, Pooja Varadarajan presented a paper titled **"Neuro-Bionic Prosthetic Hand Control Using EEG"** at National Conference on Signal Processing, Communication and Networking (NCSPCN-24) organized by the Department of Electronics and Communication Engineering, Sri Venkateswara College of Engineering, Sriperumbudur on 16.04.2024

- **Dr.R.Gayathri,** S.Manju, Tanaya Kanung presented a paper titled **"A Review for AI/ML Implemented in Micro Electronics"** at National Conference on Signal Processing, Communication and Networking (NCSPCN-24) organized by the Department of Electronics and Communication Engineering, Sri Venkateswara College of Engineering, Sriperumbudur on 16.04.2024

- **Dr.R.Gayathri,** Pushpapriya, S.Manju, Tanaya Kanung presented a paper titled **"Empowering Mobility: The Evolution and Impact of Wheelchairs in Rehabilitation"** at National Conference on Signal Processing, Communication and Networking (NCSPCN-24) organized by the Department of Electronics and Communication Engineering, Sri Venkateswara College of Engineering, Sriperumbudur on 16.04.2024

- **Dr.D.Menaka,** Mervin Jerel D, Moneshwar C, Naveenkumar S presented a paper titled **"Decrypting theft suspects in low-resolution snapshots"** at National Conference on Signal Processing, Communication and Networking (NCSPCN-24) organized by the Department of Electronics and Communication Engineering, Sri Venkateswara College of Engineering, Sriperumbudur on 16.04.2024

- **Dr.T.J.Jeyaprabha,** VishnuPriya VT, Sreevatsav E, Srivarshni S presented a paper titled **"Oil Spill and Solid Waste Collector Robot"** at National Conference on Signal Processing, Communication and Networking (NCSPCN-24) organized by the Department of Electronics and Communication Engineering, Sri Venkateswara College of Engineering, Sriperumbudur on 16.04.2024

FACULTY PUBLICATION

- **Mr.S.P.Sivagnana Subramanian,** Sai Sundar K, Sarveshwar V, Vijay K presented a paper titled **"Traffic Sign Detection with Occlusion Using YOLO 7"** at National Conference on Signal Processing, Communication and Networking (NCSPCN-24) organized by the Department of Electronics and Communication Engineering, Sri Venkateswara College of Engineering, Sriperumbudur on 16.04.2024

- Kalaiselvi M R, Preetham S, **Mrs.S.Kalyani** presented a paper titled **"Advanced Steering Mechanism Using Electronic Control Unit"** at National Conference on Signal Processing, Communication and Networking (NCSPCN-24) organized by the Department of Electronics and Communication Engineering, Sri Venkateswara College of Engineering, Sriperumbudur on 16.04.2024

- **Mrs.R.Kousalya,** Rajit H, Srivani M, Sanjay Lokesh A M presented a paper titled **"Robust Authentication and Encryption Protocol for Military applications"** at National Conference on Signal Processing, Communication and Networking (NCSPCN-24) organized by the Department of Electronics and Communication Engineering, Sri Venkateswara College of Engineering, Sriperumbudur on 16.04.2024

- **Mr.P.Muthukumaran,** Muthukumar S, Prasanna A, Preetham Raj M B presented a paper titled **"LoRa-Based Paddy Field Monitoring System for Remote Sensing of Agricultural Parameters"** at National Conference on Signal Processing, Communication and Networking (NCSPCN-24) organized by the Department of Electronics and Communication Engineering, Sri Venkateswara College of Engineering, Sriperumbudur on 16.04.2024

- **Mrs.B.Sarala, Rakshana S,** Sahana Balasubramaniam, Sakthi Maheswari M presented a paper titled **"Cardless and Secure ATM Cash Withdrawal"** at National Conference on Signal Processing, Communication and Networking (NCSPCN-24) organized by the Department of Electronics and Communication Engineering, Sri Venkateswara College of Engineering, Sriperumbudur on 16.04.2024

- Pranav A, Kavinkarthic RB, Naveen Kumar C, **Mr.M.K.Varadarajan** presented a paper titled **"Smart Energy Monitoring for Efficient Monetization Using ESP32"** at National Conference on Signal Processing, Communication and Networking (NCSPCN-24) organized by the Department of Electronics and Communication Engineering, Sri Venkateswara College of Engineering, Sriperumbudur on 16.04.2024

- **Mrs.S.M.Mehzabeen,** Navin Kumar, Mansoor Bin Fashila, Jishnupriya.M.D presented a paper titled **"Tendon Driven Continuum Robot (TDCR) for Exploration and Rescue in Dynamic Environments"** at National Conference on Signal Processing, Communication and Networking (NCSPCN-24) organized by the Department of Electronics and Communication Engineering, Sri Venkateswara College of Engineering, Sriperumbudur on 16.04.2024

FACULTY PUBLICATION

- Abu Akash B, Dinesh Adhithya S B, Gokul E, **Dr.A.Ramya** presented a paper titled **"Early Crack Detection of Railway Track"** at National Conference on Signal Processing, Communication and Networking (NCSPCN-24) organized by the Department of Electronics and Communication Engineering, Sri Venkateswara College of Engineering, Sriperumbudur on 16.04.2024

- Hari Narayanan V, HemanthK V, **Mrs.S.M.Abinaya** presented a paper titled **"Design and Analysis of 16-Bit Vedic Multiplier"** at National Conference on Signal Processing, Communication and Networking (NCSPCN-24) organized by the Department of Electronics and Communication Engineering, Sri Venkateswara College of Engineering, Sriperumbudur on 16.04.2024

- **Dr.M.Kavitha,** Kabilan S, Santhosh Kumar P presented a paper titled **"Smart Mountain Climbers Health Monitoring and Position Tracking"** at National Conference on Signal Processing, Communication and Networking (NCSPCN-24) organized by the Department of Electronics and Communication Engineering, Sri Venkateswara College of Engineering, Sriperumbudur on 16.04.2024

- **Mr.L.K.Balaji Vignesh,** P.Vasanth, R.Shivaganapathy, V.S.Prithivi Raj presented a paper titled **"Wireless Power for IoT Connectivity"** at National Conference on Signal Processing, Communication and Networking (NCSPCN-24) organized by the Department of Electronics and Communication Engineering, Sri Venkateswara College of Engineering, Sriperumbudur on 16.04.2024

- **Mr.D.Silambarasan,** Akash G, Aukshay R B, Bala Seshanth R, presented a paper titled **"Design of High-Speed Multiplication and Accumulation Unit for DSP Applications"** at National Conference on Signal Processing, Communication and Networking (NCSPCN-24) organized by the Department of Electronics and Communication Engineering, Sri Venkateswara College of Engineering, Sriperumbudur on 16.04.2024

- **Dr.R.Gayathri,** Nivetha Dr, Priyadharshini S, Priyadharshni B presented a paper titled "Prediction of Eye Diseases Based on Retinal Images-Retina Scan: Proactive Eye Health Monitoring Through Image Analysis" at National Conference on Signal Processing, Communication and Networking (NCSPCN-24) organized by the Department of Electronics and Communication Engineering, Sri Venkateswara College of Engineering, Sriperumbudur on 16.04.2024

- Saambavi PU, Lathikaa Shri S, Koushika Devi S, Dr.R.Gayathri presented a paper titled "Robust Plastic Debris Detection in Maritime Environments Using Convolutional Neural Network (CNN)" at National Conference on Signal Processing, Communication and Networking (NCSPCN-24) organized by the Department of Electronics and Communication Engineering, Sri Venkateswara College of Engineering, Sriperumbudur on 16.04.2024
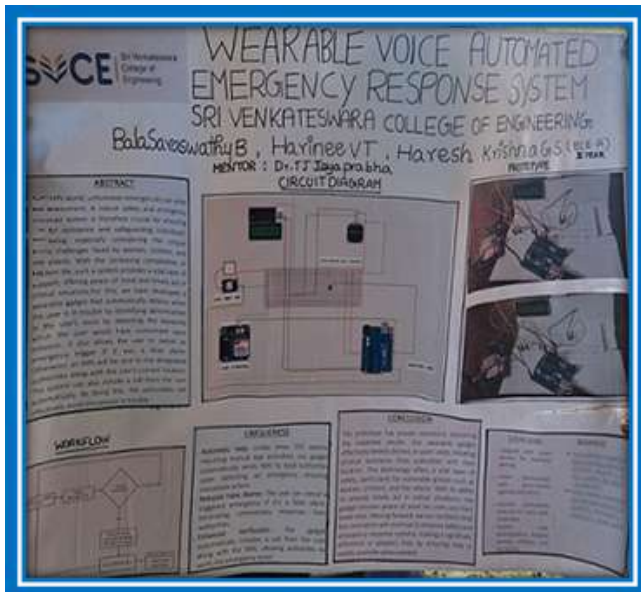
STUDENT PARTICIPATION

(Co-curricular Activities/Extra-curricular Activities)

Highlights

- Around **85 ECE students** participated in **Students Research Day (SVCE INNOVATES 2024)** organized by Sri Venkateswara College of Engineering, Sriperumbudur on 16.04.2024

- **Around 46 ECE students** participated in National Conference on Signal Processing, Communication and Networking (NCSPCN-24) organized by the Department of Electronics and Communication Engineering, Sri Venkateswara College of Engineering, Sriperumbudur on 16.04.2024

- Three teams of ECE students have submitted their idea in **"The Inventors Challenge-2024"** organized by All India Council for Technical Education (AICTE), Ministry of Education, India, Arm Education and STMicroelectronics on 30.04.2024

STUDENT ACHIEVEMENTS

(Co-curricular Activities/Extra-curricular Activities)

- **Bala Saraswathy B, Harinee V T, Haresh Krishna GS** (II Year ECE) presented a project titled **"Wearable Voice Automated Emergency response system" secured first position in Students Research Day (SVCE INNOVATES 2024)** organized by the Alumni Association of ECE on 15.04.2024 **(Mentored by Dr.T.J.Jeyaprabha, Associate Professor/ECE)**

- **Arjun U, Arulmozhivarman P.S, Brindha L** (II Year ECE) participated in Tech Crush, Poster Presentation event titled **"Secure vehicle access control system using fingerprint authentication and Bluetooth communication" and secured second position** organized by the Alumni Association of ECE on 15.04.2024 **(Mentored by Dr.A.Ramya, Assistant Professor/ECE)**

STUDENT PARTICIPATION

(Co-curricular Activities/Extra-curricular Activities)

- **Bala Saraswathy B, Harinee V T, Haresh Krishna GS** (II Year ECE) presented a project titled "**Voice automated Wearable Emergency response system" secured first position** in Students Research Day (SVCE INNOVATES 2024) organized by Sri Venkateswara College of Engineering, Sriperumbudur on 16.04.2024 **(Mentored by Dr.T.J.Jeyaprabha, Associate Professor/ECE)**
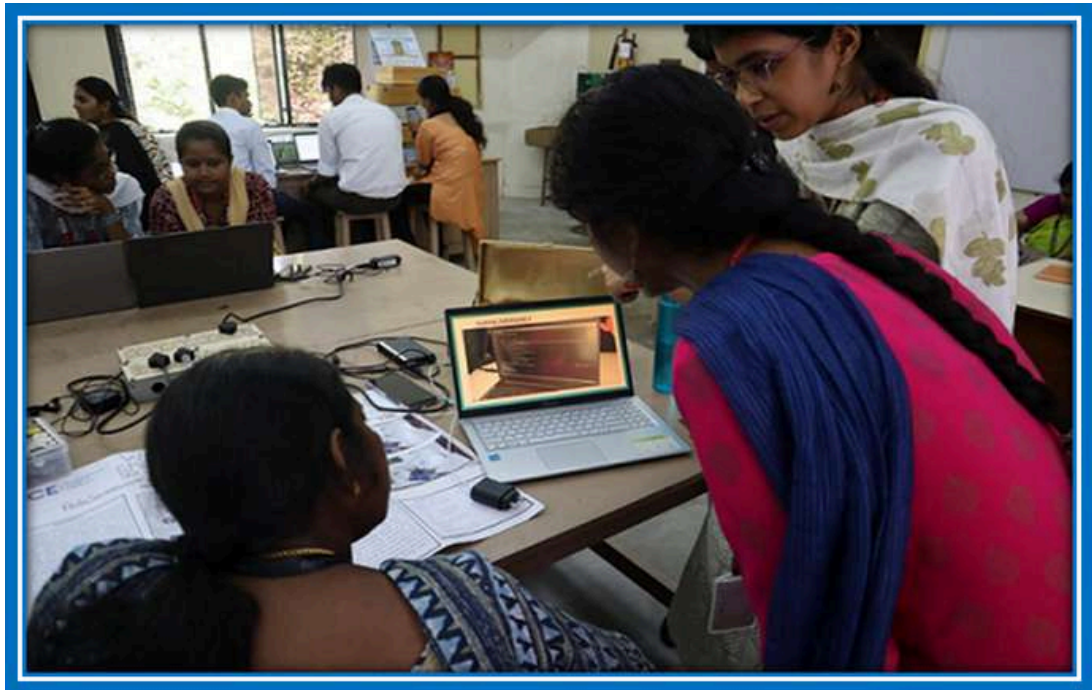
STUDENT PARTICIPATION

(Co-curricular Activities/Extra-curricular Activities)

- **Roshan M, Theeran A, Vikaash B G (II Year ECE) presented a project titled "Smart GyroGlove for Parkinson's Patients" secured second position** in Students Research Day (SVCE INNOVATES 2024) organized by Sri Venkateswara College of Engineering, Sriperumbudur on 16.04.2024 (Mentored by Mr.P.Arul, Assistant Professor/ECE)

- **Umesh Anandh S, Anish Krishnan** (III Year ECE) presented a project titled **"Refreshable Braille Display" secured third position** in Students Research Day (SVCE INNOVATES 2024) organized by Sri Venkateswara College of Engineering, Sriperumbudur on 16.04.2024 **(Mentored by Mrs.S.M.Mehzabeen, Assistant Professor/ECE and Dr.M.Athappan, Associate Professor/ECE)**

STUDENT PARTICIPATION

(Co-curricular Activities/Extra-curricular Activities)

Sharad L (III Year ECE), Pragatheeshwar (III Year IT) and Abineshwar G (III Year CSE) of **System Zombies (Team Name)** participated in **Hackerrupt'24** and won **Third Place** with a Cash Prize of Rs.5000/- organized by the Department of Computer Science Engineering, SVCE from 28.04.2024 to 29.04.2024 at IITM Research Park **(Mentored by Dr.T.J.Jeyaprabha, Associate Professor/ECE)**

EVENTS ORGANIZED

- FODSE club in association with IETE organized a 24 hours intercollegiate Hackathon Ease The Error 4.0, a flagship event of FODSE from 06.04.2024 to 07.042024.

- The invited dignitaries were Mr. Nanda Kumar Baskaran, Software Engineer III at Walmart (ECE Alumni 2013-17) and Mr. Biju Puthalath Thazha Kuniyil, Head of Ideation and Media Marketing at CoE Larsen & Toubro PT&D Digital Energy Solutions (INDIA).

- The 24-hour hackathon featured 29 teams of 152 students, focusing on domains such as Artificial Intelligence, Machine Learning, Blockchain, Sustainability, Healthcare, Social Impact, EdTech, Data Analytics, Disaster Management, Smart Automation, and an Open Track for innovative ideas.

- In the 1st round of judging, participants were judged by a panel comprising of the chief guest Mr. Nanda Kumar Baskaran, Software Engineer III at Walmart Global Tech and an alumnus of Sri Venkateswara College of Engineering (ECE 2013-2017 batch) and faculty members, Dr. T.J.Jeyaprabha, Associate Professor/ ECE, Mr.P.Muthukumaran, Assistant Professor/ ECE, Mr.S.Elangovan, Assistant Professor/ ECE, Mrs.S.M.Mehzabeen, Assistant Professor/ ECE, Dr.N Devi, Associate Professor / INT, Dr.D.Jayanthi, Associate Professor / INT, Dr. A Indumathi, Associate Professor / INT, Mr. S Siva Alagesh, Assistant Professor/ INT, Ms. M.Sugacini, Assistant Professor/ INT. Round 2 Judges: Maurya Vijay Ramchandran, Erlangen Nuremberg University, PhD in AI (2017-2021 batch, ECE).

EVENTS ORGANIZED

- Saurabh Sonawane, Northeastern University, Boston, Business Analytics (2018-2022 batch, EEE), Shruthi Elanchezhian, University of Texas, Dallas, Business Analytics (2018-2022 batch, ECE). Shruthi S, Waterloo University, Canada, Business Analytics (2018-2022 batch, CSE), Uma Maheswari, Northeastern University, Boston, Business Analytics (2019-2023 batch, ECE).


- The final round was judged by the Chief Guest Mr. Biju Puthalath Thazha Kuniyil, Head of Ideation and Media Marketing at CoE Larsen & Toubro PT&D Digital Energy Solutions (INDIA), alumni of the college, including Mr.Pradeepan, Ms. Swetha Gattu, Ms. Jana Ranjini.

EVENTS ORGANIZED

- Dr.D.Menaka, Mrs.K.S.Subhashini, Mrs.S.Kalyani and Mr.M.K.Varadarajan organized the TechCrush poster presentation competition. The students were able to think innovatively, express their views boldly and be able to show their creativity through their presentations. Nearly 8 teams from 1st and 2nd year of each team consisting of 3 to 4 members have participated and displayed their 8 Posters in different ways. Student Coordinators informed the rules and regulations of the event in presence of Internal Judges. Participants are asked to display their boards in the places that were allotted to them with numbering. In the presence of Judges, student participants presented their thoughts that were displayed on their Posters. Posters were judged by the Professors and Associate Professors of ECE department based on criteria such as innovation, relevance, clarity of presentation, and impact. The prize amount was sponsored by our department alumni.
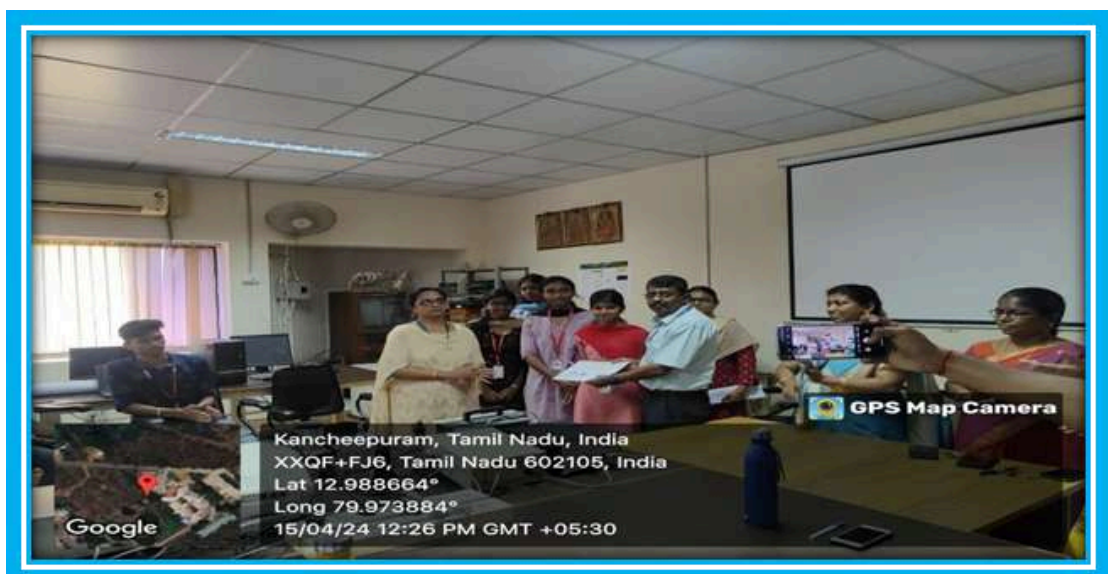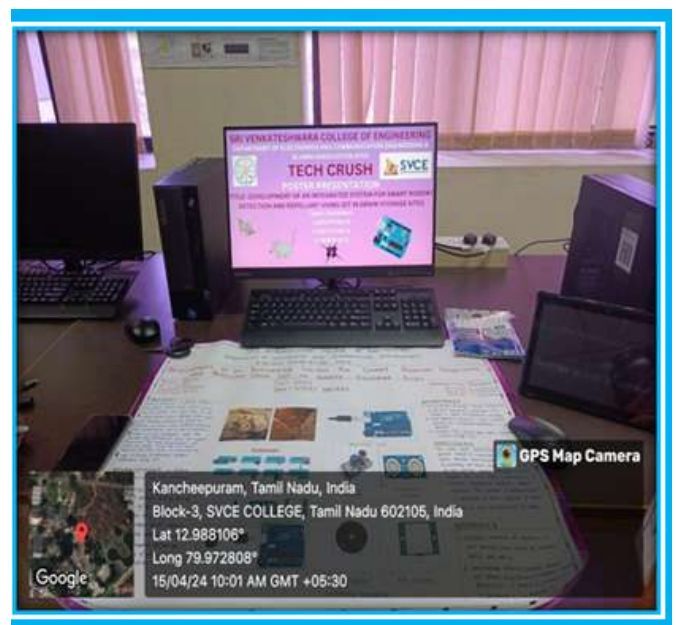
EVENTS ORGANIZED

- The Department of Electronics and Communication Engineering, Sri Venkateswara College of Engineering organized a One-day Online National Conference on **"Signal Processing, Communication and Networking" (NCSPCN'24)** on 16.04.2024. The conference was coordinated by **Dr.R.Gayathri, Professor, Mrs. S M Mehzabeen, Assistant Professor and Dr.A.Ramya, Assistant Professor of the Department of ECE.** The organizing team members were Mrs.K.S.Subhashini, Assistant Professor, Mr.S.P.Sivagnana Subramanian, Assistant Professor, Mrs.S.Kalyani, Assistant Professor, Mrs.R.Kousalya, Assistant Professor, Mrs.B.Sarala, Assistant Professor, Mr.P.Arul, Assistant Professor, Mr.N.Sathish, Assistant Professor, Dr.A.Prasanth, Assistant Professor, Mrs.S.Mary Cynthia, Assistant Professor, Dr.M.Kavitha, Assistant Professor, Mr.L.K.Balaji Vignesh, Assistant Professor, Mr.D.Silambarasan, Assistant Professor of the Department of Electronics and Communication Engineering. The conference began with a prayer song and welcome address by Dr. G.A. Sathish Kumar, Head of the ECE Department. Dr. R. Gayathri introduced the Chief guest to the audience. The Chief guest was Dr.Priyanka Kokil, Professor at IIIT Kancheepuram, released the conference proceedings and delivered the keynote address on "Role of AI in Healthcare".

EVENTS ORGANIZED

- The conference agenda featured six concurrent technical sessions, each focusing on distinct tracks. At the conference, approximately 50 teams showcased their research papers, delivering compelling presentations that captivated the audience. The first session, **Communication & Networking Track-I** took place in the Library Seminar Hall and was overseen by **Dr.Srigitha S.Nath and Dr.P.Jothilakshmi.** Meanwhile, the Biotech Hall hosted Signal Processing Track I, chaired by **Dr.J.S.Leena Jasmine and Dr.D.Menaka.**

- In the Microwave Lab, **Dr. N. Kumaratharan and Dr.M.Bindhu** led the **Communication & Networking Track II.** The Embedded Lab accommodated **VLSI, Embedded and IoT Track I**, led by **Dr. T.J. Jeyaprabha and Dr. Vijayanand**. Simultaneously, **VLSI, Embedded, and IoT Track II** unfolded in the Communication Lab, with **Dr.S.R.Malathi and Dr.M.Athappan** at the helm. Lastly, **Signal Processing Track II** convened in Classroom V Block, under the guidance of **Dr.A.Prasanth and Dr.M.Kavitha.**

EVENTS ORGANIZED

- The **Valedictory Session** commenced with the chief guest introduction by **Mrs.S.M. Mehzabeen. Dr.V.Jeyalakshmi, Professor at Anna University, Chennai** delivered the valedictory address and a keynote on **"Significance and Challenges of Artificial Intelligence".**


- As the event drew to a close, participants engaged in a valuable exchange of feedback, reflecting on the insights gained and offering constructive suggestions for future endeavours. The distribution of certificates for prize winners, participants and organisers recognized the dedication and hard work of all involved, acknowledging their contributions to the success of the conference. **Mrs.K.S.Subhashini,** with grace and gratitude, extended a heartfelt v**ote of thanks,** expressing appreciation to the participants, organizers, sponsors, and everyone who played a role in making the event a resounding success.

EVENTS ORGANIZED

- On the Vibrant date of April 16, 2024, SVCE (Sri Venkateswara College of Engineering) hosted its prestigious innovation showcase, SVCE Innovates 24. Under the scrutiny of a distinguished panel of judges comprising **Dr.V.Yokesh and Dr. R. Priyadharshini, Assistant Professors** from the ECE at SVCE, alongside esteemed guests **Dr.M.Vanitha, Professor at Saveetha Engineering College and Dr.P.Sharon Femi, Assistant Professor at SVCE.** The event unfolded with anticipation and excitement. The projects presented by 30 talented teams captivated the judges with their ingenuity and practical applications. SVCE Innovates 24 served as a testament to the unwavering commitment of SVCE to foster innovation and creativity among its students, providing a platform for the bright minds of tomorrow to shine.
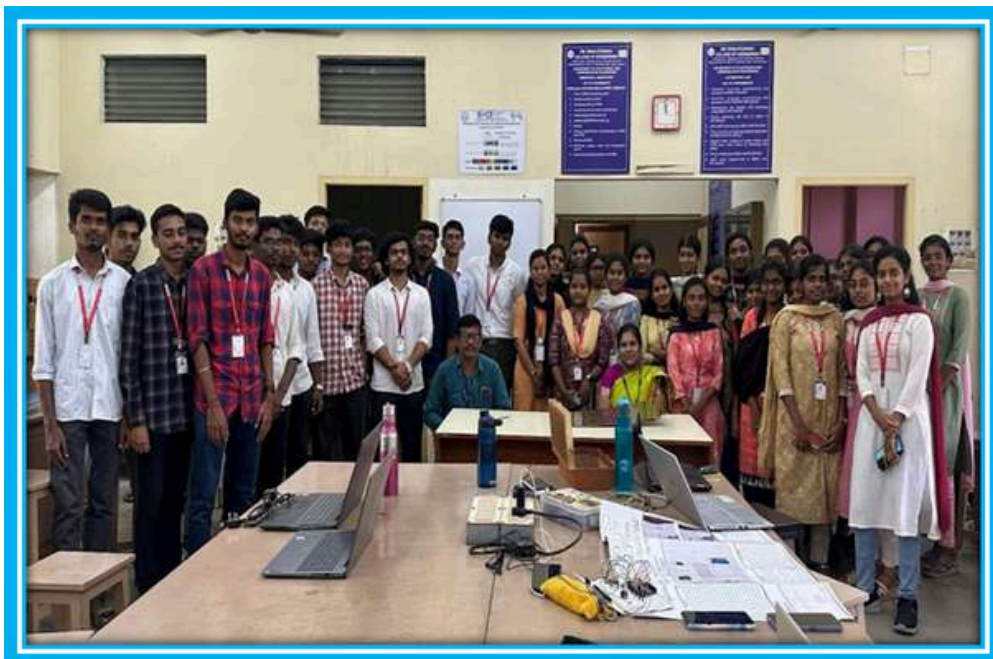
EVENTS ORGANIZED

- The Department of ECE hosted a Guest Lecture **"The Role of Embedded Systems in Assistive Healthcare Technologies"** at the Biotechnology Seminar Hall on 27.04.2024. The event, spearheaded by **Dr.G.A.Sathish Kumar, Head of the Department** aimed to provide students with insights into the intersection of embedded systems and healthcare innovation. The coordination and organization of the lecture were efficiently handled by **Dr. T.J.Jeyaprabha and Mr.S.Elangovan,** who ensured a seamless execution of the event logistics.The guest speaker for the occasion was **Mr. Prashanna Rangan R, a seasoned Senior Mechatronics Engineer from THRYV Mobility.** Mr. Prashanna brought his wealth of expertise to the forefront as he delved into the pivotal role of embedded systems in revolutionizing assistive healthcare technologies. The audience comprised enthusiastic II and III Year students eager to grasp the intricacies of embedded systems in healthcare. Mr. Prashanna's real-life examples and case studies resonated well with the audience, providing tangible illustrations of embedded systems' impact on healthcare innovation.

FACULTY ACHIEVEMENTS

- **Dr.T.J.Jeyaprabha** attended and completed **"Foundation Level Innovation Ambassador (IA) Training Program"** of the Ministry of Education's Innovation Cell and AICTE through the Institution's Innovation Council (IIC) established at our institution. She was nominated as **SVCE Innovation Ambassador by SVCE-IIC.**

- **Dr.D.Menaka** reviewed a book chapter in CRC press, Taylor and Francis titled **"Internet of things enabled Machine Learning for Biomedical applications".**
- **Mrs.R.Kousalya** acted as a **reviewer** in the **10th International Conference on Communication and Signal Processing (ICCSP 2024)** organized by Department of Electronics and Communication Engineering, Adhiparasakthi Engineering College, Melmaruvathur, Tamilnadu, India held from 12.04.2024 to 13.04.2024.
- **Dr.T.J.Jeyaprabha** mentored three teams for SVCE Innovates titled **Voice Automated Wearable Emergency Response System (1st Prize), AR Empower EDU, Mapping Strengths Unveiling Potential** on Students Research Day organized by Sri Venkateswara College of Engineering, Sriperumbudur on 16.04.2024
- **Dr.D.Menaka** mentored a student research work titled **"Sewage Monitoring System"** on Students Research Day organized by Sri Venkateswara College of Engineering, Sriperumbudur on 16.04.2024

FACULTY ACHIEVEMENTS

- **Mr.L.K.Balaji Vignesh** mentored **four teams for SVCE Innovates** on Students Research Day organized by Sri Venkateswara College of Engineering, Sriperumbudur on 16.04.2024

- **Dr.T.J.Jeyaprabha** acted as **reviewer** for **IEEE International Conference on Distributed Computing and Electrical Circuits and Electronics (ICDCECE-2024)** organized by Ballari Institute of Technology and Management, Ballari from 26.04.2024 to 27.04.2024.

- **Mr.L.K.Balaji Vignesh** acted as resource person for one day workshop on **"Digital Image Processing Applications using MATLAB Tool"** organized by Saveetha Engineering College, Chennai held on 28.04.2024

- **Dr.D.Menaka** handled **ISO 21001:2018 awareness programme** for the faculty members of ECE department on 30.04.2024

FACULTY AWARDS

- The Department of Electronics and Communication Engineering of Sri Venkateswara College of Engineering congratulates **Dr.G.A.Sathish Kumar, Professor and Head of Electronics and Communication Engineering** for being awarded the **"Long Service Award"** during the SVCE College Day 2024 for his outstanding contribution to **25 Years at SVCE.**

- The Department of Electronics and Communication Engineering of Sri Venkateswara College of Engineering congratulates **Mr.M.K.Varadarajan, Assistant Professor of Electronics and Communication Engineering** for being awarded the **"Long Service Award"** during the SVCE College Day 2024 for his outstanding contribution to **25 Years at SVCE.**

- The Department of Electronics and Communication Engineering of Sri Venkateswara College of Engineering congratulates **Mrs.K.S.Subhashini, Assistant Professor of Electronics and Communication Engineering** for being awarded the **"Long Service Award"** during the SVCE College Day 2024 for her outstanding contribution to **20 Years at SVCE.**

- The Department of Electronics and Communication Engineering of Sri Venkateswara College of Engineering congratulates **Mrs.K.Srividhya, Assistant Professor of Electronics and Communication Engineering** for being awarded the **"Long Service Award"** during the SVCE College Day 2024 for her outstanding contribution to **20 Years at SVCE.**

- The Department of Electronics and Communication Engineering of Sri Venkateswara College of Engineering congratulates **Mrs.S.M.Mehzabeen, Assistant Professor of Electronics and Communication Engineering** for being awarded the **"Long Service Award"** during the SVCE College Day 2024 for her outstanding contribution to **10 Years at SVCE.**

OTHER ACTIVITIES

- The Board of Studies (BoS) meeting for the academic year 2023-24 was held on 08.04.2024 through offline mode. Dr.G.A.Sathish Kumar, Professor and Head of the Department presented the syllabus of courses under Professional core, Professional elective, Open elective and Value added courses.

- The following external members have attended along with the internal faculty members. University Nominee-**Dr.G.Sumithra, Professor,** Department of Electronics Engineering, Anna University, Chennai - 44, Industry Expert-**Mr.K.Sendil Vel,** CEO, Malar Electronics Anna Nagar West, Chennai - 600 040, Subject Expert-**Dr.P.K.Jawahar, Professor,** ECE, B.S.Abdur Rahman University, Chennai, Meritorious Alumnus-Dr.Arun Janarthanan, Technology Director and Engineering Practices Head, HCL Technologies Ltd., Chennai
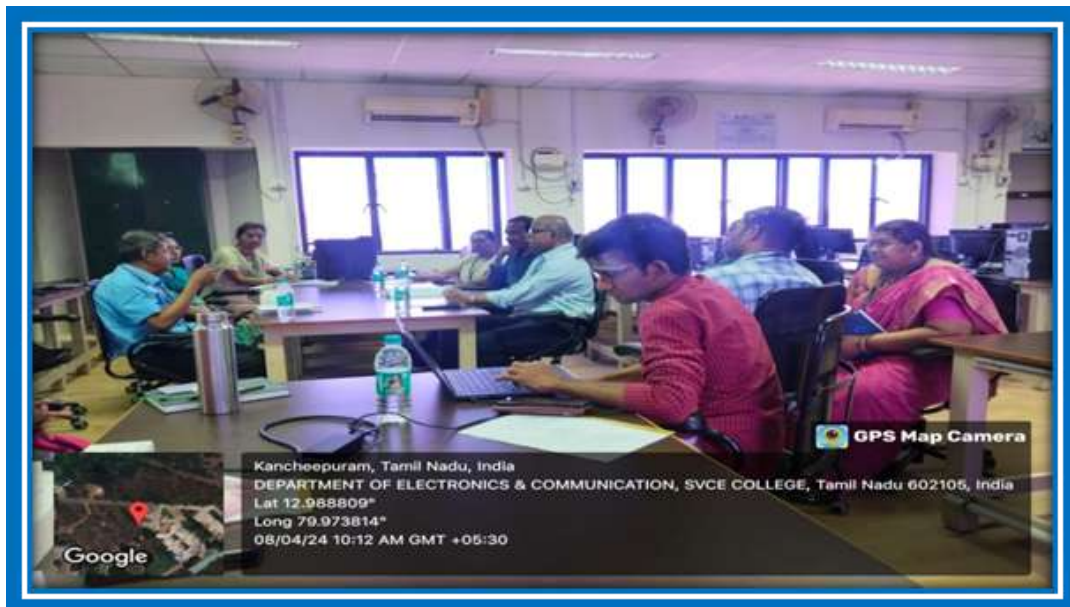
ALUMNI TESTIMONIAL

Mr.Venkatarangan Thirumalai
Founder Catalyst,
Little Feet Services Private Limited, Chennai

"My years at SVCE was a transformative period that instilled in me the confidence and skills necessary to start my own business. SVCE provided me with numerous opportunities to engage in a variety of projects, public debates, and competitions, all of which contributed to my personal and professional growth. One of the most memorable experiences during my time at SVCE was organizing our annual department event, "Panorama", for two consecutive years alongside my classmates. This responsibility entailed reaching out to industry professionals, including CXOs to solicit their support for the event in the form of sponsorships and inviting guest speakers. This exposure to the professional world beyond the confines of our college was invaluable."- **Mr.Venkatarangan Thirumalai, (Batch 1992-1996)**

PROGRAM OUTCOMES

PO1: Engineering Knowledge: Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.

PO2: Problem Analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3: Design / Development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4: Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PROGRAM OUTCOMES

PO5: Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

PO6: The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO7: Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

PO8: Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9: Individual and team work: Function effectively as an individual and as a member or leader in diverse teams, and in multidisciplinary settings.

PROGRAM OUTCOMES

PO10: Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11: Project management and finance: Demonstrate knowledge and understanding of the engineering management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO12: Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and lifelong learning in the broadest context of technological change

PROGRAM EDUCATIONAL OBJECTIVES

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

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.

PROGRAM OFFERED BY THE DEPARTMENT

- **B.E. in Electronics and Communication Engineering**
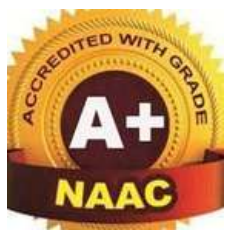- **M.E. in Communication Systems**
- **Ph.D / MS (by Research)**

EDITORIAL BOARD

CHIEF EDITOR

Dr.G.A.Sathish Kumar

Professor & Head

Department of ECE

CO-EDITORS

Mr.L.K.Balaji Vignesh

AP/ECE

Dr.M.Kavitha

AP/ECE

ELECTRONICS AND COMMUNICATION ENGINEERING

ABOUT THE DEPARTMENT

The Department of ECE was started in the year 1985 and is presently accredited by the NBA. The postgraduate program (M.E) in Communication Systems was started in 2002. There are about 38 faculty members in the department and 14 of them are doctorates. The department is well equipped with lab facilities and software tools like IE3D, ADS, CST Studio, Lab View, Tanner Tools, Cadence, MATLAB, and Prototype Machine.

SALIENT FEATURES OF ECE

- The Program has been accredited by the NBA since April 2002.
- Recognized by Anna University, Chennai as an approved research centre for Ph.D. and MS (by Research) with effect from May 2009.
- The major thrust areas of research are RF and Microwave Engineering, Wireless Networks, Network Security, VLSI, Cognitive Radio, Image & Signal Processing, Neural Networks & Soft Computing, Embedded Systems & IoT, Machine Learning, Nano Technology, Robotics, and Artificial Intelligence.
- The department is doing a good number of consultancy work in the field of PCB Prototyping and RF measurements using a Network Analyzer.
- On average over 75 companies visit our department for campus placements External Research grant of Rs 48.26 Lakhs received from ISRO and Cognizant Technology Solutions in the last five years for carrying out various projects.
- Students actively participate in research projects related to Wireless Communications, Networking, Embedded Systems & IoT, Virtual Reality, Robotics, Drones etc.
- Student Counselling Service at SVCE is committed one to promote the mental health and well-being of our students by providing accessible, quality mental health services.
- Student counsellors are available on campus for confidential counselling to all students.
- The department has signed over 12 MOUs with reputed companies to ensure the Industry Institute Interaction.
- Training programs are being conducted to enhance the employability skills of the students and also to achieve good placement in various Industries.

MESSAGE FROM HoD's DESK

The Department of ECE consistently does a commendable job in disseminating the latest knowledge and inviting specialists from diverse domains for discussions on the most recent advancement and trends besides conducting regular classes. We hope every student who visits our department has an engaging, motivating and positive experience. We consistently strive to ensure that instructors and other staff personnel possess the necessary abilities and knowledge to stimulate their students' intellectual curiosity, creativity and critical thinking. I hope you enjoy your time here and thoroughly use our amenities for promising career development

Dr. G.A. SATHISH KUMAR HoD/ECE

VISIT WWW.SVCE.AC.IN

CHOOSING SVCE: A PATHWAY TO SUCCESS AND GROWTH

- One of the prestigious and top ranked Autonomous engineering institution affiliated to Anna University, Chennai.
- Accredited by NAAC and NBA.
- Over 28 % of the alumni work abroad.
- Highest placement offers of Rs.25 LPA and 20 LPA in PayPal and Amazon.
- Highly qualified faculty and staff with an average experience of over 20 years.
- World class Laboratories to foster innovation and research.
- Alumni working in fortune 500 companies like Google, Microsoft, Facebook, Mercedes Benz, INTEL, etc.,
- State-of-the- art-campus with modern amenities in the industrial corridor of Chennai.

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A Bachelor's Degree in Electronics and Communication Engineering with expertise in one of the following specialization

HONOURS SPECIALIZATION

Wireless Communication Systems

VLSI

Antenna and Microwave Technology

Signal Processing and Data Science

IoT Systems and its Applications

Networking and Security

Our Recruiting Companies

Top Universities where our students are pursuing Higher Education

MINORS

Artificial Intelligence and Machine Learning and Machine Learning

Data Science and Analytics

Robotics

Semiconductors

Advanced Communications

Bio-medical Signal Processing

And Many More....

>>> DEPARTMENT OF ELECTRONICS AND COMMMUNICATION ENGINEERING

M.E COMMUNICATION SYSTEMS

ADMISSIONS OPEN FOR THE ACADEMIC YEAR 2024-25

SVCE started the Department of Electronics and Communication Engineering in the year 1985. The Department offers B.E. in Electronics and Communication Engineering and M.E. in Communication Systems. It is also approved as aResearch Centre in Ph.D and MS (by Research) programmes by Anna University, Chennai.

>>> ABOUT SVCE

Sri Venkateswara College of Engineering (Autonomous) is a premier self-financing institution started in the year 1985. The college offers 10 B.E/B.Tech Programmes and 10 M.E/M.Tech Programmes in Engineering and Technology. The Programs are approved by AICTE and the college is affiliated to Anna University, Chennai. The college is also accredited by National Assessment and Accreditation Council (NAAC). Many programs are accredited by National Board of Accreditation (NBA). The college is also certified by ISO 9001:2015. The institution received the autonomous status in the year 2016. Our Vision is to be a leader in Higher Technical Education and Research by providing state-of-the-art facilities to transform the learners into global contributors and achievers.

>>> ADMISSION INFORMATION

A pass in a recognized Bachelor's degree or equivalent in the relevant field and should have obtained atleast 50% in the qualifying degree examination. Admissions are through Tamil Nadu Common Entrance Test (TANCET) conducted by Anna University or GATE

>>> RESEARCH GRANTS

Our faculty members have received major external research grants from prestigious organizations such as ISRO, AICTE, DRDO, and TNSCST, etc., to the tune of ₹56.26 Lakhs in the last three years for doing various funded projects.

>>> SCHOLARSHIPS FOR PG STUDENTS

- Tution fee (Rs. 50,000/year) waiver for 30% of the students of sanctioned class strength on merit basis, as applicable.
- Management Scholarship for tution fees and assistance for books and instruments.
- GATE Scholarship of Rs. 12,400 per month for students having valid GATE Score. Sponsorships for students to attend conferences.
- Intramural M.E/M.Tech Student Research Grant to carry out innovative projects.

>>> RESEARCH AREAS

- Biomedical Instrumentation
- Computer Networks & Network Security
- Digital Signal Processing & Image Processing
- Embedded Systems
- Fiber Optic Communication
- IoT (Internet of Things)
- Nano Electronics
- RF & Microwave Engineering
- Robotics & Artificial Intelligence
- VLSI & Microelectronics
- Wireless Communication Networks

Join the Revolution: Transform Communication Systems with SVCE

>>> MAJOR RECRUITERS

ERICSSON · CSS CORP · TAFE · amazon · TATA COMMUNICATIONS · ZOHO Work. Online · Infosys · Cognizant · WIPRO · accenture · L&T Infotech · HCL