

## **ABSTRACT**

*Transportation is one aspect of people's lives to carry out daily activities. One alternative transportation that is the best choice for people in Indonesia is a motorcycle. Motorcycles are often the target of theft due to weak vehicle supervision. This is because motorcycle security generally only uses conventional safety locks that still have gaps that can be broken into using a special key. So, to increase motorcycle safety, technological innovation is needed to overcome the shortcomings of the security system by creating a security system that can find out the location of the motorcycle and be controlled remotely.*

*This final project research designs and implements a motorcycle security system using the Global Positioning System (GPS) as a location tracker. The Final Project integrates all systems connected to a motorcycle that can be monitored using an application on a smartphone using the Internet of Things (IoT) method. This security system uses a NodeMCU module that connects the system to the internet, equipped with a SW-420 vibration sensor to detect vibrations that occur on a motorcycle and a relay to disconnect the motorcycle's electricity.*

*The results of this study indicate that the designed system can work and function well. The results of the SW-420 sensor data compared with a digital multimeter have an error percentage of 1.45%. The results of the GPSNEO6MV2 Module data compared with Google Maps. The difference in the distance reading of the coordinate points on average reaches 5.67 meters with an average percentage error of 2.66%. The test results show the average delay between the tool and the firebase is 220.75 ms with a throughput value of 2900 bps. In testing the application, the user can control and track a motorcycle vehicle.*

**Keywords:** *Motorcycle Safety, Internet of Things, Global Positioning System, NodeMCU, Sensor SW-420*