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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

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ESP32-CAM Based Surveillance System

Abstract :

This project focuses on the design and implementation of a budget-friendly surveillance system using the ESP32-CAM microcontroller. The system enables real-time video streaming to a smartphone or personal computer via Wi-Fi, allowing users to monitor environments remotely. A key feature of the system is its integrated motion detection capability, which automatically activates video recording or sends alerts to users when movement is detected in the camera's field of view. The setup supports optional storage of recorded footage either locally on a microSD card or remotely through cloud integration, offering flexibility based on user needs and available resources.

In addition to its practical applications for home or lab security, the project serves as an educational tool that introduces users to core concepts in embedded systems, Internet of Things (IoT), and image processing. By working with the ESP32-CAM platform, users gain hands-on experience in setting up a wireless camera module, implementing motion-based triggers, and handling video data transmission. This project illustrates how affordable components can be combined to create a functional and efficient surveillance system, making it a valuable exercise in applied electronics and smart monitoring technologies.

Keywords: Cloud integration, Embedded systems, ESP32-CAM, Image processing, IoT, Motion detection, Real-time streaming, Surveillance, Video transmission, Wireless communication

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