Shri K.V. Shankaragowda
Founder

People's Education Trust (R), Mandya

P.E.S. College of Engineering

(An Autonomous Institution Aided by Government of Karnataka, Affiliated to VTU, Belagavi)

Sri. K S Vijay Anand
President

TECHNOVA

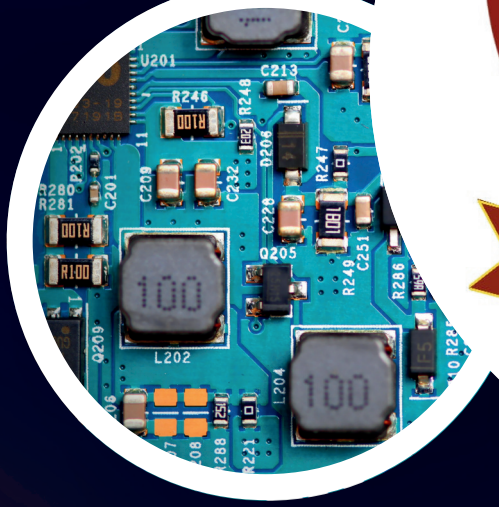
2023-2024

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Estd-1967

PESCE Mandya

CONNECT - COMMUNICATE - INNOVATE



Department of Electronics & Communication Engineering

PESCE CET CODE: E023 | PESCE COMEDK CODE: E089

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About the P. E. S. College of Engineering, Mandya

P. E. S. College of Engineering, Mandya established in 1962 under the aegis of the PET (R) Mandya, is a top notch engineering college in Karnataka with the state-of-the-art equipment, infrastructural facilities and National standard sports facilities. PESCE is a premier technical institutes delivering quality technical education. The Institute was started by a great visionary, Late Sri K V Shankara Gowda, and is now successfully moving ahead under the able leadership of Sri K S Vijay Anand, Chairman, People's Education Trust®, Mandya. The college is making great forays in the arena of technical higher education. It is one of the Pioneer Technical Institutes in the country and has gained a very good reputation by some outstanding achievements of the faculty and students. The institution is functioning under the Grant-in-Aid scheme of Government of Karnataka, permanently affiliated to Visvesvaraya technological University (VTU), Belagavi, become autonomous in the year 2008.

The institute is recognized by All India Council for Technical Education (AICTE), New Delhi and all UG Programs are accredited by National Assessment and Accreditation Council (NAAC), and all the UG programmes are accredited by National Board of Accreditation (NBA), New Delhi. Further, the institution has secured 137 th rank at National-level in the Ministry of Education's National Institutional Ranking Framework (NIRF) – 2022, and the institute has recognised in the band "PERFORMER" under the category "Colleges/Institutes (Govt. and Govt. Aided) (Technical)" in Atal Ranking of Institutions on Innovation Achievement (ARIIA) 2021, a flagship program of the Ministry of Education, Government of India. The institute offers Under Graduate, Post Graduate and Doctoral programs in various engineering disciplines.

OUR PATRONS

Late Shri. K V Shankara Gowda
FOUNDER, Former Education Minister Government of Karnataka

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Principal, P.E.S.C.E, Mandya

Dr. Punith Kumar M B
H.O.D of ECE Department,
P.E.S.C.E, Mandya

VISION

PESCE SHALL BE A LEADING INSTITUTION IMPARTING QUALITY ENGINEERING AND MANAGEMENT EDUCATION DEVELOPING CREATIVE AND SOCIALLY RESPONSIBLE PROFESSIONALS

MISSION

- **PROVIDE STATE OF THE ART INFRASTRUCTURE, MOTIVATE THE FACULTY TO BE PROFICIENT IN THEIR FIELD OF SPECIALIZATION AND ADOPT BEST TEACHING-LEARNING PRACTICES.**
- **IMPART ENGINEERING AND MANAGERIAL SKILLS THROUGH COMPETENT AND COMMITTED FACULTY USING OUTCOME BASED EDUCATIONAL CURRICULUM.**
- **INCULCATE PROFESSIONAL ETHICS, LEADERSHIP QUALITIES AND ENTREPRENEURIAL SKILLS TO MEET THE SOCIETAL NEEDS.**
- **PROMOTE RESEARCH, PRODUCT DEVELOPMENT AND INDUSTRY-INSTITUTION INTERACTION.**

About the Department of Electronics & Communication Engineering

The Department of Electronics and Communication Engineering started the B.E. degree program in 1972, the M.Tech. in 2006, and the Ph.D. and M.Sc. (by research) programs in 2004. Initially, the undergraduate program had an intake of 60 students, which has now expanded to 180 students per year. Department ECE is one of the key departments at the institution, focused on providing high-quality technical education in the field of electronics and communication. Established with a vision to produce competent and skilled engineers, the department offers undergraduate, postgraduate, and research programs. Here's a brief overview of its focus areas and resources: The department comprises highly qualified and experienced teachers, supporting staff, good laboratory facilities, staff rooms with internet, a seminar room, a library, a computer center, and other infrastructural facilities. The location and atmosphere are conducive to learning.

Programs Offered:

Undergraduate Program (B.E.): The department offers a Bachelor of Engineering in Electronics and Communication Engineering, focusing on areas such as communication, signal processing, VLSI design, embedded systems, and image processing.

Postgraduate Program (M.Tech): In 2012, the department introduced a Master of Technology program specializing in VLSI Design and Embedded Systems.

Research Programs: Recognized as a research center by Visvesvaraya Technological University (VTU) and the University of Mysuru, the department offers part-time and full-time Ph.D. programs.

Curriculum and Research: The curriculum is designed to cover a wide array of topics in electronics and communication, such as VLSI, embedded systems, signal processing, communication systems, and IoT. The department emphasizes research-driven education, aiming to make students industry-ready through practical exposure and projects.

Faculty: The department boasts a team of experienced and dedicated faculty members, many of whom hold Ph.D. degrees and have significant research and industry experience. They are involved in cutting-edge research and often publish in reputed journals.

Laboratories and Facilities: ECE at PESCE Mandya is equipped with well-established labs, including VLSI and Embedded System labs, Signal Processing labs, and Communication labs. These facilities provide hands-on experience and support various student and faculty research initiatives.

About the Department of Electronics & Communication Engineering

VLSI Design Laboratory: Established in 2010-12 with funding from the Vision Group on Science and Technology (VGST), Government of Karnataka, this lab conducts regular training programs for students, research scholars, and faculty.
Medical and Image Processing Laboratory: This facility focuses on medical image modalities and processing, including areas like diabetic retinopathy and MRI image segmentation algorithms.
Industry Collaborations and Projects: The department regularly collaborates with industries and R&D organizations, facilitating internships, workshops, and projects that give students real-world experience and prepare them for future careers in technology.
Workshops and Skill Development: The department regularly organizes workshops and hands-on training sessions in collaboration with industry partners.
Student Clubs and Activities: The ECE department encourages participation in technical clubs and student chapters like IEEE and ISTE. Through these platforms, students engage in technical events, hackathons, seminars, and industry visits, enhancing their learning and networking opportunities. Students from the ECE department have demonstrated excellence in various competitions.

The ECE department at PESCE Mandya stands out for its commitment to quality education, research, and practical experience, preparing students for dynamic roles in the electronics and communication sector.

VISION

The department of E & C would endeavour to create a pool of Engineers who would be extremely competent technically, ethically strong also fulfil their obligation in terms of social responsibility.

MISSION

M1: Adopt the best pedagogical methods and provide the best facility, infrastructure and an ambience conducive to imbibe technical knowledge and practicing ethics.
M2: Group and individual exercises to inculcate habit of analytical and strategic thinking to help the students to develop creative thinking and instil team skills.
M3: MoUs and Sponsored projects with industry and R & D organizations for collaborative learning.
M4: Enabling and encouraging students for continuing education and moulding them for life-long learning process.

Program Educational Objectives (PEOs) of the Department

Graduates of the program will be able to

PEO1: Graduates to exhibit knowledge in mathematics, engineering fundamentals applied to Electronics and Communication Engineering for professional achievement in industry, research and academia

PEO2: Graduates to identify, analyse and apply engineering concepts for design of Electronics and Communication Engineering systems and demonstrate multidisciplinary expertise to handle societal needs and meet contemporary requirements

PEO3: Graduates to perform with leadership qualities, team spirit, management skills, attitude and ethics need for successful career, sustained learning and entrepreneurship.

Program Specific Outcomes (PSOs) of the Department

Program Specific Outcomes of bachelor degree (B.E, E&C) program are defined as follows which are in line with the Program specific criteria (PSC) as defined by IEEE.

After the graduation, the student will have:

PSO1: An ability to understand the basic concepts in Electronics & Communication Engineering and to apply them in the design and implementation of Electronics and communication systems.

PSO2: An ability to solve complex problems in Electronics and Communication Engineering, using latest hardware and software tools, along with analytical skills to arrive at appropriate solutions.

Program Outcomes

Engineering Graduates will be able to

PO1 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.

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.

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 and 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 life-long learning in the broadest context of technological change.

Magazine Editorial Members

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Sri.K S Vijay Anand, President, People's Education Trust ®, Mandya.

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Co-Convener :

Dr. Punith Kumar M.B., Professor and Head, Dept. of ECE, PESCE.

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Noor Ayesha, Assistant Professor.
Srinidhi Gowda, Assistant Professor.

Student Members :

Mayur H V

Technova Magazine Editorial Members

MESSAGE FROM HOD

"It is with great pride and enthusiasm that I present the latest edition of our department's technical magazine—Technova. This magazine stands as a testament to the relentless pursuit of knowledge, innovation, and technical excellence by our students and faculty in the field of Electronics and Communication Engineering.

Technova serves as a platform for showcasing cutting-edge projects, insightful technical articles, and emerging trends in Electronics and Communication Engineering. It highlights the relentless efforts of our students and faculty in pushing technological boundaries and contributing to advancements in the field.

At PESCE Mandya, we strive to create a culture of research, creativity, and problem-solving, empowering our students to push the boundaries of technology. This publication showcases groundbreaking projects, insightful technical articles, and the remarkable achievements of our students and faculty.

I extend my heartfelt appreciation to the editorial team, contributors, and everyone involved in bringing this magazine to life. Your dedication and passion for technology continue to inspire and elevate our department. May this magazine serve as a source of knowledge, motivation, and a platform for future innovations.

Happy reading, and let us continue to learn, explore, and innovate!"

Dr. Punith Kumar M B
Head of the Department
Electronics and Communication Engineering
PESCE, Mandya
hodec@pesce.ac.in

Technova Magazine Editorial Members

MESSAGE FROM EDITOR

It gives me immense pleasure to present to you the latest edition of our Department of Electronics and Communication Engineering's Technical Magazine. This publication is a testament to the innovative spirit and relentless pursuit of knowledge exhibited by our faculty and students. The field of Electronics and Communication Engineering is evolving at an unprecedented pace, shaping the future through advancements in artificial intelligence, wireless communication, embedded systems, and more. In this issue, we aim to capture this dynamic growth by showcasing ground breaking ideas, research contributions, and practical insights from our vibrant community. I extend my heartfelt gratitude to all contributors, authors, and the editorial team for their unwavering commitment to excellence. Your efforts have enriched this magazine and inspired curiosity and creativity within our department. I hope this edition serves as a platform to celebrate our collective achievements and as a source of inspiration for aspiring engineers. Let us continue to strive for innovation and work together to contribute meaningfully to the technological advancements of tomorrow.

Warm regards,

Dr. Nanda B S
Professor
Editor
Electronics and Communication Engineering
PES College of Engineering, Mandya

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- Faculty patents/publication/achievements
- Projects(best project)

ARTICLES BY FACULTIES

1.A Ring-Shaped MEMS-Based Piezoresistive Force Sensor for Cardiac Ablation Catheters

Catheter ablation, a minimally invasive surgical procedure that uses radiofrequency (RF), has simplified the treatment process of cardiac arrhythmias. The success of cardiac ablation procedures greatly depends on the effective lesion formation, which relies on the contact force between tissue and the tip. Thus, a real-time estimate of catheter tip contact force is essential during cardiac ablation procedures. We present the design, fabrication, and characterization of a piezoresistive Micro-Electro-Mechanical System (MEMS)-based force sensor for measuring catheter tip contact force in real-time. The sensor has four bridges with boron-doped piezoresistive elements for detecting the contact force.

The sensor dimensions and the piezoresistors doping concentrations were optimized using finite element analysis. The sensor is designed to measure a catheter tip contact force between 0 – 0.8 N. An in-house indentation setup is developed and integrated with a commercial load cell to characterize the fabricated sensor. The sensor results showed a linearity of 99.5 %, maximum hysteresis of 5 %, and sensitivity of 108 ± 11Ω /N. A customized catheter tip integrated with the fabricated force sensor was tested on excised porcine heart tissues to measure the catheter tip contact force.

Spoorthy M R
Assistant Professor
Department of ECE
PESCE, Mandya

2.Artificial Intelligence in the Real World

Artificial Intelligence in the Real World: Transforming Industries and Enhancing Lives
Artificial Intelligence (AI) has transcended its theoretical roots to become a powerful force driving innovation across industries. From healthcare to finance, transportation to customer service, AI applications are transforming the way businesses operate and improving daily life for people around the globe. AI has quickly transitioned from science fiction feed to a transformative force in our everyday lives, revolutionizing industries, economies, and societies worldwide. From personalized recommendations on streaming platforms to autonomous vehicles navigating our streets, AI is universal, making profound impacts across diverse sectors.

In healthcare, AI is a game-changer, improving diagnostics, treatment plans, and patient outcomes. Machine learning analyses vast medical data to predict diseases accurately, while AI-driven robotic surgery aids precision and speeds recovery.

Similarly, in finance, AI algorithms crunch numbers and analyse market trends faster and more accurately than human traders and detect fraud in real-time, mitigate risks, and optimize investment portfolios, enhancing financial decision-making.The fintech revolution AI with chatbots providing customer support and algorithms personalizing financial advice. Education is AI to tailor learning experiences. Intelligent tutoring systems adapt to students learning speeds and styles, offering personalized lesson plans and feedback. Natural language processing facilitates language learning through interactive platforms, while AI-driven analytics help educators track student progress and identify areas needing attention. Transportation is on the brink of a revolution with AI at its core. Self-driving cars promise safer roads and increased mobility for the elderly and disabled. AI optimizes traffic flow reducing congestion and emissions. Drones equipped with AI enable efficient delivery services, from medical supplies in remote areas to packages in urban centres, transforming logistics and supply chains.

AI impacts environmental conservation through satellite imagery analysing deforestation, wildlife tracking, and disaster prediction. Machine learning optimizes energy use in smart grids for sustainable cities. Ethical concerns like data privacy, bias in algorithms, and job displacement accompany AI's rapid integration. Addressing these requires ethical frameworks, regulations, and proactive measures for equitable societal benefits.

In conclusion, artificial intelligence is transforming the world across various sectors, including healthcare, finance, education, transportation, and environmental conservation. While AI enhances efficiency and fosters innovation, its ethical implications and societal impact require thoughtful consideration. Embracing AI's potential and managing its challenges will shape our path to a smarter, interconnected future.

As AI evolves, its integration into our daily lives will continue to accelerate, offering new opportunities and posing new questions. The key lies in harnessing AI's power for the greater good, ensuring that it enhances human capabilities and improves quality of life for all.

Pavithra B.G
Assistant Professor
Department of ECE
PESCE, Mandya

3.Humanoid Robot

HUMANOID ROBOT are robots that resemble and act like humans. Typically engineered to imitate authentic human expressions, interactions and movements, these robots are often outfitted with an array of cameras, sensors and, more recently, AI and machine learning technologies. While more humanoid robots are being introduced into the world and making a positive impact in industries like logistics, manufacturing, healthcare and hospitality, their use is still limited, and development costs are high.

Some Examples of Humanoid Robots are

Some Examples of Humanoid Robots are

- Ameca (Engineered Arts), Alter 3 (Osaka University and mixi)
- ARMAR-6 (Karlsruhe Institute of Technology)
- Apollo (Apptronik)
- Atlas (Boston Dynamics)
- Beomni (Beyond Imagination)
- Digit (Agility Robotics)
- Jiajia (University of Science and Technology of China)
- KIME (Macco Robotics)
- Nadine (Nanyang Technological University)
- NAO (Softbank Robotics)
- OceanOne (Stanford Robotics Lab)
- Pepper (Softbank Robotics)
- Robonaut 2 (NASA and General Motors)
- Sophia (Hanson Robotics)

Sensors can be classified according to the physical process with which they work or according to the type of measurement information that they give as output. Proprioceptive - sensors sense the position, orientation, and speed of the humanoid's body and joints, along with other internal values. Exteroceptive -Arrays of tactels can be used to provide data on what has been touched. The Shadow Hand uses an array of 34 tactels arranged beneath its polyurethane skin on each fingertip. Tactile sensors also provide information about forces and torques transferred between the robot and other objects.
Actuators are the motors responsible for motion in the robot. Humanoid robots are now used as research tools in several scientific areas. Researchers study the human body structure and behavior (biomechanics) to build humanoid robots. On the other side, the attempt to simulate the human body leads to a better understanding of it.

Human cognition is a field of study which is focused on how humans learn from sensory information in order to acquire perceptual and motor skills. This knowledge is used to develop computational models of human behavior, and it has been improving over time.

Chaithra. K
Assistant Professor
Department of ECE
PESCE, Mandya

4.Virtual Reality v/s Augmented Reality: A Brief Comparison

In the rapidly evolving world of technology, Virtual Reality (VR) and Augmented Reality (AR) have emerged as transformative innovations, each offering unique ways to interact with digital content. Although they share some similarities, VR and AR serve distinct purposes and are applied differently across various industries. This article explores the fundamental differences and applications of VR and AR, highlighting their significance in today's tech landscape. Virtual Reality (VR) immerses users in a completely digital environment, isolating them from the physical world. By wearing a VR headset, users are transported to a simulated space where they can interact with 3D objects and scenarios. This technology is particularly impactful in the gaming industry, providing an unparalleled immersive experience. Beyond gaming, VR is extensively used for training and simulation in fields like aviation, medicine, and military, offering a safe environment to practice complex tasks. Additionally, VR is making strides in education by creating engaging virtual classrooms and in healthcare for therapy and rehabilitation.

In contrast, Augmented Reality (AR) overlays digital information onto the real world, enhancing the user's perception of their environment. AR can be experienced through devices like smartphones, tablets, or AR glasses. This technology is highly accessible and versatile, finding applications in retail, navigation, and maintenance. For instance, AR allows customers to visualize products in their home environment before making a purchase or assists technicians by overlaying repair instructions on machinery. In education, AR brings textbooks to life by integrating interactive 3D models and animations.

The primary difference between VR and AR lies in their approach to user engagement.

VR creates a fully immersive experience by replacing the real world with a virtual one, whereas AR enriches the real world with digital elements, allowing users to interact with both simultaneously. This distinction defines their applications and user experiences.

Despite these differences, VR and AR also share common ground, particularly in education and training. Both technologies enhance learning experiences—VR by providing complete immersion and AR by adding interactive digital layers to real-world environments.

In healthcare, VR and AR are used for different purposes, with VR creating controlled therapeutic environments and AR assisting in real-time surgical procedures.

As VR and AR technologies continue to advance, their applications are expected to expand, leading to more integrated and innovative solutions across various sectors.

Whether offering immersive virtual experiences or enhancing reality with digital overlays, VR and AR are reshaping the way we interact with the world, unlocking new possibilities and experiences.

Dimple R
Assistant Professor
Department of ECE
PESCE, Mandya

5.The Power of Internet of Things and Hyperconnectivity!

The Internet of Things (IoT) and hyperconnectivity create a seamless, intelligent network where everyday devices communicate and work together effortlessly. This technology transforms our homes and workplaces, enhancing convenience and efficiency. By connecting everything from appliances to office equipment, IoT revolutionizes modern living and business operations.

Hyperconnectivity refers to the intricate web of connections between digital systems, data, and devices, all interconnected through the internet. This phenomenon is increasingly evident in our daily lives, where we can remotely control various devices, such as TVs, air conditioning, and washing machines, using our mobile devices.

As technology advances, hyperconnectivity is expected to intensify, transforming the way we live, work, and leisure. Breakthroughs in mobile technology, browsers, voice assistants, and the Internet of Things (IoT) are driving this shift. Moreover, cities are becoming increasingly interconnected, giving rise to the concept of smart cities. In Spain, for instance, smart city models are leveraging hyperconnectivity to optimize resource management, such as water conservation and intelligent parking solutions, paving the way for a more efficient and sustainable future.

In the industrial realm, the same technologies that enhance our personal lives are being harnessed to boost productivity and foster a culture of continuous improvement.

Hyperconnectivity is a vital component of the Industry revolution, enabling companies to integrate their processes and systems, both internally and externally. This seamless connectivity empowers production facilities, supply chains, and stakeholders - including customers and suppliers - to interact and collaborate more effectively. Moreover, hyperconnectivity is transforming the way businesses operate, with cloud computing exemplifying a more agile, dynamic, and interconnected work paradigm. However, as we embrace these advancements, it is crucial to ensure the security of our hyperconnected processes through robust cybersecurity measures, safeguarding our information technology and connectivity infrastructure from potential threats.

The widespread adoption of hyperconnectivity in industries and production processes will unlock numerous advantages. Most notably, it will enable a deeper understanding of customer preferences, allowing for the creation of highly personalized products tailored to their specific needs. Hyperconnectivity is a catalyst for competitiveness, driving business success. Some of the key benefits include:

- Seamless integration of the entire product value chain, fostering transparency and building trust among customers, employees, and suppliers.
- Real-time monitoring and analysis of process data, enabling informed decision-making and identifying opportunities for optimization.
- Enhanced situational awareness, allowing for swift detection of changes in supply and demand, and informed decisions on market timing for new product launches.

By harnessing the power of hyperconnectivity, businesses can revolutionize their operations, driving innovation, efficiency, and growth.

IHyperconnectivity takes IoT to the next level by facilitating multiple connection points between humans and machines, enabling real-time data sharing and optimized solutions. Artificial Intelligence (AI) and Machine Learning (ML) further enhance this process by analyzing patterns and improving problem-solving algorithms.

In the home, IoT-enabled devices can be controlled remotely through smartphone apps, making life more convenient. Popular platforms like Amazon Alexa and Apple Home make it easy to set up home IoT systems.

n businesses, IoT and hyperconnectivity can enhance safety, predict service problems, and revolutionize user experiences. Essential strategies for implementation include network communication, consolidated apps, automation, and AI/ML integration.

However, IoT also presents security and privacy challenges, such as vulnerable devices and sensitive data. Implementing intelligent IoT security systems and ensuring data protection through encryption and authentication measures can mitigate these risks.

Yashwanth B
Assistant Processor
Department of ECE
PESCE, Mandya

ARTICLES BY STUDENTS

1.The Role of IoE in Transforming Smart Cities

The Internet of Everything (IoE) is revolutionizing urban development by transforming cities into smarter, more efficient, and citizen-centric environments. Building upon the foundation of the Internet of Things (IoT), IoE integrates people, processes, data, and devices into a unified network, fostering seamless communication and intelligent management across urban infrastructures. In the realm of smart cities, IoE enables real-time monitoring and optimization of critical components such as infrastructure, transportation, public safety, and citizen services. Smart infrastructure powered by IoE facilitates efficient resource management, exemplified by smart grids that optimize energy distribution and IoE-enabled water systems that detect leaks and manage consumption. Intelligent Transportation Systems (ITS) leverage IoE to connect vehicles, traffic sensors, and data analytics, reducing congestion, enhancing road safety, and minimizing environmental impact through innovations like smart parking solutions. Furthermore, IoE significantly bolsters public safety with connected surveillance systems, disaster management frameworks, and environmental sensors that promptly detect hazards such as gas leaks or floods, ensuring rapid emergency response. On the citizen engagement front, IoE integrates public services with digital platforms, offering residents easy access to services through mobile apps, smart kiosks, and interactive tools, which foster participatory decision-making and feedback mechanisms.

IoE's transformative role in smart cities extends beyond immediate technological advancements. It paves the way for sustainable urban ecosystems that prioritize people's needs while reducing operational costs and enhancing overall quality of life. Future advancements in IoE hold immense potential, with emerging technologies like artificial intelligence (AI), edge computing, and 5G connectivity poised to amplify its impact.

AI will enable more intelligent decision-making processes, while edge computing ensures faster data processing closer to devices, reducing latency and bandwidth usage. The rollout of 5G networks will further enhance the connectivity of IoE devices, allowing for greater scalability and efficiency. In addition, the incorporation of blockchain technology could improve data security and transparency in IoE systems, addressing privacy concerns while fostering trust among stakeholders. As more cities embrace IoE, they can look forward to creating adaptive, resilient, and inclusive urban environments that cater to the needs of their growing populations. By leveraging these advancements, the vision of truly smart cities that are sustainable, efficient, and people-centric is rapidly becoming a reality, heralding a transformative era in urban living.

Harshitha C M
4PS21EC041
Department of ECE
PESCE, Mandya

2.LI-FI Technology

The acronym Li-Fi (Light Fidelity) was born at the beginning of the 2010s. Its name derives from the very well-known Wi-Fi (Wireless Fidelity). The term VLC (Visible Light Communication) is used in the restricted instances of visible light. Mr. Luc Chassage who works for Oledcomm and the Versailles University is also Scientific Committee President of the Global Li-Fi Congress that offers 20 lectures dealing with all aspects of Li-Fi. He is a profound expert in this technology field. Mr. Chassage explains the functionality, pitfalls and hurdles to overcome, the disadvantages and advantages, and best practice to apply Li-Fi. Li-Fi relates to wireless communication technologies which rely on light as a power source. Owing to the incredible increase of LEDs (Light Emitting Diodes) over the last few years, which have become reliable and more affordable, Li-Fi technology can be integrated on a daily basis. The LEDs can be used like lasers in optical telecommunication in order to transfer data. LED light sources present in our surroundings can therefore be used for lighting but also used to transfer digital data. Li-Fi technology is very simple from a functional point of view. The majority of applications exchange data in digital form. A transmitter, essentially an LED, sometimes a laser, emits light and information simultaneously. We then find the standard elements of a data chain transmission: data, coding and a network. These digital networks modulate the LED transmitter which then allows the transposition of the electrical signal into a light signal. Then the light signal is freely diffused into a room or outside. Depending on the distance, there is a greater or lesser reduction and according to the various environmental disturbances (rain, sun, other lighting, etc.).

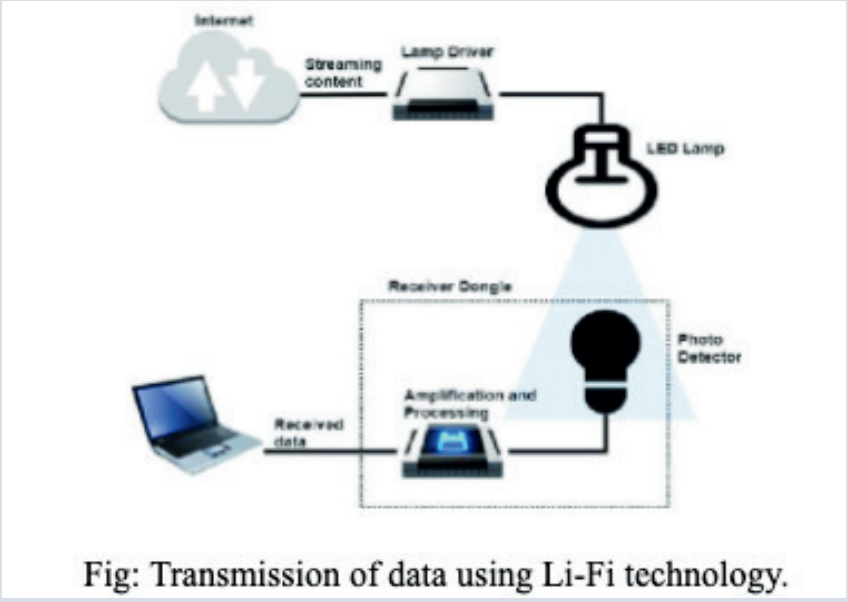


Fig: Transmission of data using Li-Fi technology.

The receiver at the end of the chain is the most important element in order to ensure a good signal. As well as a photo detector, it can be made up of an optical group more or less sophisticated consisting of lenses of ambient light caches and eventually chromatic filters which accentuate colors. The whole system is responsible for gathering the maximum amount of useful optical power. Once the signal has been converted into an electrical signal and is sufficiently pre-amplified, various stages of amplification and filtering allow the reconstruction of digital signal and then it can be decoded in order to obtain the initial data. The reconstruction of digital data can be done according to the methods used in the optic fiber transmission chains or radio frequency transmission chains because we are faced with the same problems. Thus we find amplifiers, analogue filters at the beginning of the chain and digital ones at the end of the chain. An equalizer is responsible for adapting the filtering of the channel in real time. Synchronization at the beginning of the network, a reconstruction of timing and finally a decision making level. The chain described here is unidirectional, which corresponds to the downward track of the emitter towards the user. This one way is sufficient in order to carry out the data transmission, but encounters limits in the case of data to be exchanged. In this case, it is necessary to reproduce the system for the ascending track and to be bidirectional. Current Li-Fi systems use infrared and non-visible ascending tracks, so as to not disturb the downlink and not to impose on each user a visible transmitter element, which apart from anything else would be extremely problematic.

While there are, in practice, still some hurdles to overcome, the lab results are very promising and in some applications the technology has already proven the capabilities. Transmission speed and data reliability are already on a high level. But as for any technology, there are applications where it performs better or poorer. Therefore, it is important to understand: Radiofrequencies and light are not enemies but allies!

Kavya J N
4PS21EC056
Department of ECE
PESCE, Mandya

3.How the India Semiconductor mission is shaping the future of electronics

Modern electronics manufacturing relies on the global semiconductor industry, which was valued at $573 billion in 2022. India, a significant consumer of electronics, imports all its semiconductor chips, leading to a tech and economic gap. To address this, the Indian government launched the India Semiconductor Mission in December 2021 with a budget of ₹76,000 crore ($10 billion). The mission aims to develop domestic semiconductor manufacturing capabilities, reduce import reliance, and position India as a global electronics manufacturing hub by creating a comprehensive ecosystem that includes fabrication and testing facilities. This article explores the India Semiconductor Mission's impact on India's electronics landscape through investments and technological advancements. It outlines the mission's key objectives and their implications for various industries, along with the challenges and solutions in executing this ambitious initiative. India's electronics manufacturing sector has shown impressive growth, nearly doubling from USD 48 billion in FY17 to USD 101 billion in FY23. Despite this, India holds only 4% of the global electronics market share. The ESDM sector is one of the most dynamic in the economy, with projections for the domestic electronics market to hit USD 500 billion by FY30, driven by finished goods and components manufacturing.
Semiconductor manufacturing is crucial for India's technological independence and economic progress, with consumption expected to exceed USD 80 billion by 2026 and reach USD 110 billion by 2030. This demand, coupled with supply chain diversification, positions India to become a key player in the global semiconductor ecosystem.

The India Semiconductor Mission focuses on several objectives, including:

- Developing a comprehensive semiconductor ecosystem through collaboration among government, industry, and academia.
- Supporting local intellectual property and technology transfers.
- Establishing Centres of Excellence for semiconductor research.
- Assisting startups with Electronic Design Automation tools and foundry services.

The mission has already yielded positive results, contributing 20% to the global semiconductor design talent pool. The government has approved several manufacturing facilities, including advanced fabrication plants and assembly units. India's Semiconductor Mission is fostering rapid development of innovative manufacturing infrastructure.The ₹76,000 crore program aims to establish multiple semiconductor facilities. Tata Electronics, in collaboration with Taiwan's Power chip Semiconductor Manufacturing Corp, is building India's first commercial semiconductor fabrication facility in Dholera, Gujarat, with an investment of ₹91,000 crore. Meanwhile, Tower Semiconductor and Adani Group are investing ₹83,947 crore in Panvel, Maharashtra, to produce 40,000 wafers monthly. The proposed India Semiconductor Research Centre (ISRC) will advance R&D in next-generation semiconductors and packaging technologies, partnering with institutions like IIT Bombay and IISc Bengaluru. The mission also supports Assembly, Testing, Marking, and Packaging (ATMP) facilities, including Tata Semiconductor's unit in Assam, which has a ₹27,000 crore investment and a capacity of 48 million units per day. The India Semiconductor Mission is driving significant economic growth through strategic investments and workforce development, projected to create 1 million jobs by 2026.Global investors have shown confidence in India's semiconductor potential, with significant investments from companies like Micron Technology, Tata Electronics, and CG Power. The semiconductor sector will create diverse job opportunities, with projections of 300,000 positions in chip fabrication and 200,000 in ATMP roles. The industry requires upskilling of 500,000 talents annually, addressed by specialized training programs and courses in manufacturing and chip design.India's semiconductor market is expected to grow from ₹221,921 crore to ₹2,294,304 crore by 2032.Despite progress, the India Semiconductor Mission faces challenges, including a significant technical expertise gap, with a projected shortage of 250,000 to 300,000 skilled professionals by 2027. Initiatives like bootcamps and mentoring programs are being implemented to address this gap. The complex supply chain for chip production, involving 500 stages, also presents challenges, including reliance on imported materials and geopolitical risks.Environmental sustainability is another critical issue, as the semiconductor industry contributes to greenhouse gas emissions and requires substantial water resources. The government promotes green manufacturing practices, including advanced recycling methods and renewable energy sources.These developments are expected to create one million jobs by 2026 and prioritize environmentally responsible practices. India aims to capture a substantial share of the global semiconductor market, projected to reach USD 500 billion by FY30. The government's training programs are laying the groundwork for future growth, reducing import dependency and enhancing manufacturing capabilities, solidifying India's role in global semiconductor supply chains.

Navyashree C
5th Semester
Department of ECE
PESCE, Mandya

4. Neurotechnology and Human-Machine Interfaces

Neurotechnology involves devices like brain-computer interfaces that connect the brain to external systems. Human-machine interaction covers technologies enabling seamless communication between people and machines, including these advanced neural interfaces.

Neurotechnology encompasses a range of technologies designed to interface with the nervous system to monitor, modulate, or enhance neural function. This field includes brain-computer interfaces (BCIs), neural implants, and neuroprosthetics, all aimed at creating seamless communication pathways between the human brain and external devices. These advancements have profound implications for medicine, particularly in treating neurological disorders and injuries. For example, BCIs can help patients with severe motor impairments regain control of prosthetic limbs or computer cursors, thus restoring a degree of independence and improving quality of life. Human-machine interaction (HMI) facilitated by neurotechnology extends beyond medical applications into various aspects of daily life and industry. In entertainment and gaming, BCIs can offer immersive experiences by directly translating neural activity into game commands. Similarly, in the workplace, neurotechnology can enhance productivity by enabling hands-free control of computers and machinery. The integration of neural data with artificial intelligence also promises to revolutionize how we interact with technology, making it more intuitive and responsive to our cognitive states. Despite its potential, neurotechnology raises significant ethical and societal concerns. Issues of privacy, security, and the potential for misuse of neural data are paramount. There is a need for robust ethical frameworks and regulations to ensure that neuro technological advancements benefit society while safeguarding individual rights. Moreover, addressing the accessibility and affordability of these technologies will be crucial to prevent exacerbating existing inequalities. As neurotechnology continues to evolve, it will be essential to balance innovation with ethical considerations to harness its full potential responsibly.

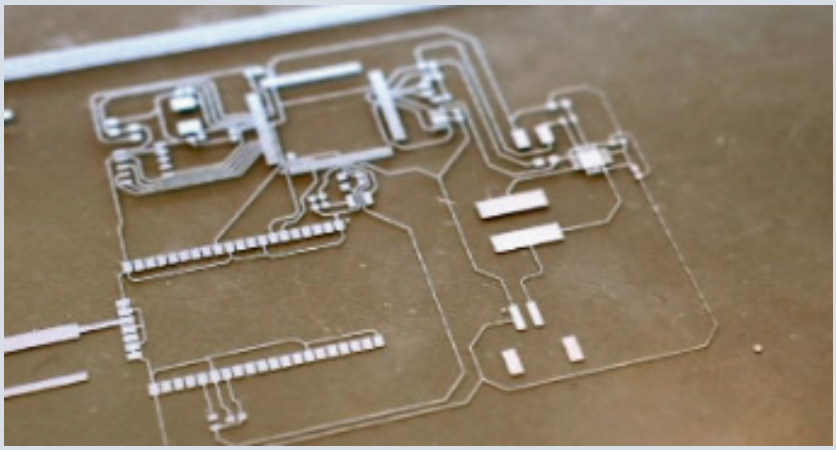
Niranjan N Dalapathi
Department of ECE
PESCE, Mandya

5. Printed Electronics

Printed electronics represent a transformative approach to manufacturing electronic devices by employing printing technologies which is a set of printing methods used to create electrical devices on various substrates to create functional components such as circuits, displays, sensors, and RFID tags. This innovative method utilizes a wide range of materials, including organic conductors, semiconductors, and printable inorganic compounds, enabling cost-effective, flexible, and scalable production. As the technology continues to evolve, it is finding applications in diverse fields, from consumer electronics to healthcare and food packaging.

Materials used in printed electronics, commonly referred to as functional inks, exhibit electrically active properties such as conductivity, semiconductivity, luminescence, electrochromic, or electrophoresis. These materials can be organic or inorganic and are tailored to meet the specific demands of device applications and the manufacturing techniques employed. The print quality, including smoothness, uniformity, and adherence to design accuracy (down to 1 μm), is essential to producing functional devices. Additionally, the interaction between the ink and substrate determines the success of the printing process.Printed electronics initially emerged as a low-cost alternative to traditional silicon-based electronics. Over time, it has evolved into a complementary technology, offering unique advantages that silicon-based systems cannot achieve. The relatively simple and efficient manufacturing processes—characterized by reduced material waste and quicker production—have enabled the development of cost-effective printed electronic components for high-volume market segments where top-tier performance is not critical.

One of the key benefits of printed electronics is the ability to produce ultra-thin, flexible, and lightweight electronic devices. These features allow for applications in wearable devices, foldable gadgets, and conformal electronics, offering versatility across a variety of substrates. The combination of specialized materials with low-cost, large-area fabrication processes such as printing has opened up innovative opportunities in sectors ranging from healthcare to packaging.



Various printing techniques derived from the graphic arts industry are used in printed electronics, each with its strengths and limitations. Flexographic printing produces the thinnest layers, with feature sizes as small as 80 μm and high throughput (3–30 m^2/s), making it suitable for large-scale production. Gravure printing, the fast\
st method, shares similar attributes. Screen printing and inkjet printing, on the other hand, enable higher layer thicknesses (up to 100 μm for screen printing and 20 μm for inkjet printing) but have lower throughput, making them ideal for research, prototyping, or specialized applications. As the field progresses, gravure and flexographic printing show significant potential for mass production, while screen and inkjet printing remain valuable for custom, high-quality designs.

The versatility, scalability, and cost-effectiveness of printed electronics continue to drive innovation, expanding its reach into new industries and applications.

Harshitha N Maiya
4PS21EC045
Department of ECE
PESCE, Mandya

6. Revolutionizing the Future: Unleashing Opportunities in ECE and the Semiconductor Boom

The field of Electronics and Communication Engineering (ECE) is witnessing an unprecedented surge in opportunities, particularly within the booming semiconductor industry. As technology continues to evolve at a breakneck pace, the demand for skilled ECE professionals is on the rise, paving the way for a promising future for students and professionals alike.

The Rise of the Semiconductor Industry

The semiconductor industry is at the heart of modern technology, driving advancements in various sectors such as telecommunications, consumer electronics, and industrial automation. Semiconductors are integral to the functioning of devices from smartphones and computers to medical equipment and autonomous vehicles. As a result, the industry is experiencing rapid growth and is projected to require a substantial influx of skilled professionals by 2027. Industry reports highlighting a looming skills gap, emphasizing the urgent need for talent to sustain this growth and foster innovation.

Opportunities in ECE

The burgeoning semiconductor sector presents a myriad of career opportunities for ECE graduates. Roles in VLSI (Very-Large-Scale Integration) design, embedded systems, and digital signal processing are in high demand. Moreover, emerging fields such as IoT (Internet of Things), AI (Artificial Intelligence), and robotics offer exciting prospects for ECE professionals to lead the next wave of technological breakthroughs.

The Impact of AI on Job Markets

Artificial Intelligence (AI) is transforming industries worldwide, including the IT sector. While AI automates routine tasks and can lead to job displacement in certain IT roles, it simultaneously creates new opportunities within the ECE domain. AI technologies require sophisticated hardware and optimized systems for efficient operation, driving the need for expertise in ECE fields such as AI chip design, sensor technology, and embedded systems.

Essential Skills for Success

To thrive in this dynamic landscape, ECE students should focus on acquiring a comprehensive set of technical and soft skills. Key technical competencies include digital and analog circuit design, microprocessors, and embedded systems. Proficiency in programming languages like Python, C, C++, and VHDL/Verilog is also crucial. Additionally, familiarity with tools such as MATLAB, Simulink, and CAD software for circuit design can enhance employability.

The IT Sector Attraction

Despite the wealth of opportunities in ECE, many students from hardware branches are drawn to the IT sector due to stable employment, lucrative salaries, and numerous job openings. However, given the rapid expansion and innovation within the semiconductor industry and the rise of AI, students should consider the compelling prospects within ECE. The potential for growth, impact, and innovation in this field is immense, offering a fulfilling and dynamic career path.

Conclusion

The field of ECE, particularly within the growing semiconductor industry, offers vast and expanding opportunities. With the sector facing a critical need for skilled professionals, now is the perfect time for students to equip themselves with the necessary skills and seize these opportunities. While the IT sector remains attractive, the potential for innovation and impact within ECE is unparalleled, promising a rewarding and impactful career.

Sinchana S (Satish)
4PS23EC139
Department of ECE
PESCE, Mandya

7. The Future of Autonomous Underwater Vehicles

As technology continues to advance, Autonomous Underwater Vehicles (AUVs) are gaining prominence in various fields, including marine exploration, oceanography, and environmental monitoring. This article examines the future of AUVs from the perspective of Electronics and

Communication Engineering (ECE). It explores the emerging technologies, challenges, and opportunities that ECE professionals will face as they contribute to the development and refinement of AUV systems. By addressing the integration of innovative hardware and sophisticated software solutions, this article emphasizes the critical role that ECE will play in shaping the future of underwater exploration.

Autonomous Underwater Vehicles represent a transformative force in underwater exploration, capable of conducting research, collecting data, and performing tasks without direct human intervention.

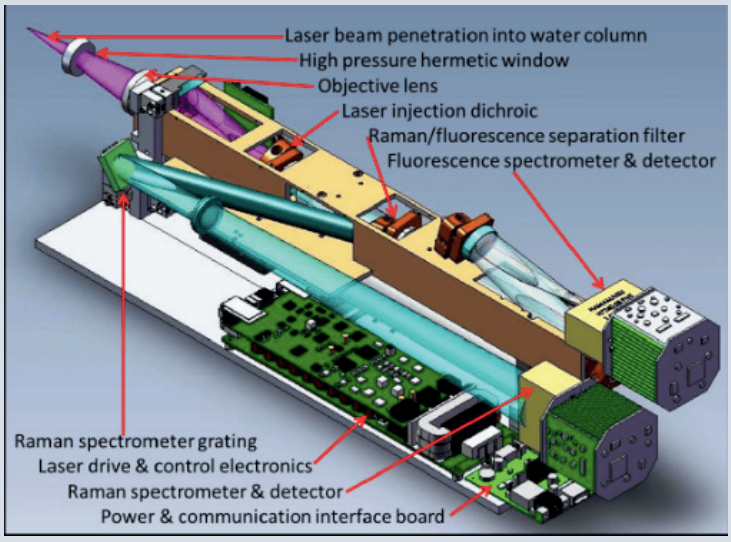
As the demands for efficient and effective underwater operations grow, AUVs have become increasingly essential in various applications, from scientific research to military operations.The future of AUVs is poised for robust growth, and professionals in Electronics and Communication Engineering are instrumental in driving this advancement. The intersection of robotics, software development, sensor technology, and communication systems is where ECE will thrive, creating a demand for innovations that are reliable, efficient, and sustainable.

The Role of ECE in AUV Development

Electronics and Communication Engineering plays a critical role in the development of AUVs, particularly in several key areas:

1. Sensor Technology

One of the most vital components of AUVs is their sensor technology. ECE professionals are tasked with designing and integrating various sensors that enable AUVs to navigate and perform tasks underwater accurately. From sonar systems for mapping the ocean floor to environmental sensors for monitoring underwater ecosystems, the development and integration of these sensors are central to the functionality of AUVs. Future advancements may include more sophisticated multi-sensor systems that combine different types of data for real-time decision-making. Additionally, sensor miniaturization and increased power efficiency will enhance AUV performance and reduce the power consumption which help for longer missions.



2. Communication Systems

AUVs operate in challenging underwater environments where traditional communication systems may falter. Electronics and Communication Engineers are exploring new methods of underwater communication that could enhance data transmission between AUVs and surface vessels.

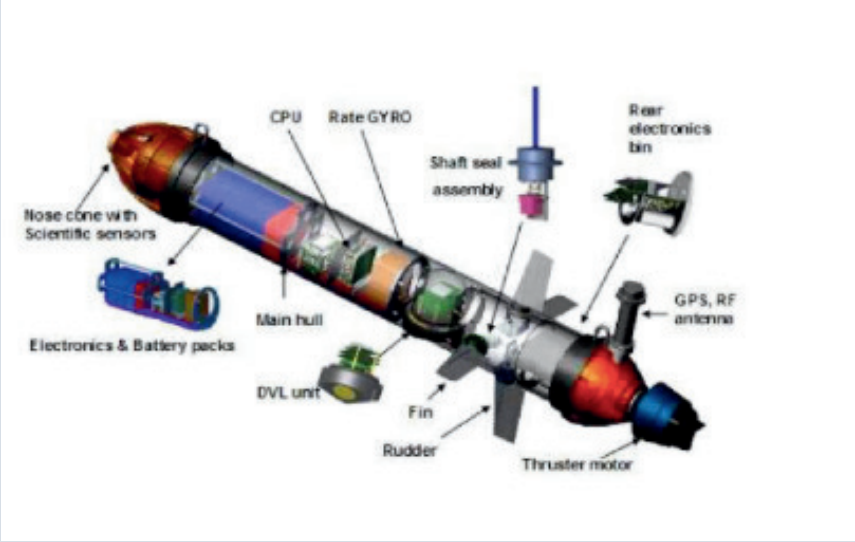
Innovations in acoustic communication, optical systems, and even emerging techniques like underwater networking protocols will drive improvements in operational efficiency and data exchange. The development of hybrid communication systems that combine acoustic and optical technologies could further enhance data transfer rates and reliability in complex underwater environments.

3. Autonomy and Navigation

The success of AUVs hinges on their ability to operate autonomously. Developing advanced algorithms for navigation, path planning, and decision-making is a primary responsibility of ECE professionals. Machine learning and artificial intelligence are increasingly being integrated into AUV designs, enabling vehicles to learn from their environments, optimize their maneuvers, and improve operational performance over time. Enhanced autonomy will allow AUVs to undertake more complex missions with minimal human intervention, increasing their efficiency and effectiveness in various applications.

4. Power Management

Energy efficiency is crucial for AUV functionality, especially during long missions. ECE is at the forefront of developing innovative power management systems that extend the operational life of AUVs. This includes advancements in batteries, energy harvesting technologies, and efficient power distribution systems that ensure reliable performance during extended underwater missions. Research into alternative power sources, such as fuel cells and renewable energy systems, could further extend the operational capabilities of AUVs and reduce their environmental impact.



Challenges Ahead

Despite the promising future of AUVs, several challenges remain. The harsh underwater environment presents the risk of equipment failure, while the need for regulatory compliance and ethical considerations in deployment adds complexity to AUV development. ECE professionals will need to address issues related to environmental impact, data privacy, and mission safety as they continue to innovate. Developing robust and resilient systems that can withstand the pressures and corrosive nature of the underwater environment will be critical. Additionally, ensuring the security of data transmission and preventing cyber threats will be a growing concern as AUVs become more integrated into global networks.

Conclusion

The future of Autonomous Underwater Vehicles is bright, with immense potential for growth and application across various industries. Electronics and Communication Engineering professionals are poised to lead this transformation by advancing sensor technology, communication systems, autonomy, and power management. As society increasingly relies on AUVs for exploration and data collection, ECE will play a vital role in shaping the future of underwater exploration.

Moreover, the advancements in AUV technology will not only benefit scientific research and marine operations but also have far-reaching implications for environmental conservation, security, and resource management. The ability to monitor and protect marine ecosystems, conduct deep-sea exploration, and secure underwater infrastructure will be greatly enhanced by the innovations in AUV technology driven by ECE professionals.

The collaboration between academia, industry, and government bodies will be crucial in overcoming the challenges and pushing the boundaries of what AUVs can achieve. Interdisciplinary research and partnerships will foster the development of more sophisticated, reliable, and efficient AUV systems, opening new avenues for exploration and discovery.

In conclusion, the future of AUVs is an exciting frontier where Electronics and Communication Engineering will play a central role. By embracing the challenges and seizing the opportunities, ECE professionals will drive innovation, contributing to a more informed, secure, and connected world.

The advancements in AUV technology will pave the way for a deeper understanding of our oceans, ensuring sustainable use of marine resources and enhancing our ability to respond to environmental and security challenges. The journey ahead is filled with promise and potential, and the contributions of ECE will be instrumental in navigating this uncharted territory.

Nithin A C
4PS22EC104
Dept. Of ECE
PESCE Mandya

8. The growing trend of Embedded Systems:

Revolutionizing the Modern World Embedded system have become a cornerstone of modern technology seamlessly integrating into our daily lives. These specialized computing system, designed to perform dedicated function within a larger system, are at the heart of the many devices from smartphones to industrial machinery. Their rapid evolution and increased adoption across industries have them a trending technology today.The role of embedded system in business world has massively expanded in the today's world and with good reason. The range of application that can be served, thanks to integration with the like of Internet of Things (IoT), and Industrial Internet of Things (IIoT), has grown and has enabled new levels of smart technology and interconnected ecosystem. It's no surprise therefore that the global market value for embedded system set to reach more than $173 billion by 2032, according to Market.us. As innovative embedded system solution get smarter and more capable, the management and integration responsibilities around them will get more complex. At the same time, there will be also be a need to keep pace with the latest technologies and improvement in embedded system application.

Why embedded systems are trending?

The embedded systems are trending because of the following,

IoT expansion: The IoT has driven the widespread adoption of the embedded system. Devices like smartphones, wearable tech, and connected vehicles rely heavily on embedded system gor real-time processing and communication. The ability to integrate sensors and actuators has made embedded systems indispensable in IoT.

Adoption in AI and ML: Embedded system are increasingly being integrated with AI algorithms enabling devices to perform complex tasks such as image recognition, natural language processing and predictive analytics. Application like autonomous vehicles and smart robotics heavily depend on this synergy.

In feature, the embedded systems market is projected to grow exponentially, driven by innovation in AI, IoT, and advanced hardware. Industries like automotive, consumer electronics, and defense are expected witness significant transformation with integration of embedded systems technologies.

As these embedded system continue to evolve, they will shape the feature of connectivity, automation, and intelligent system.

Akash B C
Dept. Of ECE
PESCE Mandya

TECH ACHIEVMENTS

SCOPUS JOURNALS 02

25 INTERNATIONAL JOURNALS

INTERNATIONAL CONFERENCE 01

01 BOOKS CHAPTERS PUBLISHED

INTERNATIONAL CONFERENCE 01

03 BEST PROJECTS

RESEARCH AND PUBLICATIONS BY FACULTY

List of Papers through Scopus Journals 2023-2024

Sl. No	Year	Title of the paper	Source Name
1	2023-2024	Energy management of a dual battery energy storage system for electric vehicular application	A.S. Mahesh Kumar g , M. Abdullah-Al-Wadud h, Computers and Electrical EngineeringVolume 115, April 2024, https://doi.org/10.1016/j.compeleceng.2024.109099
2	2023-2024	Short-Term Wind Speed and Power Forecasting for Smart City Power Grid with a Hybrid Machine Learning Framework	Wang, Z., Wang, L., Revanesh, M., Huang, C., Luo, X. EEE Internet of Things Journal , 2023, 10(21), pp. 18754–18765, doi: 10.1109/JIOT.2023.3286568.

INTERNATIONAL JOURNALS 2023 – 2024

Sl. No	Author Name	Title of the paper	Journal Name/Volume/Year
1	Dr. Mahesh	VLSI implementation of bio-inspired elementary motion detector	International Journal of Innovative research in science, engineering and technology (IJIRSET), Volume 13, Issue 5, May 2024, DOI:10.15680/IJIRSET.2024.1305482
2	Vinay kumar H S	Smart shopping trolley with automated billing using arduino	International Journal of Innovative research in science, engineering and technology (IJIRSET), Volume 13, Issue 5, May 2024, DOI:10.15680/IJIRSET.2024.1305443
		Face recognition based metro pass authentication	International Journal of Innovative research in science, engineering and technology (IJIRSET), Volume 13, Issue 5, May 2024, DOI:10.15680/IJIRSET.2024.1305467
3	Santhosh babu K C	Design and Implementation Of 32-bit Vedic Multiplier	International Journal of Trendy Research in Engineering and Technology Volume 8 Proceedings of NCCDS-24
4	Nischitha K	Aquatic remote operator	MDPI , Algorithms, https://doi.org/10.3390/a17090399

5	Dr. Punith Kumar M B	Smart Comprehensive monitoring for Alzheimer's patients	International Advanced Research Journal in Science, Engineering and Technology, Vol. 11, Issue 5, May 2024 DOI: 10.17148/IARJSET.2024.11549
		Smart Solutions for Alzheimer's: Enhancing Patient Care with Embedded Systems and IoT Connectivity	International Advanced Research Journal in Science, Engineering and Technology (IARJSET)Vol. 11, Issue 5, May 2024, ISSN (O) 2393-8021, pp. 330-339.
		Real time machine learning based pest detection and pesticides sprayer with IoT based security	International Journal Trendy Research in Engineering and Technology, Volume 8 Proceedings of NCCDS-24, ISSN NO 2582-0958.
		Advanced Crop Protection: Machine Learningfor Pest Detection and IoT Security	International Advanced Research Journal in Science, Engineering and Technology, Vol. 11, Issue 4, April 2024,DOI:10.17148/IARJSET.2024.11473
		Smart Pest Detection and Pesticide Sprayer withMachine Learning and IoT Enhanced Security	International Advanced Research Journal in Science, Engineering and Technology.DOI: 10.17148/IARJSET.2024.11561
		Revolutionizing Alzheimer's Care: Integrating Embedded Systems And Iot For Enhanced Patient Monitoring And Engagement	International Journal Trendy Research in Engineering and Technology (IJTRET) Volume 8 Proceedings of NCCDS-24, ISSN (O) 2582-0958, pp. 79-85.

6	Kumar N Krishna Murthy	Household energy monitoring system	International Journal of Innovative research in science, engineering and technology (IJIRSET), Volume 13, Issue 5, May 2024
		IoT based smart shoe for a visually impaired people	International Journal Trendy Research in Engineering and Technology, Volume 8 Proceedings of NCCDS-24, ISSN NO 2582-0958.
7	Spoorthi M R	Digital E-commerce community website using SAP hybris	International Journal of Innovative research in science, engineering and technology (IJIRSET), Volume 13, Issue 5, May 2024
8	Yashwanth B	IOT Based Smart Weighing System	International Advanced Research Journal in Science, Engineering and Technology, Vol. 11, Issue 5, May 2024, DOI:10.17148/IARJSET.2024.11522
9	Niveditha V K	Indoor navigation system using radio wave RTT triangulation algorithm	International Advanced Research Journal in Science, Engineering and Technology, Volume 11, Issue 5, May 2024DOI: 10.17148/IARJSET.2024.11587

10	Chaithra K	IRIS control robot	International Journal Of Multidisciplinary Research In Science, Engineering and Technology (IJMRSET), Volume 7, Issue 5, May 2024, DOI:10.15680/IJMRSET.2024.0705129
11	Ashraya A N	Indigenous automatic shuttling metro train between stations	International Journal of innovative research in science, engineering and technology(IJIRSET) Volume 13, Issue 5 May 2024
12	Janardhan S Y	Wireless charging for moving electric vehicle	International Journal of Innovative research in science, engineering and technology (IJIRSET), Volume 13, Issue 5, May 2024, DOI:10.15680/IJIRSET.2024.1305463
13	Minugu B	Fault prediction in fan using machine learning	International Journal of Innovative research in computer and communication Engineering (IJIRCCE), Vol. 12, Issue 5, April 2024, DOI: 10.15680/IJIRCCE.2024.1205284
14	Anisha A	Aqua robot	International Journal of innovative research in science, engineering and technology(IJIRSET) Volume 13, Issue 5 May 2024

15	Kavyashree J	The power of proximity device to device computing	International Advanced Research Journal in Science, Engineering and Technology.
16	Dr. Revanesh M	CAN based vehicle monitoring system	International Advanced Research Journal in Science, Engineering and Technology Peer-reviewed, Impact Factor 8.066 & Vol. 11, Issue 5, May 2024,Refereed journal DOI: 10.17148/IARJSET.2024.11569
17	Dr. Sahana Raj B S	Advancing safety standards with real time embedded smart jacket	International Advanced Research Journal in Science, Engineering and Technology, Vol. 11, Issue 5, April 2024, DOI: 10.17148/IARJSET.2024.11565.
		Blind assist system using AI and image processing	International Advanced Research Journal in Science, Engineering and Technology Peer-reviewed, Impact Factor 8.066 & Vol. 11, Issue 5, May 2024,Refereed journal DOI: 10.17148/IARJSET.2024.11568
18	Dr. R Manjunath	Hand gesture recognition for specially abled	International Journal of Innovative Research in Computer and Communication Engineering Volume 12, Issue 7, July 2024,DOI: 10.15680/IJIRCCE.2024.1207016
		Chaotic Code Division Multiple Access	International Journal of Scientific Research in Engineering and Management (IJSREM)
		Ambient intelligent framework for modelling critical medicalevents based on context awareness	International Journal of Electrical and Computer Engineering (IJECE) Vol. 14, No. 3, June 2024, pp. 3106~3115 ISSN: 2088-8708, DOI: 10.11591/ijece.v14i3.pp3106-3115

19	Vidyashree B P	Microwave based wall scanner for terrorist hideout detection with Wi-Fi controlled robot	International Journal of Innovative research in science, engineering and technology (IJIRSET), Volume 13, Issue 5, May 2024
20	M subramanyam	Activities recognition prediction and anomaly detection using deep neural network	International Journal of innovative research in science, engineering and technology(IJIRSET) Volume 11, Issue 7 May 2024
		Human activity detection for surveillance	International Journal of Innovative research in science, engineering and technology (IJIRSET), Volume 13, Issue 5, May 2024,DOI:10.15680/IJIRSET.2024.1305486
		Ambient intelligent framework for modelling critical medical events based on context awareness	International Journal of Electrical and Computer Engineering (IJECE) Vol. 14, No. 3, June 2024, pp. 3106~3115 ISSN: 20888708,DOI:10.11591/ijece.v14i3.pp3106-3115
		Modelling and Performance Analysis of Activity Based Context Aware System	International Advanced Research Journal in Science, Engineering and Technology, Vol. 11, Issue 5, May 2024, DOI:10.17148/IARJSET.2024.11522

21	Dr. Radhika M N	Wireless Auto-Dimming for sustainable driving	International Journal of Innovative research in computer and communication Engineering (IJIRCCE), Vol. 12, Issue 5, April 2024, DOI:10.15680/IJIRCCE.2024.1205284.
		IMM Filtering Algorithms for a Highly Maneuverin g FighterAircra ft: An Overview	Algorithms 2024, 17, 399. https://doi.org/10.3390/a17090399
23	Sushma M P	AI based fruit sorting robot based on ripeness using raspberry pi	International Advanced Research Journal in Science, Engineering and Technology, A monthly Peer-reviewed / refereed journal
24	Shwetha S K	Vehicle to vehicle communicati on using Wi-Fi technology	International Research Journal of Modernization in Engineering Technology and Science
25	Noor Ayesha	Forest fire detection, monitoring and prediction	International Journal of Innovative research in science, engineering and technology (IJIRSET), Volume 13, Issue 5, May 2024,

INTERNATIONAL CONFERENCE 2023 – 2024

Sl. No.	Author Name	Title of the paper	Conference Name/Volume/Year
1	M Subramanyam	Human activity detection for surveillance	15th International Conferences on recent engineering & technology
		Modelling and Performance Analysis of Activity Based Context Aware System	15th International Conferences on recent engineering & technology

BOOKS CHAPTERS PUBLISHED

Sl. No	Name of the Author	Title of the Book	Publisher and year of publication	Role	Year
1	Dr. Sahana Raj B S Dr. V Sridhar	Secure Storage and Retrieval of Medical Records using Crypto Systems	LAP LAMBERTAcademic Publishing, 2023	Author	2023

PH. D AWARDED IN THE YEARS 2023- 2024

Sl. No	Candidate	Ph.D/ M.Sc Engg	University	Date of Award	Guide	Title
1	Mahesh Kumar A S	Ph.D	JSS	24th Feb 2024	Dr. Mallikarjunswamy M S	Study of clinically significant features of Rheumatoid Arthritis (RA) using the radiographic images & IR Thermograms
2	Mukul Manohar S	Ph.D	VTU	07th March 2024	Dr. K N Muralidhara	Video Processing And Target Tracking
3	Bharath M R	Ph.D	VTU	07th March 2024	Dr. K A Radhakrishna Rao	Multimodal biometric fusion for improved speed security and recognition

BEST PROJECTS

Prize	Project title	Student USN	Name of the students	Name of the project guide
1st	IoT based paralysis patient health care system	4PS20EC097 4PS20EC088 4PS20EC095 4PS20EC094	RajugoudaMaranabasari PrashantVaddodagi PurushottamBabulalKhatri Purushottam M J	Dr. B S Nanda
2nd	32-bit ALU design using Vedic mathematics	4PS20EC045 4PS20EC046 4PS20EC053 4PS20EC054	Impana C SImpana DKeerthi Shankar M SKrupa Y T	Santhosh babu K C
3rd	Advancing safety standards with real time embedded smart jacket	4PS20EC075 4PS20EC154 4PS20EC005 4PS20EC156	Nayana RDhanraj B MAbhishek Gowda B MYeshwanth D S	Dr. Sahana Raj B S

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