IJESC

Smart Helmet Using GSM Module

R.B.Sarooraj[1], Ajay Baskar.K.H[2], SaiNiveditha.R[3], Dhivakar.R[4]
Assistant Professor (S.G)[1]
Department of CSE
SRMIST, Ramapuram, India

Abstract:
Nowadays road accidents are increasing due to various reasons and some of the major reasons are not wearing helmet and Drunken Drive. In this project, to overcome the above problems we have implemented the physical devices, electronics and software in the normal helmet to improve the safety of the two-wheeler riders. This smart helmet consists of Position Sensor, Alcohol Sensor, PiezoElectric Sensor to detect the wearing of helmet, alcoholic content in rider's breathe and location ofthe accident respectively. In addition to this, we have included Global System for Mobile Communication (GSM) Module to monitor the location of the accident. It detects and sends the location of the accident to the pre-defined number so that the rider can be treated in time. Smart helmet reduces the rate of accidents.

Keywords: GSMmodule, sensors, microcontroller board, buzzer.

I. Introduction

A motorcycle's helmet is a type of protective headgear used by the motorcyclist. The main purpose is for safety, which is to protect the rider's head from the impact during an accident. It protects the rider's head as the helmet provides ventilation system. Speeding and not wearing a helmet are the main reasons of fatalities and injuries. It is proven that, as the speed of motorcycles increased, so did the number of accident and fatalities . This is again due to the shock of an impact during the accident.Motorcycles are the most common and easily available mode of transportation in India. With their ease in use there are many difficulties associated with the use of motorcycles, the most prominent among them are the road accidents. Accidents happen for various reasons like faulty motorcycles, lack of equipment, and improper use of motorcycle. In India 25% of all the road accidents that are motorcycle related end in the death of the driver. The basic reason for this is the untimely medical attention for the person. Considering three major factors for avoiding the accident causes such as make wearing the helmet compulsory, avoid drunk and drive and If a person met with an accident, no one is there to help him. Simply leaving or ignoring the person he may die. The idea of this work is to give information about the rider that he has met with an accident, it gives the information about location where the accident has happened.

This Smart helmet has two modules of operation i.e. one receiver part and one is transmitter part. The transmitter part is embedded in the helmet itself whereas receiver part can be installed in any particular bike. Thus, wireless communication takes place between two modules. In the transmitter module, pressure signal is sensed by pressure transducer which is situated inside the helmet. A comparator converts analog signal to digital signal and feeds as logic level 1 to the input of transmitter whereas transducer gives the output. When the user takes off the helmet then the output of transducer becomes zero and the input of the transmitter will get 0 as logic level. In the

receiver module, a high level digital output will obtained by the output pin till the rider wears the helmet and the ignition unit circuit of the bike will be completed when this signal actuates the digital relay. When the rider takes off the helmet the relay opens and the connections of the circuit will get terminated. Also, MQ-3 gas detector (alcohol sensor) is used to detect the alcohol content from the breath of the rider. It can be placed just below the face defend so that it can sense it easily. If the rider is drunk, then the resistance value drops which leads to the sudden change in voltage value. Then this value transfers to the microcontroller and it prevents from the ignition of the bike under this case
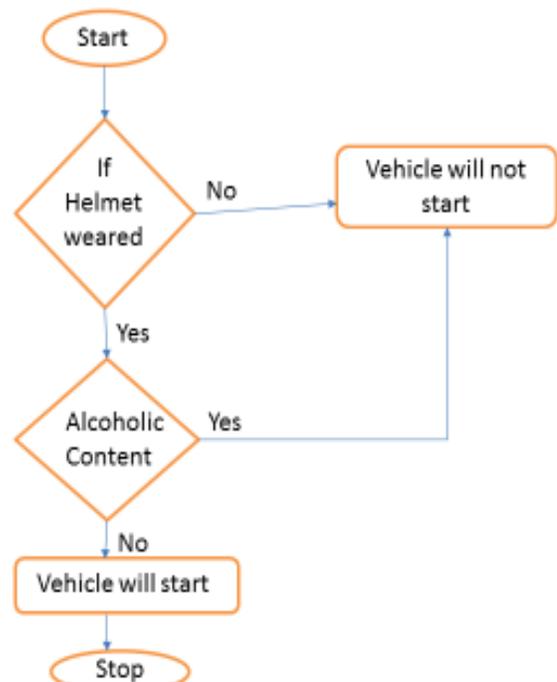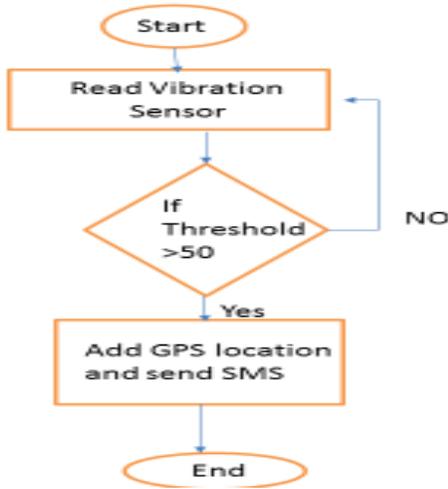

Fig. 1(A) Flow of process

Fig 1(B) Flow of Process

II. Problem Statement

Smart Helmet can be used in real time safety system. We can implement the whole circuit into small module later.Less power consuming safety system. This safety system technology can further be enhanced into four wheeler also by replacing the helmet with seat belt.The smart helmet system with advanced alcohol sensing including GSM and GPS Technology is used to authenticate with bike to unlock the ignition of the two-wheeler. The life of a rider on two wheelers can be saved from the road accident with standard protection with safety feature

III. Existing System

This is a report about a smart helmet which makes motor cycle driving safer than before. The main aim of this project is that it makes sure that the biker can't start the bike without wearing the helmet. A similar proposed work that has been put forward earlier which is based on the principle of pressure sensing that is wearing a helmet creates a pressure on the helmet and a data signal is passed to the transmitter which redirects the bike ignition control to turn on. Moreover the transmitter and the receiver modules used are IR based. However, both the technologies have certain drawbacks.
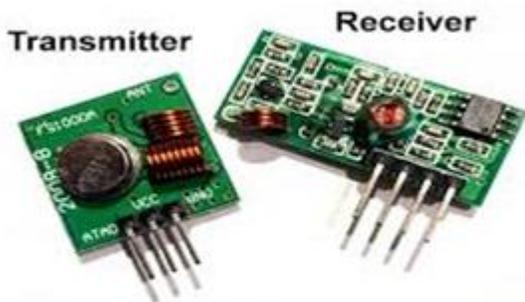

Fig. 2 FPV Transmitter and Receiver

IV. Proposed System

The idea of our work is that a biker must wear a helmet in order to start up his bike, otherwise the bike won't start. It also gives information about the location, in case, the biker meets an accident. The location of the accident is given by a **GSM module** to the cell phones of family and friends, through an **SMS**. Sending the **SMS** regarding the accident alone cannot help the rider until and unless the location of the accident is

also known. So as to trace out the location of an accident, we use a **GPS module**. Thus an **SMS** containing the information about the accident as well as the location (latitude and longitude) of the area is sent to the family and friends using a microcontroller
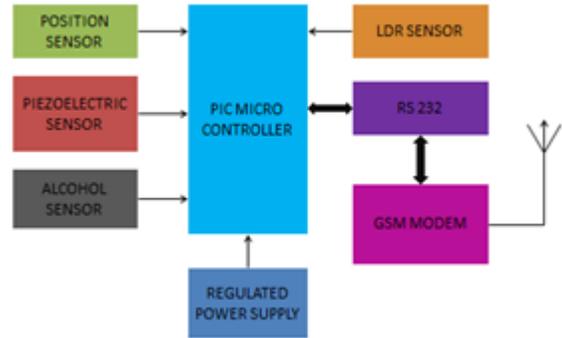

Fig. 3 Circuit overview

V. System Overview

A system which checks wearing of helmet with the help of **3 axis accelerometer** and if the rider is wearing the helmet system checks for content of alcohol in rider's breath using **alcohol sensor MQ3.** In case alcohol content is not detected, **PIC microcontroller** receives data from this sensor and gives data to RF transmitter. **RFtransmitter** will send this data to **RF receiver** which in turn runs the motor connected to it. If any of the above two conditions are violated motor will not work and it will be indicated by beep sound.A **Piezoelectric sensor** is used here to detect the accident which works on the principle of piezoelectricity. If the sensors output is stronger than certain threshold(0-5V) then the PIC microcontroller reads it as a crash.

A. GPS AND GSM MODULE

.The Global Positioning System (GPS) is a satellite-based navigation system which is used to detect the location where the accident will be taken place. It detects the Longitude and Latitude values of particular place and sends it to GSM module. It works in all weather conditions. It also helps to determine other units like speed, distance, time, etc. There are 3 pins of GPS module which is used in this project. Receiver pin of GPS is connected to the transmitter pin of GSM module and Transmitter pin of GPS is connected to the receiver pin of GSM module and 3rd pin is connected to Vcc.

Fig 5(a) GPS MODEM

B. GSM MODEM

GSM abbreviates as Global System for Mobile communication. It is used to establish connection between a computer and GSM system. It includes standard interfaces like RS232, USB, etc. The power supply circuit is also built in the module that can be activated by using a suitable adaptor. It costs around $20. It is used to send messages through the SIM.

Fig 5 (b) GSM MODEM

V. Future Research

The project can be enhanced by adding Google Glass Technology. Through this technology, biker can see the upcoming road before reaching that particular place. It can prevent biker from pits and pitiful condition of roads. Also, biker can see navigation on it and can alert him while taking sharp turns. Further, it can implement on cars also. People can use car seat belt to start ignition of car which can enhance the safety of the driver.

VI. Conclusion

This helmet can reduce number of road accidents that takes place every day. It ensures the safety of the biker as well as sends the victim's location to family members and nearby police station. Also, death rate can drastically be reduced by implementing this circuit as mandatory while driving and make everyone's life easier and smoother. This project represents an example of systematic approach to avoid the people from accidents. Thus only by wearing the helmet we can start the bike. By this we can avoid many accidents in this world, most of the accidents are occurring because of not wearing helmet, our government is introducing lot of rules to wear helmet but our people is not responding for that, so this is a better way to follow the rules to avoid accident and save the people from the heavy head injury.

VII. Reference

[1] Jennifer William, KaustubhPadwal, Nexon Samuel, AkshayBawkar, "Intelligent Helmet"International Journal of Scientific & Engineering Research, Volume 7, Issue 3, March-2016.

[2] Manjesh N, Prof. Sudarshan Ra1,"Smart Helmet & Intelligent Bike System" International Research Journal of Engineering and Technology (IRJET)Volume: 03 Issue: 05 | May-2016.

[3] HajerSalim, Malathi B. N, "Accident notification system by using two modem GPS and GSM" International Journal of Applied Information Systems (IJAIS) Foundation of Volume 8– No.3, February 2015.

[4]http://www.ijetcse.com/wpcontent/plugins/ijetcse/file/upload/docx/567ALCOHOL-DETECTION-USING-SMART-HELMET-SYSTEM-pdf.pdf

[5]http://www.academia.edu/6541133/Smart_helmet_iee_format

[6]https://www.asme.org/engineeringtopics/articles/manufacturing-design/engineering-safety-with-smart-helmets

[7]http://ijeetc.com/ijeetcadmin/upload/IJEETC_5561e8edcb13e.pdf

[8]http://esatjournals.net/ijret/2016v05/i05/IJRET20160505052.pdf