# Simple Security Alarm System Using ESP32 and Blynk IoT App

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**Abstract**: *Since security and protection are the topmost priority in the current age, particularly at urban homes and business spaces, the need for effective and secure security surveillance systems has grown manyfold. Conventional security systems are usually expensive, complicated, or beyond the means of small consumers. This paper outlines the design and development of a lowcost, effective motion-detecting security alarm system based on the ESP32 microcontroller, a 30-pin low-power, Wi-Fi and Bluetooth chip widely utilized in Internet of Things (IoT) devices. The system utilizes a Passive Infrared (PIR) sensor for human motion detection based on a change in infrared radiation and a buzzer for immediate audible warning on the detection of unwanted movement.*

*The program of the system is coded with the Arduino IDE and supplemented with integration with the Blynk IoT platform, which provides real-time remote alerts directly to a user's smartphone. When movement is detected, the ESP32 interprets the input signal from the PIR sensor, triggers the buzzer to attract nearby attention, and at the same time sends an instant push notification to the Blynk server. All the hardware parts—jumper wires included, and a breadboard—enable quick prototyping and system construction without using solder, which makes it perfect for students, hobbyists, and programmers who want to deploy a low-cost and scalable security solution.*

*The project is a testament to the combination of embedded systems and IoT technology that came together to create a small, responsive, and easy-to-use security alarm that can be used in residential areas, small offices, and localized settings. With the provision of real-time monitoring and remote response, such a system offers enhanced user sensitivity and control, enabling safe living and working environments with low capital costs. The process described here is a testament to the ability to design smart, networked security systems using available and inexpensive components.*

**Keywords**: ESP32, Blynk, PIR Sensor, IoT, Security Alarm, Motion Detection, Embedded Systems