IJARSCT
International Journal of Advanced Research in Science, Communication and Technology
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
ISSN: 2581-9429
Volume 5, Issue 2, May 2025
Impact Factor: 7.67

IOT-Based Bike Rider Safety Monitoring System

Mr. Pranav Bhave[1], Miss. Sanika Gaikwad[2], Mr. Sanskar Gadekar[3], Mr. Rushikesh Ghuge[4], Prof. Mahesh Kadu[5]
Students, E & TC Engineering Department[1,2,3,4]
Prof, E & TC Engineering Department[5]
Amrutvahini College of Engineering., Sangamner, India

Abstract: *Road safety for two-wheeler riders is a significant concern due to helmet non-compliance, drunk driving, signal violations, and delayed emergency response. This project presents an IoT-based bike rider safety and traffic monitoring system that improves safety through real-time monitoring, automated alerts, and cloud-based data storage. The system consists of three primary units: Helmet Unit, Bike Unit, and Signal Unit, each designed to enhance road safety. The Helmet Unit ensures that the rider wears a helmet and is not intoxicated using IR and MQ-3 sensors. If the rider fails to meet these conditions, the bike remains locked, and the event is recorded in the IoT cloud. The Bike Unit monitors side stand position, oil level, and obstacle detection using a limit switch, ultrasonic sensors, and an LCD display. It also integrates a MEMS sensor that detects if the bike tilts 90 degrees, indicating a possible accident. Upon detection, the GSM module sends an emergency SMS alert with GPS coordinates to predefined contacts. The Signal Unit enforces traffic signal compliance using an RFID scanner and ultrasonic sensors, ensuring no vehicle crosses during a red light. All real-time data from the Helmet Unit and Bike Unit is uploaded to the IoT cloud, allowing remote monitoring and quick emergency response. By combining IoT connectivity, sensor-based automation, and cloud-based monitoring, this system provides an efficient and scalable solution for accident prevention, traffic regulation, and improved rider safety.*

Keywords: IoT-based bike safety, Smart helmet system, Real-time accident detection, Traffic rule enforcement, Emergency alert system

DOI: 10.48175/IJARSCT-26246