	Department of Electrical, Electronics & Communication Engineering **GITAM School of Technology** **GITAM Deemed to be University** **Hyderabad** (Estd. u/s 3 of the UGC Act, 1956) NAAC Accredited with `A+' Grade Rudraram, Patancheru Mandal, Sangareddy District - 502 329, T.S., India

Department of Electrical, Electronics and Communication Engineering
News Letter
July-Dec 2024

G-Electra's 2nd Anniversary and Project Expo:

On 8th October 2024, G-Electra (smart systems club) celebrated its second anniversary with a Project Expo, marking a significant milestone for the club. The event was an opportunity for members to showcase their innovation and technical expertise in Artificial Intelligence (AI), Robotics, Internet of Things (IoT), and Smart Systems. With enthusiastic participation from students and support from volunteers, the event emphasized G-Electra's spirit of collaboration and commitment to advancing technology for real-world applications. The expo highlighted cutting-edge projects, bringing together students, faculty, and industry experts to foster creativity and knowledge exchange. The event was a great success, with high levels of participant engagement and contributions from dedicated volunteers who ensured everything ran smoothly.

Event Highlights:

● Project Expo:

The expo featured a diverse range of projects in AI, Robotics, IoT, and Smart Systems. These projects, developed by G-Electra members, aimed to address key societal challenges using advanced technology and engineering solutions.

● Judges Panel:

The projects were evaluated by an esteemed panel of judges:

- Dr. Pritee Parwekar
- Dr. S. Aparna
- M. Ragupathy
- Shaik Jhani Bhasha

Participant Engagement:

The expo witnessed enthusiastic engagement from participants across various departments and levels of expertise. Each project team actively demonstrated their projects, engaging with attendees, explaining their processes, and answering questions about their technology and applications. This interactive engagement helped foster a deeper understanding of the work behind each project and facilitated meaningful discussions between participants and attendees.
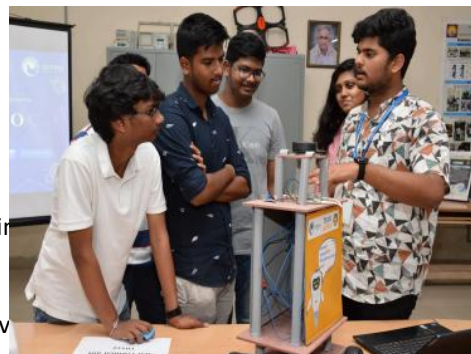
● Second Prize:

Tech Tinkers (FREE FLIGHT DRIVING WING) – Recognized for their creativity and problem-solving skills.

● Third Prize:

Electra Enigma (WASTE MANAGEMENT SYSTEM) – Commended for their impressive execution and project design.

Workshop

"Arduino Atelier 2: Empowering Innovation Through Hands-On Learning"

The G-Electra Smart Systems Club, in collaboration with the Department of Electrical, Electronics, and Communication Engineering, successfully organized the "Arduino Atelier 2" workshop. This event was designed to provide students with practical, hands-on experience in Arduino programming, allowing them to explore and understand the vast capabilities of Arduino technology. The workshop was met with enthusiastic participation, making it a resounding success.

Workshop Details

The workshop offered participants an in-depth introduction to Arduino, covering basic concepts and advancing to more complex programming and project implementation. It was designed to cater to both beginners and those with prior Arduino experience.

The session began with an introduction to the basic components of Arduino, including hardware and software environments. Esteemed faculty member Mr. M. Naresh Kumar led the session, explaining the fundamentals of Arduino and guiding students through the process of writing and installing simple programs.

Participants were then introduced to interfacing Arduino with various sensors and electronic components. The hands-on experience allowed them to build and test basic circuits, fostering a deep understanding of how Arduino interacts with different components.

As part of the workshop, participants implemented a range of projects, each designed to enhance their understanding of Arduino applications:

Clap Switch: Participants engaged with this hands-free control project, where they learned how to use a microphone module to detect the sharp sound of a clap and control electrical appliances. The system was designed to process audio input through the microphone sensor, which, upon detecting a clap, sends a signal to the Arduino. The Arduino then sends a signal, allowing the LED to turn on or off. This practical project highlighted the basics of sound detection, debounce techniques, and the convenience of hands-free operation, making it ideal for smart home applications.
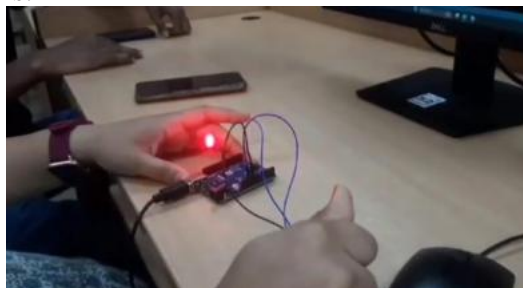
Mini Weather Station: Participants built a compact weather monitoring system using an Arduino Uno, a DHT11 sensor, and an LCD display to show real-time temperature and humidity readings. This project taught them how to collect and display environmental data, making it suitable for small-scale weather monitoring
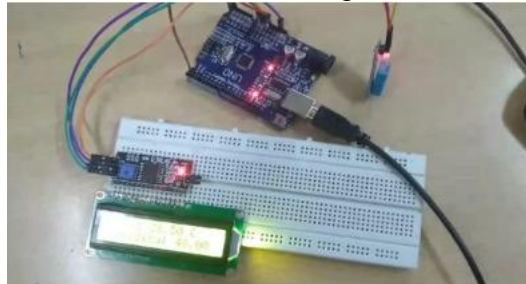
Smart Agriculture: This project focused on modern agricultural practices, using an Arduino-based soil moisture monitoring system to measure the water content in the soil. Participants used a soil moisture sensor connected to the Arduino, which provided real-time feedback on soil moisture levels through serial communication. The system helps in determining when the soil requires watering, making it a valuable tool for efficient water management in farming. This project highlighted the potential of Arduino in precision agriculture, helping to optimize resource usage and improve crop yields.
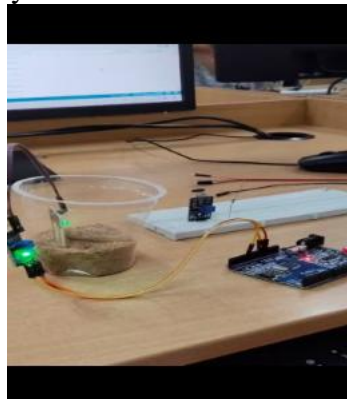

Music Activated Lights: This project focused on creating a system that utilizes a microphone sensor to detect audio signals, allowing the Arduino to synchronize LED patterns with music. The sensor captures the intensity and rhythm of sound, which the Arduino then processes to control the LEDs, creating a dynamic and visually engaging light display. As the music plays, the LEDs respond by flashing or changing colours in time with the beats, enhancing the auditory experience with a captivating visual element.

Automatic Night Light: This project introduced participants to the concept of ambient light sensing using a Light Dependent Resistor (LDR) and Arduino. The automatic night light system uses the LDR to continuously monitor the surrounding light levels. When the ambient

light drops below a predefined threshold, the Arduino automatically activates an LED, providing illumination during low-light conditions. This project emphasized energy efficiency and automation, demonstrating how Arduino can be used for practical, real-world applications like home lighting systems.
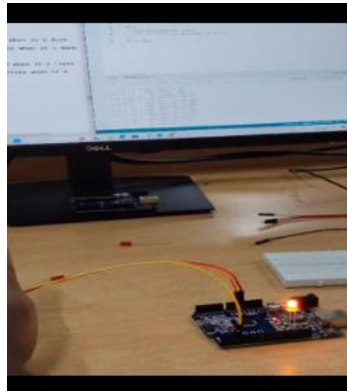
Participant Engagement

The workshop was well-attended by students from various departments, all eager to learn and apply new skills. The participants showed great enthusiasm throughout the sessions, actively engaging with the material and asking insightful questions. Their curiosity and willingness to experiment were evident as they worked on their projects, often exploring more advanced functionalities of Arduino.1

Student Team

"Robotics 1.0: Igniting Innovation Through Hands-On Learning"

G-Electra (Smart Systems) Club of GITAM (Deemed to be) University, Hyderabad, successfully hosted Robotics 1.0 in collaboration with the Department of EECE and in association with the Indian Institute of Technology Bombay (IITB). It was an engaging and educational event aimed at inspiring students and enthusiasts to explore the exciting world of robotics. The event served as a platform for participants to learn from experts, gain insights into robotics competitions, and experience live demonstrations of robotic technologies.

The event was a thoughtfully designed platform aimed at providing participants with a well-rounded understanding of robotics. It combined technical education, hands-on demonstrations, and career-oriented insights to create a holistic learning experience. Attendees were introduced to the latest advancements in robotics through sessions conducted by industry experts, who shared valuable knowledge about emerging technologies and their applications. These sessions laid a strong foundation for understanding robotics' potential and its transformative impact on various industries.

Participant Engagement:

The Robotics 1.0 Workshop attracted an overwhelming response from students and robotics enthusiasts who were eager to expand their knowledge and actively participate in the diverse array of planned activities. From the seamless and well-organized verification of registrations to the dynamic and interactive sessions, the event maintained an engaging atmosphere throughout.

Participants displayed exceptional curiosity and enthusiasm during the detailed explanation of the IIT Bombay Zonal Competitions. This segment provided valuable insights into the structure, challenges, and expectations of the competition, motivating attendees to aspire for excellence in robotics. The highlight of the workshop was undoubtedly the live demonstration of a pickup and line-following robot. This hands-on display captivated the audience, showcasing the practical applications of robotics and inspiring them to envision their own innovative creations.

The interactive Q&A sessions following each segment provided participants with the opportunity to clarify their doubts, exchange ideas, and delve deeper into the intricacies of robotics. The enthusiasm during these discussions was palpable, as attendees actively engaged with the resource persons, demonstrating their keen interest in exploring the limitless potential of robotics.

Overall, the Robotics 1.0 Workshop served as a dynamic platform for learning, collaboration, and inspiration, leaving participants motivated to embark on their own robotics journeys.

Outcome:

Robotics 1.0 successfully provided participants with an immersive and comprehensive experience in the dynamic field of robotics. Designed for both beginners and those with some prior knowledge, the workshop ensured that all attendees could gain valuable insights and hands-on skills. Led by an expert resource person, the sessions covered everything from the basics of robot mechanics to advanced design techniques, guiding participants step-by-step through building their own functional robots.

A key outcome was that participants gained practical knowledge in robot construction, equipping them for robotics competitions, including those organized by IITs. They received in-depth guidance on creating stable and effective line-following and pick-up robots, with a focus on building reliable, real-world models. This hands-on approach, combined with discussions on current industry trends and future innovations, provided participants with a well-rounded understanding of robotics and its various applications in areas like healthcare, manufacturing, and autonomous systems.

One of the workshop's highlights was a live demonstration of a fully functioning robot, which brought theoretical concepts to life. This demonstration allowed participants to see first-hand how coding, mechanics, and problem-solving strategies translate into real-world solutions, deepening their understanding of how robots function.