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Smart Helmet

Arpita Gupta[1], Divya Sharma[2], Priyanka Shamra[2], Divya Panwar[2], Sakshi[2]
[1]*(Associate Professor, EC Department,Krishna Engineering College/AKTU Lucknow, India)*
[2]*(under graduate students,EC Department,Krishna Engineering College/AKTU Lucknow, India)*

Abstract: *A helmet with smart features is very essential to make motorbike driving safer.This is implemented with the use of GSM technology. It is based on a simple principle with various sensors in it. Bump sensors are used to provide safety with jerks and hitting which is controlled by microcontroller board. The controller sends the data using the GSM module is interfaced to it. In this paper we discuss the helmet with accident detector. The transmitter and receiver are designed.*

I. Introduction

The novel idea would serve the society. Every day the two wheeler accidents are increasing and leads to loss of many lives. According to a survey there are around 703 accidents occurring due to bike crashes per year. It may occur due to many reasons such as no proper driving knowledge, no fitness of the bike, fast riding of bike, drunken and drive. Many times the person injured in the accident may not be directly responsible for the accident it may be fault of rider. If accidents are one issue then lack of treatment in right time is another reason for deaths. According to the survey India 698 accidents occur per year, nearly half the injured people die due to lack of treatment in proper time. Many reasons for this are: late arrival of ambulance, absences of pupil at the accident site to inform the family or to provide the victim with first aid [1].

To avoid accidents following measures are taken

I. Make wearing the helmet compulsory.
II. Avoid drunk and drive.

If a person meets with an accident, no one is there to help him and he is left behind to die. In such situation, informing to ambulance or family members through mobile to rescue him is necessary. This paper emphasizes on generating information about the rider wearing the helmet or not, whether the rider drunken or not and also, he met with an accident it gives an information about location where he is met with an accident through GSM module to mobile numbers family members by using GSM technology.

II. Material And Methods

With the advancement in the field of Technology human intervention is becoming less every day and robots are used widely for purpose of safety. In day to day life road accidents are very common and sometime it becomes very difficult for government to save human life. In such case smart helmet is very useful. This method has a GPS locator, which is used as the electronic device, and also a GSM modem, which is the latest technology used for communication between the mobile and the embedded devices [2,3].

OBJECTIVE OF PROJECT

♣ Programming of the mobile phone with AT (Attention) command sequence
♣ Interfacing the programmable chip
♣ Interfacing of the mobile phone with the programmable chip
♣ Sending messages from the GSM module to Mobile phones.

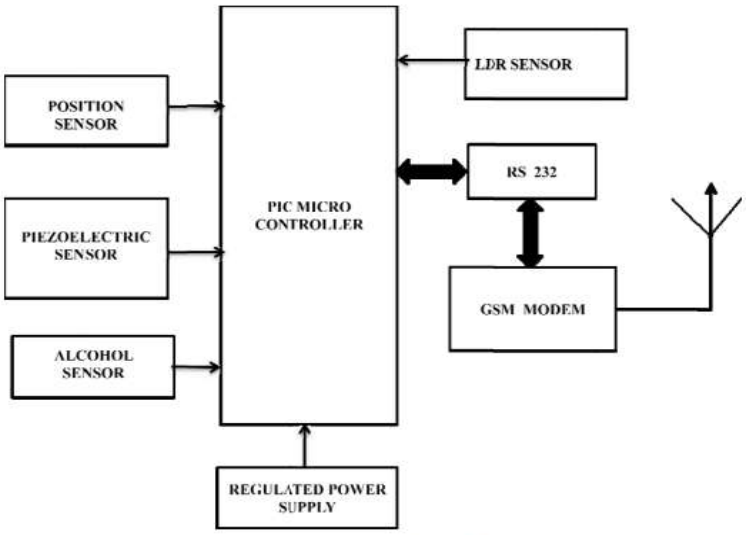

Fig1. Block Diagram of Intelligent Helmet System

Fig1 shows the block diagram of smart helmet. This system checks the two conditions before ignition of the engine. The first condition is whether the rider is wearing a helmet or not and it is detected by a position sensor. The second condition is detection of alcohol content in rider's breath with the help of an alcohol sensor. If any of the two or both the condition are violated then the bike will not start. If the rider is wearing the helmet and the alcohol content is not detected then ignition of engine starts.

In case if accident occurs then a piezoelectric sensor detects it and short message service is sent to the predefined number using GSM modem. If there is no accident then the vehicle reaches its destination. This system first checks wearing of helmet with the help of three axis accelerometer and if the rider is wearing the helmet system checks for the content of alcohol in rider breadth using an alcohol sensor MQ3. In case the alcohol content is not detected PIC microcontroller receive data from these sensor and gives digital data to the RF transmitter connected to it. RF transmitter will send this data to the RF receiver which is connected to the other pic microcontroller this in turn runs the motor connected to it. If any of the above two condition are violated motor which is connected to the pic microcontroller will not work and this will be indicated by a beep sound [4].

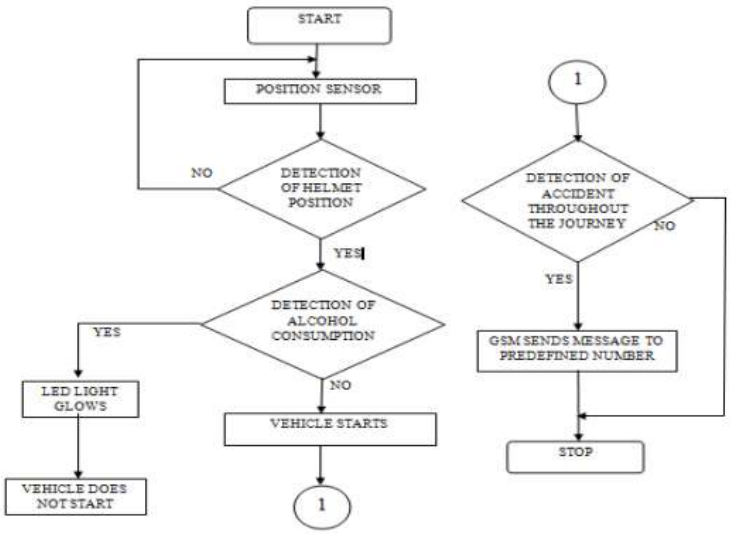

Fig2. Flow chart of intelligent helmet system

Fig 2 shows the flow chart of intelligent helmet system.This helmet works only when we switch on the DPDT switch in the transmitter. The DPDT switch is connected to the LCD display of the receiver .The LCD display shows the helmet is wearied or not by the person, the alcohol is consumed by the person or not, and the other display is of the accident sensor it shows whether the accident had occurred or not. When the DPDT switch is turned on then the LCD automatically turned on. When the person will wear the Helmet the helmet the DPDT switch inside the Helmet will get pressed which ensured on the LCD that the person had wear the helmet and the LCD display will show Helmet ”yes”. The other sensor named as alcohol sensor is connected in front side of the Helmet so that if the person has consumed an alcohol it will show on the LCD that Alcohol ”yes” if no then it will display alcohol ”NO”. The Molex is fitted in the receiver circuit which is connected to the spark plug of the bike so when the bike will start then by passing through the relay it will pass the signals. The other circuit named GSM module is connected along with the receiver circuit it is accompanied with the SIM slot along with the network which helps in sending message to the five fed contact numbers [5-7]. When the accident occurs then with the help of bump sensor the switch will get pressed and automatically with the help of GSM module and coding the message will be send to the five fed contact number. Fig 3 and Fig 4 shows the circuit diagram of transmitter and receiver.

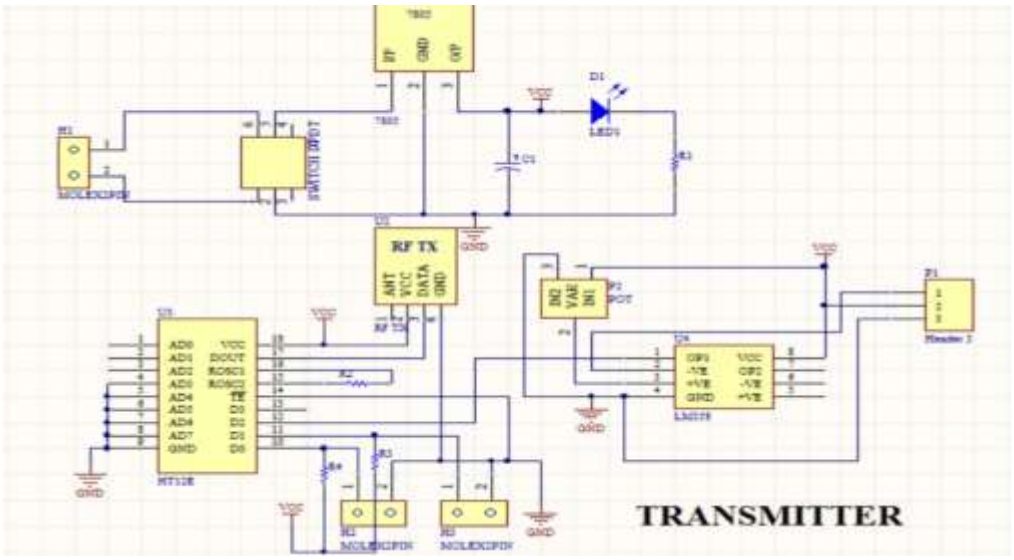

Fig 3: Circuit diagram of Transmitter

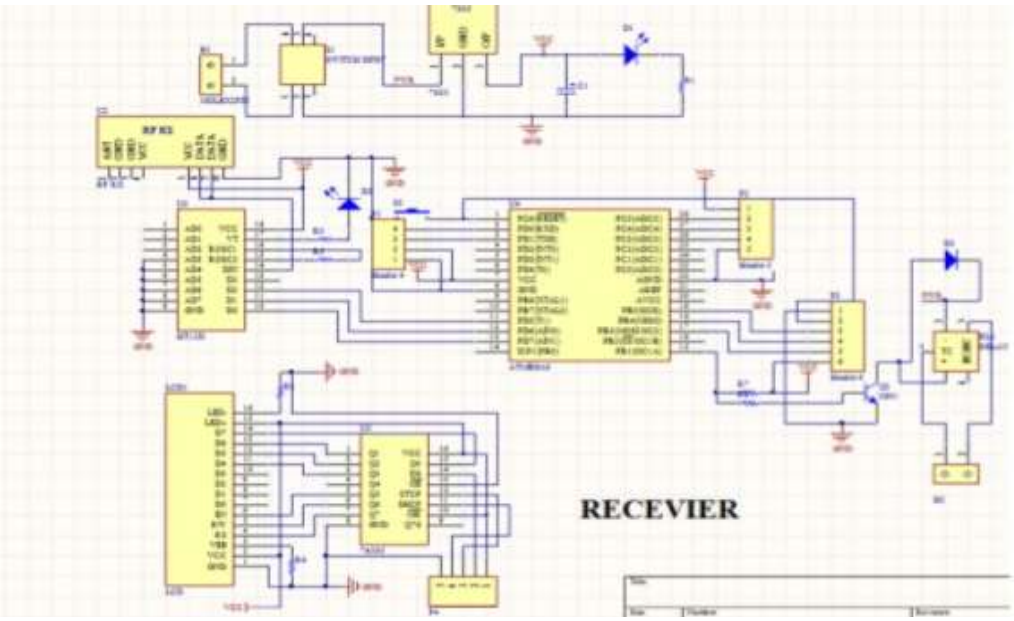

Fig 4: Circuit diagram of Receiver

III. Result

The smart helmet has a good real life scope. It can help to reduce lot of road accidents of two wheelers as it is the major cause of deaths in the whole world. It can also help to prevent the damage occurred to the vehicles by the accidents. So this helps in curbing the road accidents by implementing mandatory Helmet protection and detection of alcohol content during the starting on of the bike.

IV. Conclusion

The paper is emphasizing on the working of the smart helmet. In future if there is a large demand of this type of helmets we can manufacture the whole circuit in printed circuit board, so that circuit becomes smaller and can be easily fitted into helmet. The circuit can also be powered by solar energy so that it uses green energy and does no harm to environment .The flexible solar panels can fixed all along surface of helmet. This type of helmet technology can be implemented for the combat helmets used by the soldiers working under extreme temperature

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