SWAMI VIVEKANANDA UNIVERSITY

ELECTRONICS AND COMMUNICATION ENGINEERING

July, 2025

Students Achievements

Celebrating the accomplishments of our brilliant students in academics, research, innovation, and competitions.

Project Submission and Presentation

Final year UG and PG students successfully submitted major projects on topics like VLSI, wireless communication, and AI-based systems. The third year students completed mini projects in areas such as IoT-based traffic control, FPGA designs, gesture recognition, and smart agriculture, showcasing practical skills and innovation.

Cadence Based Training

Students underwent Cadence-based training, gaining hands-on experience in semi-custom and full-custom IC design techniques, including schematic entry, layout design, and verification—equipping them with industry-relevant VLSI design skills.

VLSID

Students actively participated in the 5-day VLSID 2024 Conference, gaining valuable exposure to cutting-edge research, industry trends, and expert insights in VLSI design and semiconductor technology.

PCB Design Workshop

As part of their technical skill development, students participated in a 1-week PCB Design Workshop organized by the Department of ECE, where they gained hands-on experience with Cadence tools for schematic design, layout, and PCB fabrication—strengthening their understanding of real-world circuit implementation.

Workshop organized by Ardent

Students attended a 40-hour PCB Design Workshop conducted by Ardent Computech, where they received comprehensive training on KiCad, covering schematic design, PCB layout, and simulation—boosting their hands-on proficiency in open-source PCB design tools.

Skill Development Classes

Students took part in skill development classes throughout the semester focused on emerging technologies like IoT, Xilinx FPGA design, Cadence IC design, and PCB development, enhancing their technical proficiency and preparing them for industry-ready roles in core electronics and embedded systems.

Workshop organized by IEEE

Some 3rd year students actively participated in an IEEE workshop on "Application of IoT in Smart Environment", gaining insights into how IoT technologies are shaping sustainable, intelligent systems and expanding their knowledge through expert-led sessions and practical exposure.

NPTEL

As part of their academic and skill enhancement, students enrolled in certified courses on Analog Electronics, Digital Electronics, and Industrial Automation, successfully completing the required exams and earning certifications—demonstrating their commitment to continuous learning and technical excellence.

Industrial Visit

ECE students participated in an industrial visit to semiconductor industries, where they gained firsthand exposure to chip fabrication processes, cleanroom protocols, and modern manufacturing techniques, enriching their understanding of real-world semiconductor technology.

Faculty Achievements

A glimpse into the accolades, research breakthroughs, and academic pursuits of our distinguished faculty members.

Departmental Journal

Our faculty members has successfully published two volumes of its research journal, Journal of Innovation and Advancement in Electronic Frontier under the department of Electronics and Communication Engineering. This faculty-led initiative reflects our ongoing commitment to academic excellence and innovation in the field of electronics and communication.

Publications

Our faculty members have collectively contributed to nearly 50 publications, including papers in reputed IEEE conferences and journals, patents, and book chapters. Research areas span FPGA, AI/ML, IoT, and more, with chapters published in renowned titles under Taylor and Francis, as well as Advances in Computational Solutions, Scientific Frontiers: Sustainable Practices and Technologies, and Computational Techniques in Modern Engineering Research.

NPTEL

Several faculty members of the ECE department have successfully completed NPTEL certification courses in areas like AI, IoT, Electronics, Python, and VLSI, earning Gold Certificates through outstanding performance in the national-level examinations—demonstrating a commitment to continuous learning and academic excellence.

FDP

Faculty members have actively participated in Faculty Development Programs (FDPs) on emerging topics such as IoT, Embedded Systems, and Advanced Electronics, staying updated with the latest technological trends and pedagogical practices to enhance teaching and research capabilities.

Projects

Faculty members of the ECE department have submitted impactful research proposals addressing real-world challenges. Projects like "IoMT-Powered Health Monitoring for Rural Bengal" and "Application of Artificial Intelligence Methods in Identifying Critical Genes in Breast Cancer" were submitted as seed projects to SVU, focusing on healthcare innovation through technology. Additionally, the project "Comprehensive Strategies for Early Identification and Prevention of Cardio-Metabolic Health Risks" was submitted to the Department of Biotechnology (DBT), reflecting the department's commitment to interdisciplinary research and societal impact.

Departmental Books

Faculty members of the ECE department have authored two books, showcasing their academic expertise and contributions to the field. The first, "New Developments in Electronics", explores emerging technologies and innovations, while the second, "Sustainable Development in Electronic Science and Technology", focuses on eco-friendly advancements and sustainable practices in electronics.

Technical Article

OBSTACLE DETECTOR AND SPEED CONTROL SMART VEHICLE WITH ESP32

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Smart transportation is rapidly evolving with technologies that make vehicles more intelligent, responsive, and safe. One of the important developments in this field is the integration of obstacle detection and automatic speed control systems. These technologies help vehicles respond dynamically to their environment, minimizing collisions and improving navigation. Using the ESP32 microcontroller, a low-cost but powerful device, it's possible to build a compact smart vehicle that can detect obstacles and adjust its speed accordingly.

The project revolves around detecting objects in the path of a moving vehicle and adjusting its speed or stopping it to avoid collisions. An ultrasonic sensor is used to measure the distance between the vehicle and any obstacle ahead. The ESP32 reads the data from the sensor and makes decisions about whether the vehicle should move, slow down, or stop. The motor speed is controlled using a motor driver module, which receives commands from the ESP32. The system can be powered using a lithium-ion battery, making it portable and suitable for mobile platforms. The ultrasonic sensor, usually mounted at the front of the vehicle, emits high-frequency sound waves. When these waves hit an object, they bounce back, and the sensor detects the echo. The time taken for the echo to return is used to calculate the distance. This data is then sent to the ESP32, which uses simple logic to determine the vehicle's response. If the object is too close, the ESP32 can reduce the speed of the motor using pulse-width modulation or stop the vehicle altogether.

The ESP32 is well suited for this application not only because of its processing power and low power consumption but also because it includes built-in Wi-Fi and Bluetooth capabilities. This opens up possibilities for remote monitoring, mobile app integration, or sending real-time alerts when obstacles are detected. These features make the vehicle more adaptable and scalable for advanced use cases. The entire system can be programmed using the Arduino IDE, making it accessible for students, hobbyists, and developers. A simple code structure continuously checks the distance from the ultrasonic sensor, compares it against a safe threshold, and adjusts the motor speed accordingly. For example, if the distance is above 30 cm, the vehicle runs at full speed. If the object is within 30 cm, the speed is reduced, and if it is dangerously close, the vehicle stops to avoid a collision. This type of smart vehicle can be used in various applications such as robotic delivery systems, automated wheelchairs, educational robotics kits, or warehouse automation systems. By enhancing it with features like GPS, cameras, or even machine learning models, the same platform can evolve into a more advanced autonomous navigation system.

In conclusion, building a smart vehicle with obstacle detection and speed control using ESP32 is a practical and educational project. It combines sensor integration, motor control, and embedded programming into a cohesive system. With further development, this basic model can serve as the foundation for more sophisticated intelligent vehicle solutions.