IoT Based Bike Rider Safety and Bike Analyzer

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Abstract: A smart helmet is used by riders for safety purpose. Helmet provides safety for the riders from accidents, but we can observe that many people are not wearing helmet and of course it can lead to road accidents. The other reasons which will result in road accidents are rash driving, drunken driving etc. The main aim of this project is to achieve the bike riders safety. The Helmet can be implemented by using advanced features. The advance features can include alcohol detection, accident detection, identification of whether the rider is using the helmet or not, to track activities of a rider via GSM etc. The prototype includes two parts namely helmet part and vehicle part. To make sure that the bike rider is wearing helmet, we are making use of touch sensor present in helmet part. Alcohol sensor is used to check the alcoholic substance in the bike rider's breath. If the alcoholic substance is present in the rider's breath, then the vehicle doesn't start. Vehicle unit uses vibration sensor for the accident detection. The RF transmitter present in the helmet unit will sync with the RF receiver on the bike to ensure that the rider has worn helmet. GSM placed on the vehicle is used to track the status of the bike rider and send messages to the registered mobile number. Android application is provided in case of helmet lost/forgotten.

Keywords: GSM, Smart helmet, RF transmitter, RF receiver, sensors, Accident detection, Alcohol detection.

1. Introduction

The helmet has been made compulsory in Karnataka state. The main reason for this rule is accidents have been increasing every year. This is the major issue for developing the Smart Helmet Project.

The Smart Helmet project consists of Helmet part and Vehicle part. The helmet part consists of two sensors. First sensor is Touch sensor and it is used to make sure that the bike rider is wearing the helmet. Second Sensor is Alcohol sensor, it is used to detect the alcoholic substance in the rider's breath and vehicle will not start if the rider has consumed the alcohol. These sensors are connected to RF transmitter present in the Helmet Unit which is responsible for sending the signals to RF receiver present in the Vehicle Unit. The vehicle will get started when it receives the signals from RF transmitter. The vehicle will remain off when the rider consumed alcohol and if the rider doesn't wear the helmet. Rash driving is also detected and vehicle will automatically have turned off if it exceeds the speed, the corresponding message will be sent to the registered mobile number. Vibration sensor is present in Vehicle unit. The

main purpose of this sensor is to detect accident and inform regarding this. Android Application can be used in case of helmet lost/forgotten.

2. Problem Statement

A. Existing System

The important part of the accidents happens because the rider was either not wearing helmet, rash driving, drunken driving or the accident was not revealed in time.

The existing system uses the wireless telecommunication technology, and it is connected to the mobile. The other existing system is associated with the alcohol sensor and eye blink sensor which takes main role in preventing road accidents. Another existing system has a sensor, using that sensor we can detect any crashes or accidents. The disadvantages of the existing system are 1) There is no alternative in case of helmet lost/forgotten, 2) There is no way to make compulsory for the rider to wear the helmet.

B. Proposed System

In the proposed system, the module consists of vehicle unit and helmet unit. Helmet unit and vehicle unit are interconnected to each other. Helmet unit consists of touch sensor and alcohol sensor which are connected to the RF transmitter. Vehicle unit receives the signals from the helmet through the RF receiver and then starts the vehicle. The status of the rider is tracked and it is sent to the registered mobile number via GSM. The rider can start his vehicle even if he lost/forgotten the helmet by using the Android application.

3. Methodology

The project consists of 2 parts as mentioned early. First part is Helmet we can observe in the fig. 1. Alcohol Sensor is placed close to the rider's mouth, so it can easily sense the alcoholic substance in the rider's breath. Touch sensor is placed in such a way that when the rider wears the helmet, it senses and sends the signals to the vehicle unit to start the vehicle. RF transmitter is also present in the helmet, it sends the appropriate signals to the RF receiver. Antenna is present outside the Helmet.

Second part is Vehicle, we can observe in the fig. 2. RF receiver is present in the vehicle. It receives the signals sent from the helmet. If conditions are true (if helmet was wear by

International Journal of Research in Engineering, Science and Management
Volume-3, Issue-6, June-2020
www.ijresm.com | ISSN (Online): 2581-5792

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rider and alcohol was not consumed by rider) the vehicle will get started. Vibration sensor is present to detect the speed of the vehicle. GSM is used to send the messages to the registered mobile number.
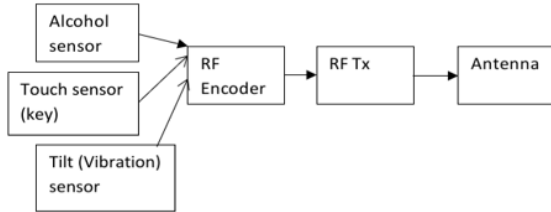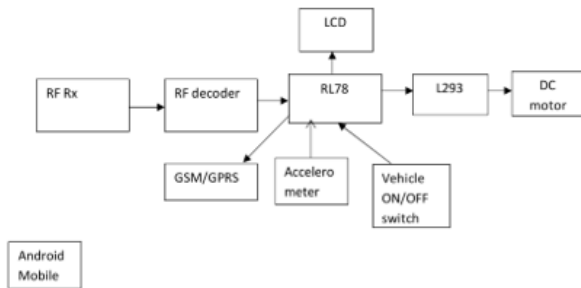

Fig 1. Helmet unit
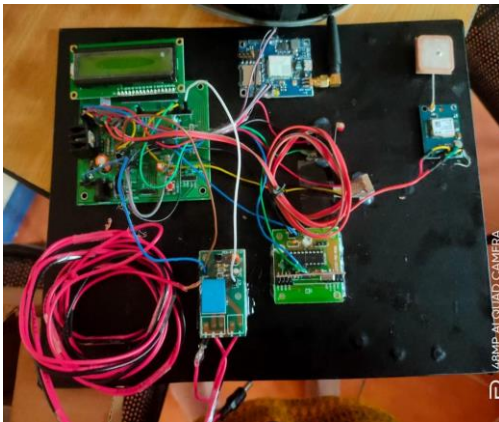

Fig. 2. Vehicle unit block diagram

4. Results

Fig. 3. Vehicle unit

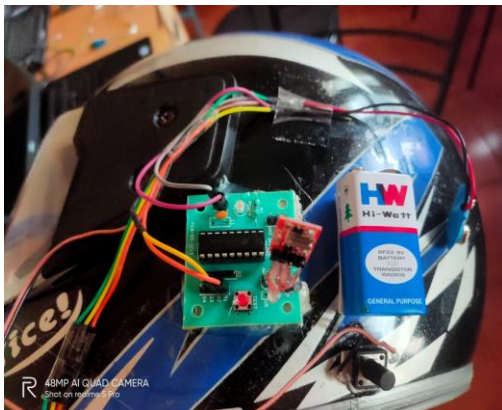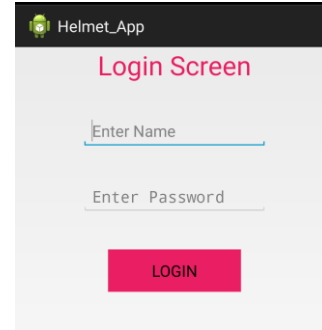
Fig. 4. Helmet unit

Fig. 5. Android Application when rider has lost /forgotten the helmet

5. Applications, Advantages and Future Enhancement

A. Applications

- It is less power consuming module.
- We can use this technology in other vehicles.

B. Advantages

- Easy to use.
- Efficient and reliable.
- It will reduce the accident rate.
- If we lose the helmet, we can start vehicle using android app.

C. Future enhancement

- Accident detection system such as GPRS for locating the accident spot and dialing the emergency number can be added.
- Solar panel can be implemented in helmet for power supply.

6. Conclusion

A module is designed in such a way that there is a communication between vehicle unit and helmet unit. This project ensures the safety of a rider. It makes sure that the helmet is made compulsory and thus avoidance of accidents. The main goal of this system is to provides an affordable safety system to the riders.

References

[1] Alexander, Lee and Max Donath, "Differential GPS based control of a heavy vehicle," in *IEEE/IEEJ/JSAI International conference on IEEE,* 1999.
[2] Rasli, Mohd, et. al., "Smart helmet with sensors for accident prevention," in *International conference on IEEE,* 2013.
[3] Prem Kumar M, Rajesh Bagrecha, "An IoT based Smart Helmet for Accident Detection and Notification", International e-Journal for Science and Research-2017.
[4] S. Chandran, S. Chandrasekar and N. E. Elizabeth, "Konnect: An Internet of Things (IoT) based smart helmet for accident detection and notification," *2016 IEEE Annual India Conference (INDICON), Bangalore,* 2016.
[5] Deekshitha K. J, Pushpalatha S, "Implementation of Smart Helmet," *International Research Journal of Engineering and Technology*, volume 4, Issue 7, July 2017.