

Survey on Smart Helmet System based on Internet of Things

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Abstract - Road accidents are increasing in our country day by day, most of them are caused because of the negligence of not wearing a helmet. By wearing the helmet, a lot of life's can be saved and severe injuries to the head can be prevented. Younger generation has developed a craze for speed which is another major cause for accidents. Drinking and riding is another reason for road accidents and it violates the traffic rules. Medical treatment has to be provided in time to the injured person to prevent loss of life and severe damage to them. Hence there is a need of a system which will ensure the safety of the motorcyclists, by making it mandatory to wear the helmet, prevent drink and drive scenario by the motorcyclists, prevent over speeding and also provide proper medical attention, after met with an accident by sending an alert to the concerned person.

Key Words: microcontroller, accelerometer, sensors, accident detection, alcohol detection, alerting.

1. INTRODUCTION

Most of the motorcyclists avoid wearing helmet without any specific reason. A lot of road mishap are caused due to over speeding, rash driving, drinking and riding the motorcycles. Due to the lack of experience or focus and violation of the traffic rules will lead to accidents. There are various reasons for accidents but the main reason was the absence of helmet on the rider which leads to serious injuries. Hence there is a necessity to find a way which will reduce the after effects of accident and will also reduce the number of accidents happening, so it is important to have a system which will minimize the after effects of these accidents. However, the main goal of our work is to make it mandatory for the rider to wear a helmet during the ride, to prevent drink and drive scenario and over speeding or rash riding by motorcyclists and also provide proper medical attention when met with accident by alerting the concerned person which will provide solutions to other major issues for accidents. The objectives of this project are

I. To design a helmet that provides safety to motorcyclist.

II. To prevent drink and ride.

III. To detect accident and alert the guardian.

IV. To prevent over speeding

2. LITERATURE SURVEY

1) Nitin Agarwal, Anshul Kumar Singh, Pushpender Pratap Singh, Rajesh Sahani, "SMART HELMET", International Research Journal of Engineering and Technology, Volume 2, issue 2, May 2015.

In this paper they introduce Smart Helmet System in order to avoid the accident. In the present generation accidents are the main issues, in which people are affected and might cause death. Usually bike accident occurs due to the people not wearing helmet and by ignoring the safety traffic rules. This control system is introduced to maintain the road safety of the bike riders. The system consists of RF transmitter and RF receiver. The bike ignition will not turn on without wearing helmet. Once the user wears the helmet the RF signal is passes from transmitter and RF signal is sensed by receiver. It senses the RF signal as the person wears the helmet. This system is applicable for many bikes and scooters and helps to protect life if met with accident and it will also reduce the number of people violating traffic rules.

2) Professor Chitte P.P., Salunke Akshay S., Thorat Aniruddha, N Bhosale, "Smart Helmet & Intelligent Bike System", International Research Journal of Engineering and Technology (IRJET) Volume: 03 Issue: 05, May-2016.

The smart helmet is protective system which provides safer ride to the bike rider. Smart helmet system is implemented with some advance features like accident detection, alcohol detection, location tracking, fall detection, it also makes use of the global system for mobile communication for sending alert messages. In this system it is compulsory to wear helmet, without wearing helmet the ignition will not be turned on and RF transmitter provides the wireless communication between bike unit and helmet unit. If the rider is drunk automatically the ignition will turn off, it sends message to the related registered number with the location. When the accident occurs, it sends the message with current location to the related registered number using global positioning system module.

3) Shoeb Ahmed Shabbeer, Merin Meleet "Smart helmet for accident detection and notification" 2nd IEEE

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This paper is about detecting an accident of two-wheeler using accelerometer and reporting it or give the notifications about the incident of accidents to the concerned authority and the relatives of the victim using the global positioning system module. This system makes use of hardware devices such as Arduino microcontroller, Accelerometer, GSM module, GPS module and web server. Accident is detected with the help of MPU6050 accelerometer it is a 6-axis accelerometer and gyroscope that detects the acceleration values with respect to positive and negative of the x, y, z axis and also the angle between them respectively. Consider, in the case when the bike is not yet started or remains stationary then the force which is applied on the bike will be zero because of acceleration due to gravity. When the rider is travelling on road and collision occurs to the back side of the bike then the acceleration increases or changes occur to the accelerometer and detects the accident. It occurs similarly when it is front collision or side collision. The angle is detected with respect to the ground and the helmet, if angle is high within a short period then it implies that accident has occurred. The location can be obtained by the Global positioning system module and decode the latitude and longitude values using National Marine Electronics Association string, location data and the type of the vehicle which connects the web server using Global system for mobile communication and sends the get request. Web server receive request and stores the data to the database along with the time of the accident and then the connection is close to the database and sends notification to the authority and relatives of the victims.

4) Jennifer William, Kaustubh Padwal, Nexon Samuel, Akshay Bawkar, Smita Rukhande "Intelligent Helmet" International Journals of Scientific & Engineering Research, Volume 7, Issue 3, March-2016

This paper aims at providing safety for rider by making necessary to wear helmet as per government guidelines, to detect alcohol consumption of the rider, accident detection and also to provide medical treatment at the correct time. To provide this type of measures the author has used two module Helmet module and Bike module. The helmet module consists of IR sensors, alcohol sensor, microcontroller, accelerometer and transmitter. IR sensor is the very sensitive it gives the low and high output value to check whether the helmet is worn or not (low- worn) (high- not worn). Alcohol sensor consists of some threshold value of the alcoholic concentration. When rider breathes, if he had consumed the alcohol greater than the threshold value then the bike doesn't start. Accelerometer

is used to detect the accidents that occurs. When the helmet is tilted so that the angle with respect to the ground is zero, then it implies that accident had occurred. The output of all these sensors are taken as the input to the microcontroller where it processes all the inputs and transmits the output to the bike section using RF transmitter over wireless network. In bike module, the RF receiver receives the output from the helmet section and provides to the microcontroller. This microcontroller is the decision making of the entire circuit. According to the input obtained from the receiver of the bike it controls other components that is when the IR sensor is low it implies that rider has worn the helmet then the bike starts smoothly else the bike ignition will not turn on. When the rider has consumed the alcohol, which is greater than the pre-set value then the bike will not start and also the accelerometer detects the tilting of the helmet with respect to the ground if the value is zero degree then the accident will be detected and an alert message will be sent to the nearby authority for the proper medical treatment.

3. APPLICATION

- Provides safe and secure ride.
- Useful for motorcyclists.
- Keeps check on over speeding.
- Prevents drink and drive among motorcyclists.
- Traffic rule violation is reduced.

4. RESULT

Smart helmet designed will ensure the safe journey of the rider. When the rider wears the helmet, the sensor detects it and gives an output based on which the ignition is turned off or on. The alcohol sensor checks for the alcohol content in the rider's breath, and the accelerometer is used to detect the accident by measuring the tilting of the helmet. The speedometer is used to monitor the speed of the motorcycle and prevent over speeding. The Microcontroller receives the output from all the sensors and processes the data and sends it to bike module via RF module which consisting of RF transmitter and RF receiver.

5. CONCLUSION

Smart Helmet provides safety to the rider, by making it mandatory to wear the helmet before riding the vehicle, and makes sure that the rider has not consumed alcohol. If any of the safety rules are violated, the system will prevent the biker from starting the bike. If over speeding is detected, the system will gradually decrease the speed of the vehicle. The system also helps in efficient handling of the aftereffect of accidents by sending a SMS with the location of the biker. This ensures that the victims get

proper and immediate medical attention, if met with an accident.

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