National Institute of Technology Rourkela

Departmental Seminar

Seminar Title	: Application of Secure and Energy-Efficient Data Access Solutions in Industrial IoT for Small-Scale Industry.
Speaker	: Lopamudra Samal.
Supervisor	: Prof K K Mahaptra
Venue	: VLSI Lab
Date and Time	: 30 Dec 2024 (5.00PM)
Abstract	: Data security in small-scale industries protects sensitive information, ensuring smooth operations and minimizing disruptions. This paper aims to enhance security and authentication in such environments using an ESP32 microcontroller for energy-efficient data acquisition. The ESP32 creates a self-contained Wi-Fi network with a SoftAP IP, enabling secure access without relying on the global internet, one of the approach to preventing external attacks. Clients connect via a browser, providing a username, password, and authentication key for access. Authenticated users can control devices, read sensor data, and monitor statuses. In terms of energy usage, the ESP32 consumes 195 mA during Wi-Fi transmission and 148 mA in idle mode. Powered by a 9V battery, it offers an estimated runtime of 6.99 hours during transmission and 9.21 hours in idle mode, making it suitable for battery-powered setups. This system is ideal for secure industrial automation, local monitoring, and access control, ensuring only authorized personnel interact with critical systems and data.