

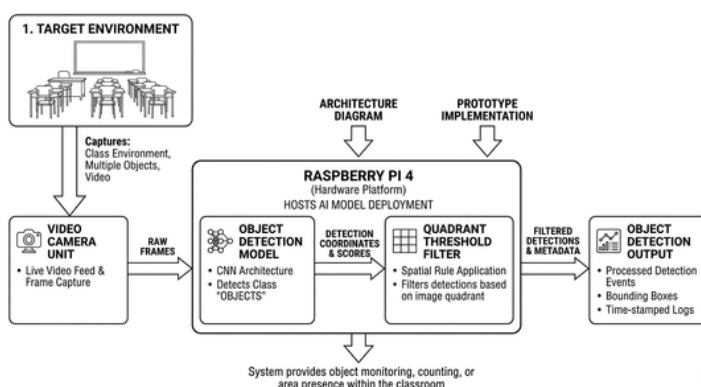
SMART CAMPUS MANAGEMENT SYSTEM AND METHOD FOR ELECTRICAL ENERGY CONSERVATION

Seeking parties interested in licensing and commercialization of technology.

Technology Brief

The system relies on edge-based computer vision sensors and deep-learning inference models to perform real-time occupant detection and spatial mapping directly within the classroom. Rather than relying on simple motion detectors, these vision algorithms process local video feeds to accurately count students, track zone-level density, and calculate live thermal loads without storing or transmitting personally identifiable media. This occupancy telemetry is streamed via low-latency IoT protocols (such as MQTT) to smart relays and building management gateways (BACnet/Modbus), which dynamically modulate HVAC setpoints and zonal LED lighting to match actual room usage. The end-to-end architecture operates autonomously, pairing edge processing for data privacy with closed-loop environmental controls to systematically eliminate idle power draw while maintaining optimal learning conditions.

Block Diagram



Salient Features

Despite the widespread adoption of digital technologies in education, many classrooms still rely on conventional methods that lack automation, resulting in inefficient energy usage, time-consuming attendance management, and limited personalization of the learning experience. Electrical devices such as lights, fans, and projectors are often left operating unnecessarily, leading to excessive energy consumption.

Traditional attendance methods consume valuable instructional time and are prone to errors and proxy attendance. Additionally, existing teaching approaches do not adequately adapt to the diverse learning needs and engagement levels of students. These challenges highlight the need for an integrated smart classroom solution that combines automated energy conservation, intelligent attendance monitoring, and adaptive learning technologies to improve operational efficiency, reduce resource wastage, and enhance the overall teaching and learning experience.

Technical Applications

- ✓ Primary Applications are Schools, Engineering Colleges, Universities and Smart Campuses.

Glimpse of the Technology



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TECHNOLOGY SECTOR

Clean Energy & Sustainability



IP STATUS

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TECHNOLOGY READINESS LEVEL

TRL 4

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