

# Smart Helmet for Bike Using Node MCU

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**Abstract-** According to the law of the Indian government as per section 129 of the motor vehicle act of 1988 briefly explains the motorcycle or two-wheeler rider is mandatory to wear the helmet while driving and the recent survey conducted on road accidents by the world health organization (WHO). This WHO organization has briefly mentioned the cause and the prevention of road accidents that are happened around the world. They also mentioned the highest death rate that took place in India and the survey also reported as per the rate 1.5 lakh of road death has been accounted for by each year approximately. The above article motivates us to develop a system that is capable of providing safety and precaution to the bike rider. We designed a system that is capable of detecting the rider is whether wearing the helmet or not. Then detecting if the rider has consumed alcohol or not, whether if these two conditions are yet satisfied then only the motor will ignite or else it will not ignite. In case an accident occurred, our system is capable of detecting the accident and its location approximately. We implanted the led strip indication in the helmet unit to reduce the percentage of an accident during night times

## I. INTRODUCTION

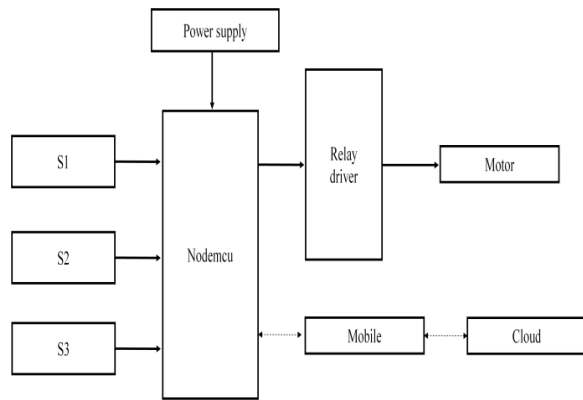
Nowadays there are many bike accidents occurred in our country and violation of traffic rules by the riders is increasing upon day by day. Most of the accident cases are due to the negligence of wearing the helmet without any special reason and the rider is not aware of traffic rules. There is no proper awareness and the importance of traffic rules and road safety. The official analysis of road accidents by the national crime records bureau's report on road accidental deaths that more than 500 bike accident cases were filed due to drunken driving or rider under the influence of the drug. To reduce these types of accidental cases for the bike rider, we proposed a system which is capable of providing safety, security, and precaution for the bike riders. We named it a smart safety helmet system. The first process of our system is to check whether the bike

rider is wearing the helmet or not. If the bike rider is not wearing the helmet, the vehicle will not start. For that, we are using a force-sensing resistor sensor (FSR), which is capable of sensing the presence of the rider. The second process is to find out, whether the bike rider has consumed alcohol or not. If the bike rider is drunken the vehicle will not start, this can be implemented using the MQ-3 alcoholic sensor. The MQ-3 stands for mingan and qi lai, mingan means 'sensitive' and qi lai means 'gas' in Chinese terms. This alcoholic sensor can find out the alcohol presence in the breath of the rider if the permitted range is exceeded then the vehicle will not start. Whether these two conditions satisfy only then the vehicle unit will start or else it will fail to start. The third process is to check whether the vehicle is suspended in an accident or not. For that we are using a vibrating sensor also called a piezoelectric sensor

## II. OBJECTIVE

The primary objective of a Smart Helmet for biking using NodeMCU is to enhance rider safety through advanced technological integration. This helmet aims to detect accidents and falls using sensors like accelerometers and gyroscopes. When an accident is detected, the system can automatically send alerts, including the rider's location, to emergency contacts or services, ensuring timely assistance. Additionally, the helmet may feature GPS tracking, allowing real-time location monitoring, and potentially integrating with smart devices for hands-free communication and navigation, further contributing to a safer and more convenient biking experience.

## III. METHODOLOGY



#### A) Working

The Smart Helmet for biking using NodeMCU operates by integrating various sensors and communication modules to ensure rider safety and enhance the overall biking experience. The NodeMCU microcontroller serves as the central unit, processing data from accelerometers and gyroscopes embedded in the helmet. These sensors continuously monitor the rider's movements and detect unusual patterns indicative of falls or accidents. In the event of an accident, the NodeMCU triggers the communication module, typically a GSM or GPS module, to send an alert message with the rider's precise location to pre-defined emergency contacts. Additionally, the helmet can incorporate Bluetooth connectivity, allowing it to pair with smartphones for hands-free communication, navigation assistance, and music control. This seamless integration of sensors and communication technologies ensures that the rider remains safe and connected while on the road.

#### B) Result & Model

The result of implementing a Smart Helmet for biking using NodeMCU is a significant enhancement in rider safety and convenience. With the integration of advanced sensors and communication technologies, the helmet can promptly detect accidents and falls, ensuring that emergency services or contacts are notified immediately with the rider's location. This rapid response capability can be crucial in reducing the time it takes to receive help, potentially saving lives. Furthermore, the inclusion of features like GPS tracking and Bluetooth connectivity adds to the convenience, allowing riders to navigate easily, communicate hands-free, and enjoy multimedia

functions without compromising safety. Overall, the Smart Helmet transforms the biking experience by providing a robust safety net and enhancing usability through smart technology.



#### C. Conclusion

In conclusion, the Smart Helmet for biking using NodeMCU represents a significant advancement in rider safety and technological integration. By leveraging sensors to detect accidents and falls, and communication modules to send emergency alerts and enable hands-free connectivity, the helmet ensures that riders are better protected and more connected while on the road. This innovative solution not only enhances the immediate response to emergencies but also improves the overall biking experience with added convenience features. As a result, the Smart Helmet stands as a vital tool in promoting safer and smarter biking for all riders.

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