IOT-BASED HOME DOOR SECURITY SYSTEM USING SW-420 VIBRATION SENSOR AND ESP32-CAM WITH TELEGRAM NOTIFICATION

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ABSTRACT

Home security is a critical factor in ensuring a safe living environment, especially in response to the rising number of burglary cases in residential areas. This study aims to design and implement an IoT-based smart door security system using the ESP32-CAM, SW-420 vibration sensor, and MC-38 magnetic door sensor, equipped with real-time notification features via the Telegram application. The system is engineered to detect vibrations and door status (open or closed) in real-time, sending both text and image alerts directly to the user through Telegram. The methodology involves hardware and software design, sensor integration, and performance testing under various threat scenarios. Test results show that the system can accurately detect every event, with an average response time of 3–6 seconds and a 100% detection success rate. Moreover, the system supports remote commands, including system activation, photo capture, and flash control via a Telegram bot. With its efficiency, responsiveness, and relatively low cost, this IoT-based security solution proves to be a practical and reliable approach for enhancing home security.

Keywords: Internet of Things (IoT), ESP32-CAM, SW-420, MC-38 magnetic sensor, security system, Telegram notification.