## *ABSTRACT*

## *DESIGN OF MOTORCYCLE SECURITY SYSTEM BASED ON INTERNET OF THINGS (IOT) USING ESP32*

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*The high number of motorcycle thefts in Indonesia demonstrates the weakness of conventional security systems still widely used by the public. This condition is a serious problem, especially because theft often occurs when vehicles are parked unattended. The urgency for a more effective and affordable security system is increasing, considering that not all vehicles are equipped with advanced technology such as smart keys. Along with technological developments and the widespread use of the Internet of Things (IoT), security solutions are needed that can provide protection that is easily accessible through mobile devices. This research aims to design and build an IoT-based motorcycle security system using an ESP32 microcontroller as a control center. The system is equipped with an ultrasonic sensor to detect suspicious objects around the vehicle, a magnetic reed switch sensor to monitor the position of the side stand, and a NEO6MV2 GPS module for real-time location tracking. Information from the system is sent to the user's smartphone via a Wi-Fi connection using the Telegram Bot interface. The method used in this research is an experimental method, with stages of hardware and software design, system integration, and sensor and notification performance testing. The system is tested under various conditions to ensure the reliability of detection and the accuracy of notification delivery. The expected outcome of this design is a vehicle security system capable of providing real-time notifications based on threat levels and helping users remotely monitor the condition and location of their vehicles. This system is also expected to be an economical and easily implemented alternative solution for the general public, with potential for further development for other types of vehicles or assets.*

***Keywords:*** *ESP32, GPS, IoT, Security, Sensors, Motorcycles.*