
“DESIGN AND IMPLEMENTATION OF HELMET FOR SPEED AND ALCOHOL DETECTION USING SENSORS”

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ABSTRACT: *The effect when a bike rider involves in an accident because of Carelessness of wearing a helmet is very dangerous and it can be result in increasing death ratio by road accidents. This paper will be designing a helmet with a some features to make it smart that normal helmet. Like for overspeeding detection purpose, alcohol detection, and detecting whether the person is wearing a helmet or not and sending the sms to the prestored number with the help of android application concept. The helmet involves an innovative concept which makes a two wheeler ride safer than before. This smart helmet involves the circuit which design in this manner if the person is not wearing a helmet and if he/she is drunk then the bike won't start. Some author discussed about the speed of the vehicle and whether the user is drunk or not .as soon as the Drunken user wear the helmet the alcohol in the breath of the Person will be detected. The main reason of accident is not only the person is driving without a helmet or driving in drunk. The system will basically comprise of a breath analyzing sensor, MQ5, which will sense the level of the alcohol in the breath. if the threshold value of speed of vehicle is exceeded then Sms will be sent to the relative or family members, that sms will provide the location of the victim using GPS system. The smart helmet will be many more other additional features developed by us in this paper.*

Keywords: GPS, Speed detection, Alcohol detection, Bluetooth Technology, MQ5, Arduino UNO ,Ultrasonic Sensor.

1. INTRODUCTION

The thought of developing this project comes to do some good for the accident prevention using helmet compulsion strategy to the rider of motorcycle. The project proposed work represents the helmet having some features like without wearing a helmet the bike can't start. Day by day the two wheeler accidents are increasing due to carelessness caused because of not wearing helmet. This projects involves a GPS system for the location detection of the victims, which gives the information of the accident location. The delay of getting help to the victims should be the reason of losing many lives because of the accident. The Overspeeding is the main reason of accident So ,to reduce that we will send the SMS to the numbers which can be set by own rider or it can be fixed in the coding part. As the speed exceeds rather than the speed limit. the Sms sent to that numbers .the Sms includes a link which provides the location where the overspeed is detected. this project proposed work consisting the sensors which is ultrasonic sensor and the MQ5 breath analyzer. The ultrasonic sensor senses the object under Certain distance at distance are set with the help of coding, that provide the

information about the helmet is wearing or not. Breath Analyzer detects that the driver is drunk or not. if the both conditions are satisfied then the bike status is show that bike is ON/OFF.

1.1 Problem Statement

ROAD accident is the major issue of taking a many lives every year .So, to reduce the count of death ratio of youngsters. The two wheelers are more prevalent in the small cities that bikes are easy to travelling in the heavy traffic also .many live are taken due to carelessness caused in wearing motorcycle helmets. Most of the people use helmets just to prevent from challan done by traffic control police not for the safety purposes. So, these helmets do not ensure the safety of the driver. For two -wheeler rider, Helmet act as a basic protection device. So, to overcome from this problem the smart helmet can be used.

1.2 Project Objectives

For the giving the safety purpose of the two wheeler Rider. The person who is driving a bike. In case of accident the

help will provide to the victims Earlier,so that life of the rider can be saved.To provide an information about the location of the victim to the Family members and the ambulance with the help of SMS .the project main objectives is that when the bike is overspeeding then the sms will sent so that the biker can control their speed and Ride within the speed limit.so, that there is no chance of accident and also we provide the helmet wearing compulsion for the safety purpose of rider. That will results in the death ratio of youngster by the road accidents will be reduced.

2. LITERATURE REVIEW

2.1 Speed Detection using Buzzer System

The Author has discussed accident prevention using speed detection with the help of buzzer system. The project has special idea which makes two wheeler ride safe than before, this is implemented using a buzzer alarm system.The buzzer usually goes on when the accelerometer gives some values beyond a specific limit which is set by the rider. For example, when the rider falls asleep or dozes off, making the accelerometer to pass abrupt values and make the buzzer go high. If alarm goes high that indicate the rider are not in steady condition or the speed of the vehicle is exceeds.

2.2 Alcohol Detection using Bluetooth Technology

The Author has discussed Alcohol Detection using Bluetooth. The Bluetooth is the bridge between the helmets And the android application.so, that the helmet can connect Through the smartphone via Bluetooth. The breath analyzer is used to sense the level of alcohol in the breath. That gives information that the user is drunk or not. That information is reflected to the application.

2.3 Smart Helmet using internet of things

The Internet of Things (IoT) is the term which is used for the Connection of any devices through the internet. So, that mutual communication can be possible over a network. So we have come up with this idea of IoT based smart helmet which ensures the safety of the rider while riding. The System of intelligent motor bike is used to inform the bike rider about the truck/bus which is near by the vehicle to avoid collisions of vehicles.

2.4 Smart Helmet based on microcontroller with GSM and GPRS system

The author has discussed in this paper related to the safety of the person while an accident was happned on the road.The aim of this proposed work is designed in this manner so that the information of accident should be send within a some earlier time so that the action are taken near by them instantly and that will help to save the life of the injured person. The system consisting of microcontroller for the centrally controlling of the system and the GSM is used for the calling or sending a sms purpose in the project and GRPS system is used for tracking a location. Their proposed system detects the accident and sends text message along with a voice message within a minute to the registered number.

3. PROPOSED SYSTEM

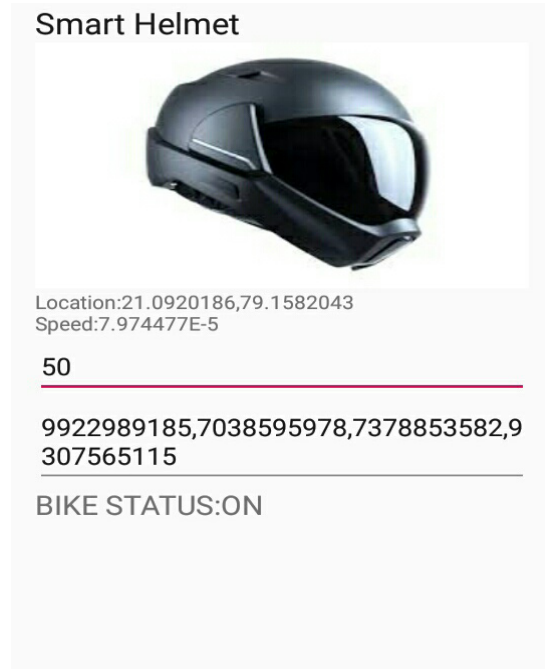


Figure 1: Implementation of Software Application.

3.1 Overview

The software application provides the location of the vehicle. Where the overspeeding is detected. The message is sent by that application to the prestored numbers. The speed of the vehicle is also detected. The software application provides the location of the vehicle.The application shows the bike status i.e. ON/OFF status. The speed of the vehicle can be set by the rider. The prestored number will be added by the user itself. If the user is wearing a helmet and user is not drunk,then the bike status is ON, otherwise the bike status shown as OFF in the Application.The proposed system involves a software part which is involves a java programming for the android application.

Application named as “Android Smart Helmet”.the application having a text box in which we can edit the numbers by own so that the sms will send on that numbers. Whenever the driver speed is set up by his own and when the speed will get exceeds.The message of overspeeding will be sent to the registered numbers.As the location is display in that application and speed is also seen in the application.

3.2 Architecture

This project will help to give the information of the accident to the ambulance or pre stored numbers. So, that we are using a smartphone which having inbuilt function of GSM technology to send the SMS . We are using GSM module, which has a SIM card slot to place the SIM card and send a SMS. Sending a SMS alone can't help the driver, if we send. In this project SMS will includes the location of the victim.For this we use GPS module to extract the location of the accident, the GPS data will contain the latitude and longitude values are used to find accurate position of the place of accident.

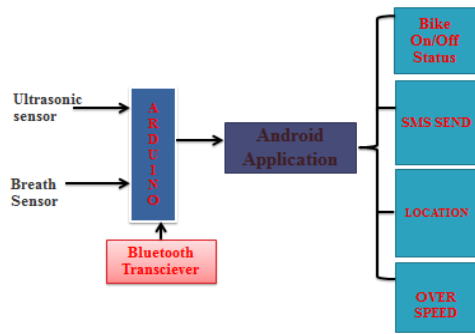


Figure 2: Architectural Diagram

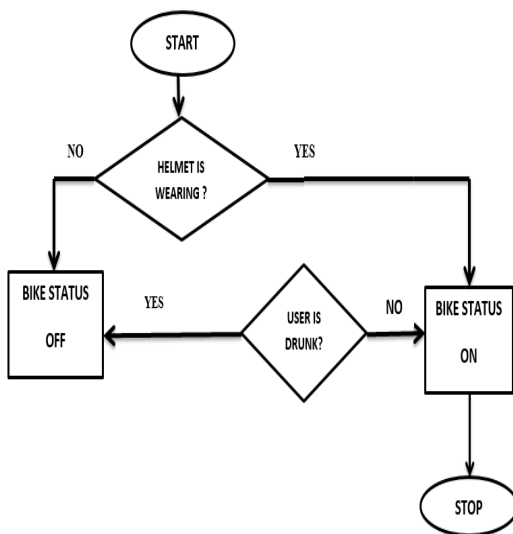


Fig.3.3 SYSTEM FLOWCHART OF HELMET AND BIKE MODULE

Figure 3: System flowchart of helmet

The system flowchart of helmet and bike module represents the helmet is wear by the rider or not. The ultrasonic sensor senses the object near by that, so it detects the person is wearing a helmet or not, and the breath analyzer senses the alcohol in the breath, that detects the person is drunk or not. If both conditions are satisfied then the bike status is shown as ON. Otherwise, the bike status is shown as OFF. Alcohol Gas sensor MQ6 is used for alcohol detection with some range of alcohol concentrations. Its conductivity increases as the concentration of alcohol gases increases.

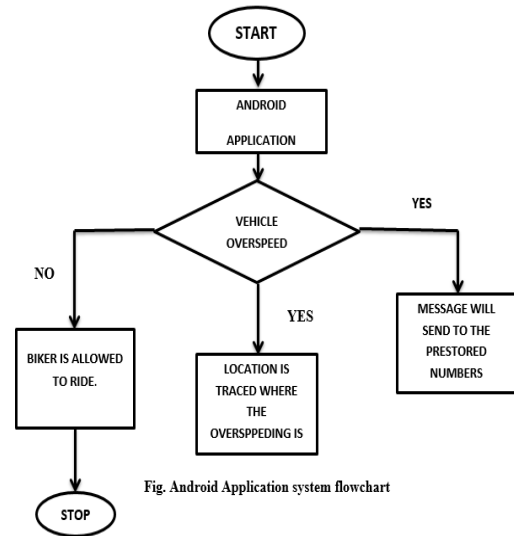


Fig. Android Application system flowchart

Figure 4: System Flowchart of Android Application

The software application provides the location of the vehicle. The message is sent by that application to the pre-stored numbers. The speed of the vehicle is also detected. The application shows the bike status i.e. ON/OFF status. Software application involves the android programming which shows the threshold value of speed. If the value of speed goes above threshold and then the SMS will send to the numbers given in the text box of application. We can add the numbers by our own, so that convenient to send the SMS and as the person wears a helmet and user is not drunk then the bike status shown as ON, otherwise OFF.

4. HOW IT WORKS?

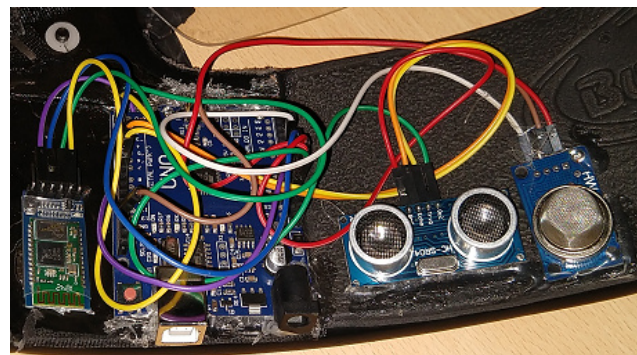


Figure 5: Hardware Mounting in Helmet

The project involves the hardware mounting in the helmet. The hardware involves HC-05 Bluetooth transceiver, MQ-6 Gas sensor, Ultrasonic sensor, Arduino Uno, interfacing cables. First of all, the power supply is provided to the hardware through a power bank. Then to connect the hardware with the software application, we should have to turn ON the Bluetooth from our smart phone.



Figure 6: Bluetooth Device ON

Now, the device is paired with HC-05 Bluetooth Transceiver to connect the application with Hardware.



Figure 7: Paired Device

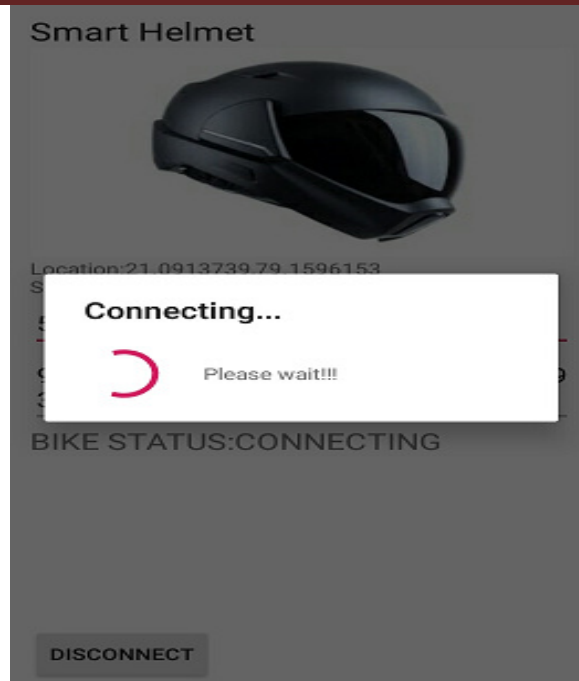


Figure 8: Connecting

Now, the device is connected with the Bluetooth so that the speed, and location will reflect in the application.

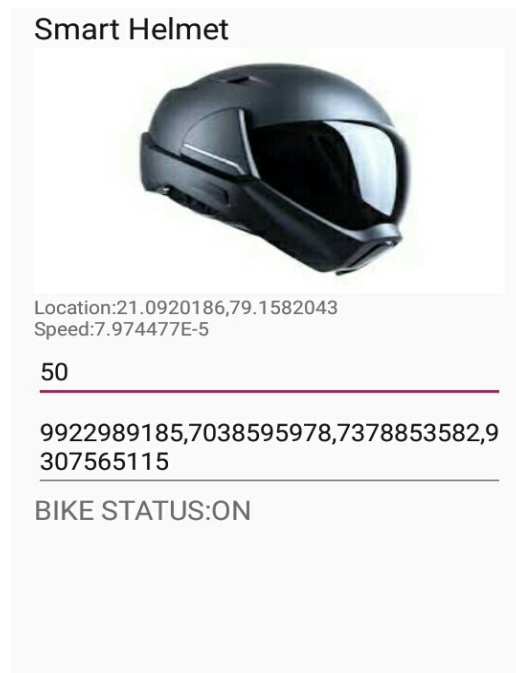


Figure 9: Bike Status

The application named as smart helmet will shows the bike status ON/OFF. There are two conditions to start the bike.

1. If a person will wear a helmet then the First condition is true with the help of ultrasonic Sensor.

2. If a person is not drunk then the second Condition is true, in which we are using Breath Analyzer to sense the alcohol in the breath.

Now, the person will start driving. When the speed of the vehicle is going above threshold value of speed then the sms will send to the numbers which can be add by own.the sms is send that includes the location where the overspeeding is detected.



Figure 10: Over speeding SMS by the application.

5. CONCLUSIONS

Nowaday's ,Many two wheeler accident leads to increasing death ratio in every year.In this our project is the effective solution to reduce accident which is caused by carelessness of the rider.so,the helmet wearing is compulsion for safety purpose.we had added new features to make it very useful. By implementing this system a safer and more secure two wheeler journey is possible.The accident tracker will track the location where the accident is caused and send the SMS to the Ambulance or the family members.so that the help will provide immediately to the victim.

6. REFERENCES

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