

A Review paper on Smart Helmet for Rental Vehicles

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Submitted: 30-07-2021

Revised: 06-08-2021

Accepted: 08-08-2021

ABSTRACT:IOT has enabled us to connect our day to day devices in a network for a sole purpose to exchange data. Today a number of countries has made it mandatory to wear helmet while riding. In this paper, we describe a helmet which is made smart using latest IOT technologies. The present system doesn't include helmet tracking and theft prevention. Because of increasing number of theft cases of the two wheelers there is a need to enhance the security level of the bikes. Traditional and commonly used key locks available in the bikes are well known to the thieves and thus it can be easily unlocked by the professional thieves. The safety of the rider is also a matter of great concern. To overcome these issues a system is required that can help achieve the security of the vehicle and safety of the rider. This helmet for the comfort of riders provide various functions such as use navigation services, the load cell detects the weight and judges whether rider is with the pillion or not. Flex sensor will help in detecting helmet wearing position, tilt sensing also detect, alcohol sensor detects the alcohol content. The Smart Helmet system is planned to be a solution for any motorcycle rider that wishes to increase his or her awareness, and safety, while driving. The concept of proximity sensing in automobiles is not a new concept, and has been realized in different projects, and commercial products, before this one. However, such realizations tend to have their own set of advantages and disadvantages associated with them. The design and implementation of the Smart Helmet system seeks to maximize the advantages from similar products, while increasing the safety of rider, pillion rider and also the safety of helmet. What sets the Smart Helmet apart from existing products is the lower cost and ease of use to ensure any rental motorcycle rider can afford and use it. To make this project as user friendly and durable, we need to make it compact and cost effective. Going further, most of the units can be embedded along with the controller on a single board with

change in technology, thereby reducing the size of the system. This module can be implemented on cars and bicycles in real times applications.

KEYWORDS:ESP32, GPS module, Load cell, Helmet, Accelerometer, Security, Anti-theft.

I. INTRODUCTION

In this era of increasing road accidents, a large number of people meet with accidents. Many lives could have been saved if the emergency service could get the crash information in time. As such, efficient automatic accident detection with an automatic notification to the emergency service with the accident location is a prime need to save the precious human life. As a remedy for these problems, we are designing an intelligent system that ensures the safety of biker by making it necessary to wear helmet, as per government guidelines, prevents road accidents to a limit by detecting alcohol consumption and detect crash and can notify quickly the accident to emergency numbers. By using this proposed system, it sends an automatic alert message to the authorized person or ambulance in case of an accident or any emergencies. The alert message body contains the place and time of the consequences to speed up the first aid service to the victim. Rental bike start-ups in India that offer the services of giving bikes and scooters along with helmets. Since these start-ups are in growing stage currently, they require to operate at low cost and make maximum profit. Due to this, they have hired as much fewer personnel as possible and removed the intermediary responsible for taking care of bikes and scooters. These startups are completely based on Automatic technology. The only human involved in complete process is the customer booking the vehicle. In general, these start-ups use IoT and Bluetooth technology for locking and unlocking the vehicle, which has been accepted as a very easy way to handle the operations of vehicle whether it be payment related, locating the vehicle or registering any complaint.

Alike all the automation technologies these also have drawbacks. People with unethical values or due to some reasons either damage the vehicle or steal the things associated with vehicle. Of all these drawbacks, stealing the helmet is most prominent one. There has to be some efficient and inexpensive monitoring system that can control all this and avoid the extra cost being spent by the company on vehicle's accessories. Steps can be taken in removing the drawbacks of present bike rental system and aiding the companies to make the ongoing technology the more efficient one. This project also serves the purpose to avoid the helmets being stolen away from the vehicle. This project can help to overcome the stealing problem. As an overview, the purpose can be fulfilled by enabling the mobile application to charge penalty to the rider if helmets are not in the vehicle and preventing the theft of helmet.

II. LITERATURE SURVEY

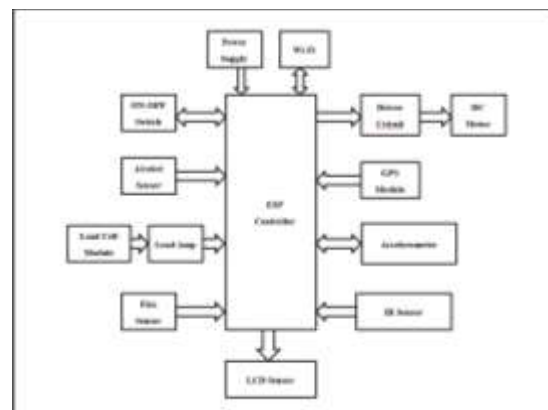
[1] Edna Elizabeth et al had developed a smart helmet device for detecting and reporting bike accidents. Smart helmet system comprises of various sensors, and it identify the accident by evaluating uneven or irregular variations obtained from sensor system, and a trigger will be sent to Pager Duty from the microcontroller. Pager Duty will then triggers a call to the phone number registered by the motorist. If the driver does not respond to it for a period of 5 minutes after the first call is initiated, then the emergency contacts will be informed with the details about the accident. The emergency contacts will be alerted through text message, e-mail, and phone call until they acknowledge the incident. In real time, this system assures a reliable and quick delivery of information relating to the accident.

[2]Selvathi et al had designed a system which automatically detects if the rider is wearing a helmet and also checks whether the rider has consumed alcohol before starting the ride. The relay attached to the engine will turn ON if and only if both the conditions are met. The Microcontroller in the system controls the functioning of relay and thus the ignition. This system also identifies the bike accident at any place and alerts the concerned person about the accident.

[3]Archana D et al had proposed a system which will not allow driver to start the engine without wearing the helmet. When rider wore the helmet, helmet will be locked and engine will be switched ON.

III. PROPOSED SYSTEM

In this system, ESP32 controller is used. When the prototype is switched on, it checks whether the rider has worn the helmet or not. If he does not wear the helmet, bike will not start and intimate to rider to wear the helmet else it will check if the rider is drunk or not. If the rider is found drunk, the engine will not start, else the mechanism will check for pillion rider wearing helmet or not, if helmet is not found, the bike won't start, else it'll check for triply, if triply is found, the ignition won't occur else the engine will start and ride starts. When the rider crashes, the helmet hits the ground and the accelerometer detects the tilt that are created when the helmet hits the ground and then the microcontroller detect the accident occurrence and it will send information about the accident and location of accident using GPS modules. The project is designed using structured modeling and is able to provide the desired results. creating major breakthrough in various fields, and hence technology keeps changing from time to time. Going further, most of the units can be fabricated on a single along with microcontroller thus making the system compact thereby making the existing system more effective. To make the system applicable for real time purposes components with greater range needs to be implemented.



Advantages of proposed system

Longer range of communication. Wi-Fi is not affected by noise. Accident prevention is done. The system will ensure that the motorbike will not start unless the rider is wearing a helmet and has not consumed alcohol. In case if any pillion rider is found, the rider will undergo the same checks. In addition, GSM technology is used to inform the family members in case of an accident.

Disadvantages of proposed system

It should be online every time. Accuracy may not be 100%. No updates of the particular system devices, if the device is defective. The bike will not start unless we wear the helmet. Miss handling of the helmet may cause unnecessarily message alert. Cost of project is high.

Applications of proposed system

For the application of the smart helmet based on the presented design, it may include several fields such as:

1. Safety to rider

The helmet will ensure the safety of rider and the pillion (if any) by ensuring that they are not drunk. If the rider is sensed to be drunk by the alcohol sensor module, the vehicle's ignition will turn off and the person will not be able to ride the vehicle.

2. Reduce accidents

Due to the presence of tilt sensor inside the helmet, the module will detect accident. In case of any accident, the helmet detects it and by using the GPS and GSM module, it will send message and GPS position to the hospital and emergency contacts.

3. Low cost and less complexity

The sensors used in the model are very cheap and is budget friendly for an average rider. A very simple mechanism is used for overall operation and is very easy to use.

4. Helmet anti-theft

At the time of completion of ride, the system detects the presence of helmet, which is to be kept back in the trunk by the rider. If the helmet is not found inside the trunk, the rider will be charged a penalty and the helmet will be considered stolen.

IV. CONCLUSION

The two-wheeler safety system developed with smart helmet and intelligent bike system is reliable and aims to help in the prevention, detection and reporting of accidents hence reducing the probability of the drunk drive cases. The system also ensures that the helmet is placed back in the trunk after the end of ride, ensuring the safety of helmet. Our proposed system gives the primary importance of preventing the accidents and ensures safety for a greater extent in two wheelers. Nowadays, most accident cases occur due to motor bike. The severities of those accidents are increased because of the absence of helmet or by the usage of alcoholic drinks. By implementing this system, a safe two wheeler journey is possible which would decrease the head injuries throughout accidents caused due to the absence of helmet and additionally reduce the accident rate due to drunken

driving. An IR sensor is used so as to ensure the safety of helmet after the end of ride.

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