KORAMBAYIL AHAMED HAJI MEMORIAL
UNITY WOMEN'S COLLEGE, MANJERI
(P.O) Narukara, Malappuram Dt., Kerala - 676 122
(Govt.- Aided and affiliated to University of Calicut)
[Nationally re-accredited by NAAC with 'B++' Grade, CGPA 2.77]
www.unitywomenscollege.ac.in

INNOVATIVE ECOSYSTEM FACILITATED BY IQAC IN THE INSTITUION FOR TEACHING-LEARNING, EVALUATION AND RESEARCH

Internet of Things (IoT) Lab- Supported by IQAC & College Governing Body

The Internet of Things (IoT) Lab is an advanced facility designed to support students and faculty in the experimentation and development of IoT-based projects and applications. Established with the vision of promoting interdisciplinary learning. The IoT Lab plays a crucial role in enhancing technical skills and fostering innovation among students in the Department of Computer Science.

The IoT Lab is a significant asset for both the department and the institution. It fosters a practical learning environment, bridges the gap between academia and industry, and equips students with cutting-edge skills to thrive in the rapidly evolving technological landscape. The lab's contributions align with the college's commitment to producing well-rounded graduates capable of addressing complex technological challenges.

Objective and Vision

The primary objective of the IoT Lab is to provide hands-on experience in IoT technologies, enabling students to understand how interconnected devices can be leveraged to solve real-world problems. The lab seeks to create a platform where students can develop skills in designing, implementing, and testing IoT systems. The lab aligns with the college's broader mission to produce technically competent graduates who are equipped to meet the demands of modern industries.

Equipment and Infrastructure

The IoT Lab is equipped with modern infrastructure and state-of-the-art devices that enable students to work on both foundational and advanced IoT projects. The lab is furnished with:

- Desktop Computers for developing applications for IoT devices.

- Arduino and Raspberry Pi kits, widely used in IoT development for prototyping.

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- Sensors including temperature, humidity, motion, gas, rain, sound and light sensors, which are essential for data collection in IoT applications.

- Wi-Fi modules, Bluetooth modules and Ethernet shields for enabling wireless communication between devices.

- Breadboards, jumper wires, resisters, capacitors, transistors, ICs and other essential components for circuit design and assembly.

- IoT cloud platforms for real-time data monitoring and analysis.

- The laboratory provides all necessary tools for students to work on projects ranging from simple sensor-based systems to more complex IoT networks, integrating data analytics and machine learning.

Key Activities and Projects

The IoT Lab regularly conducts workshops, hands-on training sessions and exhibitions to familiarize students with IoT technologies. A major initiative is the IoT Club, formed by students and faculty members, which encourages peer learning and collaboration. Through this platform, students get opportunities to develop innovative projects and participate in inter-collegiate competitions.

Notable student-led projects

- Robotic Kiosk: A project designed to enhance user interaction through self-service capabilities. Its a fully autonomous kiosk system capable of interacting with users for various purposes such as information dissemination, assistance etc.

- Smart Agriculture Monitoring System: A project aimed at improving crop productivity through IoT-based monitoring of soil conditions, weather, and moisture levels.

- IoT-enabled Health Monitoring System: A wearable device that tracks vital health statistics and sends real-time data to healthcare professionals for timely interventions.

- Smart Campus Solutions: This project integrates smart lighting, security systems, and energy management in the college campus using IoT technology.

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- The lab has also facilitated interdisciplinary projects that bridge technology with other fields such as environmental science and healthcare.

- Automated Cloth Drying System: This project uses a rain sensor to detect weather conditions and automatically dries washed clothes by retracting or covering them during rain.

- Smart White Cane for the Visually Impaired: A cane equipped with sensors to assist blind individuals in navigating their surroundings safely and effectively.

- Water Level Detection System for Flood Monitoring: A sensor-based system designed to monitor water levels in real-time to understand and respond to potential flooding risks.

- Robotic Cars: Various student projects focusing on creating automated robotic cars capable of performing diverse tasks.

- Line Detection and Following Robot Car: A robotic car project that detects and follows specific lines on the ground, showcasing basic autonomous navigation.

- Object Detection Cars: Autonomous robotic cars with integrated object detection sensors, enabling them to identify and respond to obstacles in their path.

- Eye Blink Sensor Project: A wearable device that detects eye blinks, developed to assist individuals with mobility issues by translating blinks into commands for controlling devices.

- Gas Detection Sensor Project: A sensor-based system for detecting gas leaks in homes, providing early warnings to prevent accidents caused by gas leakage.
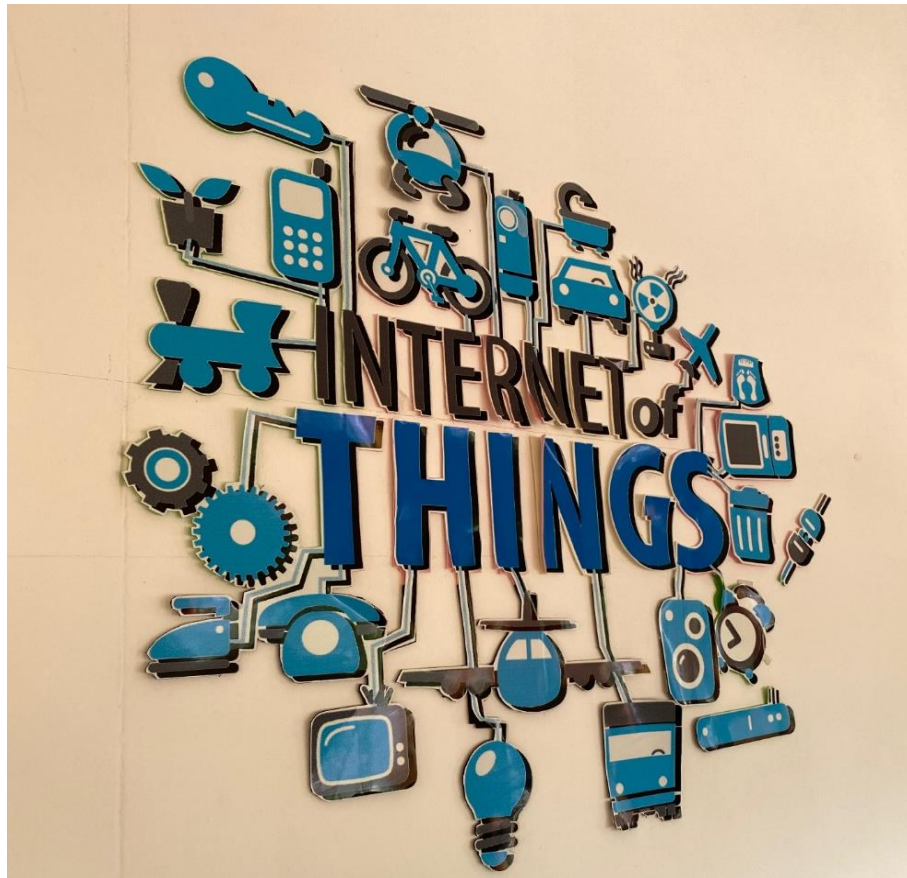
Future Plans

The Department of Computer Science plans to further expand the IoT Lab by integrating advanced technologies such as edge computing, 5G networks and more AI & Cloud-driven IoT systems. The lab will also host an IoT exhibition annually, where students can showcase their projects to the public and industry representatives. Additionally, there are plans to introduce more certificate courses and training programs in IoT to enhance the employability of students.

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