ABSTRACT

IoT-Based Motorcycle Security System to Prevent Motorcycle Theft in Student Boarding Houses in Purwokerto

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Motorcycle theft in Purwokerto, especially in parking areas and surrounding environments, remains a major issue. To address this problem, this study developed an Internet of Things (IoT)-based security system consisting of a GPS sensor for location tracking, an RFID sensor for authentication, and an ultrasonic sensor for detecting suspicious activity. The system is controlled by a NodeMCU ESP32 microcontroller connected to the internet via a MiFi network, with real-time notifications sent to the vehicle owner through the Telegram application and a buzzer activated as a physical alarm. The test results show that the system functions well, with notifications sent within an average of 5 seconds after a threat is detected. The GPS sensor can transmit location data with high accuracy, with a response time of 5 to 7 seconds for each command. The RFID system achieved a success rate of 80% to 100%, even with obstacles present. In a theft simulation, the system successfully provided an early warning in 90% of cases, This system is effective and reliable in enhancing early warning and providing a quick response to potential theft.

Keywords: Motorcycle security, IoT, GPS, RFID, ultrasonic sensor.