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# Multipurpose Helmet used in Vehicle System

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***Abstract:*** ***As our country is a developing country. Even though we are developing in our technology and research, the death rate in road accident are increased every year. In India we are losing life of people is of about 382 every day especially in road accident. However the survey report says that most of the accident are due to alcohol consumption and carelessness in driving .These kinds of risks can be reduced by wearing the helmet such that our government also passed a law of wearing the helmet as mandatory during the ride. So as to avoid taking risk in accident a smart helmet was designed to make the helmet as a mandatory and also for detecting the alcohol consumption during ride. In this project an electronic device is embedded in both helmet and vehicle system. As a result the bike will start when the helmet is worn and there is no alcohol consumption. An obstacle sensor and vibration sensor are implemented in the vehicle system.IR proximity sensor is to alert the rider during the ride and piezeo electric sensor detect the vibration in case of accident and by receiving a particular vibration from the sensor, the controller command the GSM module to send the SMS to the riders relative immediately.***

***Keywords: GSM, ARDUINO UNO, Different Type of Sensor***.

## I. INTRODUCTION

Nowadays, the craze of bike among students is increased due to the introduction of new features and high speeding engine compared to olden days. All youngsters are interested to invest their money in buying two wheeler over four wheelers because of excitement in experiencing a new feature with their budget. Due to the high demand in bike, different sports company also invest huge amount of money in upgrading trends of bike to attract the youngsters. Now days, in a family each one have their own two wheelers according to their comfort abilities. Such that the bike on roads increase which automatically increase the traffic in our country. As a result, the road mishap also increased tremendously which lead to the increase death rate especially people who ride two wheelers. According to statistical report in accident around 1lakhs of people died due to accident out of that 33,000 people are two wheeler riders within one month. According to the survey of last year, the death rate of two wheelers is high compared to the four wheelers where 30% of death due to bike riders in India. World health organization provided a data that by wearing a helmet risk of injury in head can be reduced by 78% and 39%of death risk can be decreased. System proposed that by using GPS/GSM module, message can be sent about the accident to the nearby ambulance or family members or police station. In order to prevent the head injurious we are suggesting to add a smart helmet system and vehicle system to make the two wheeler to have a happy and secure journey In this paper, it include simulation of device and hardware part comprise of GSM/GPS module, LCD(16*2),arduino uno and different type of required sensor. Software is used to interface the elements with each other. The main motive of the project is to provide a protective ride and also to decrease the death rate

## II. OBJECTIVE

*A.* To design a helmet to detect of alcohol consumption and lock.
*B.* To design a circuit in order to alert the rider about the obstacle near to the bike.
*C.* To design a circuit to send SMS when accident occurs.

## III. PROPOSED SYSTEM

This project is mainly done to reduce the death rate due to head injury during accident. While driving in two wheeler as precaution, helmet is to be worn by the person in order to escape from the head injurious in case of accident. In our system, we have enhanced the normal helmet to a smart helmet. In helmet we have embedded with belt detection and alcohol detection. The device in the helmet initially checks the alcohol and then detect the belt lock. The helmet lock prevent the head injury in case of accident where head is an important part in our body because all nervous are connected to the brain if one nerve system got damaged due to small accident it affect the whole body control system. When the arduino receives the input signal from both alcohol and belt sensor it will send the data through the RF transmitter from helmet. The RF receiver in vehicle module receives the signal transmitted from

the transmitting in helmet .after getting the information the bike will start. In additional to this an obstacle sensor is embedded in vehicle to alert the rider before the accident occurs. If the rider meets a mishap the piezeo sensor passes the signal to the microcontroller. The buzzer starts sounding once the vehicle collides with obstacle, as the sensor detects some vibration. If the vibration is beyond the range which is coded then, the system automatically send the information about the accident to the relative of the ride or to the police station.

## IV. ACQUIRING IMAGES USING IMAQ TOOLS

The helmet comes with two modules i.e. one receiver and one transmitter. The transmitter being embedded in the helmet, and the receiver module can be installed on any bike. At the transmitter end, the helmet consists of a limit switch and a gas sensor.

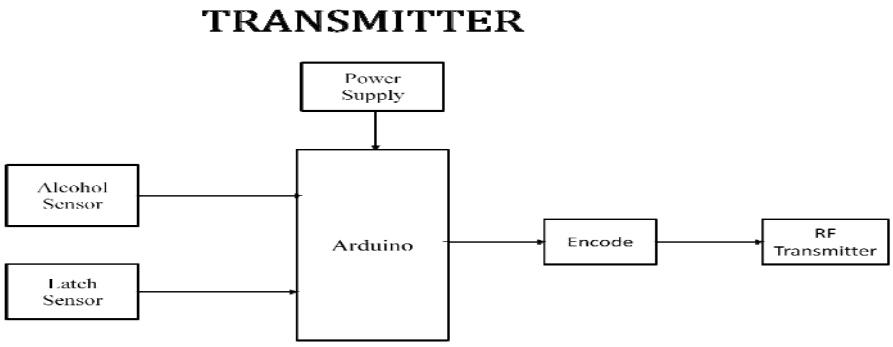


Fig 1 Proposed system block diagram-transmitter

Transmitter section consist of gas sensor and latch sensor with RF transmitter module. A limit of switch operator by the motion of a machine part or either the presence of an object. They are used for controlling machinery as a safety interlocks as a part of a control system. Limit switch act as an electromechanical device that consists of an actuator mechanically linked to a set of contacts. When an object comes into contact with the actuator the device operate to contacts are make to break an electrical connection. An alcohol sensor with an arduino.MQ-3sensor is used. This is a sensor that is not only sensitive to alcohol particularly ethanol which is the type of alcohol which is found in wine, beer and liquor. This type of sensor circuit can be used as a Breathalyzer to check a person's blood alcohol level. Just as we exhale carbon dioxide when we breathe out we also will breathe out some alcohol if we have alcohol in our blood any lactometer device can measure this alcohol content. To connections the sensor there are 4leads.2 of them are for power. The +5 terminal of the sensor connects into the 5v terminal of the ardunio board. The GND terminal of the sensor connects into the GND terminal of the ardunio. This establishes power for the sensor. The other 2 connections are the analog and digital output of the sensor. These connect to analog pin A0 and digital pin D8 respectively. When the Arduino receives the input signal from both alcohol and belt sensor it will intimate the RF transmitter. These signals are then rectified and checked according to information stored in the encoder. The encoded signals will then transmit the necessary actions to be performed by the RF transmitter. Rf transmitter encodes the information given by the Arduino and send to the transmitter antenna.

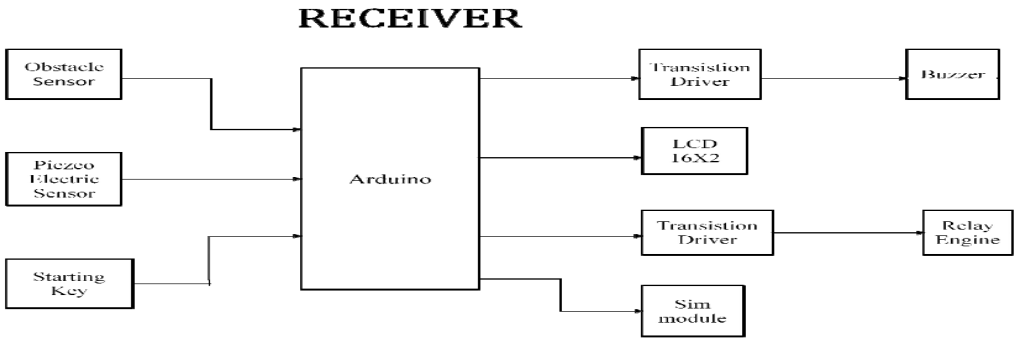


Fig 2 Proposed system block diagram-receiver

In this section we have a Decoder, RF Receiver, Microcontroller (ARDUINO UNO), 16x2LCD, GSM Modem, GPS Receiver, Buzzer, Relay, motor, IR proximity sensor and immobilizer. ARDUINO UNO controls and co-ordinate the overall operation of the system. The RF receiver module receives the signal transmitted from the transmitting unit. It consist of 8 pins namely three ground pins, two VCC pins, two pins for data o/p(One for digital data and another for linear data) and the ant pin(receiving i/p).In simple terms, HT12D converts the serial input into parallel outputs. It decodes the serial addresses and data received by, say, an RF receiver, into parallel data and sends them to output data pins. The serial input data is compared with the local addresses three times continuously.

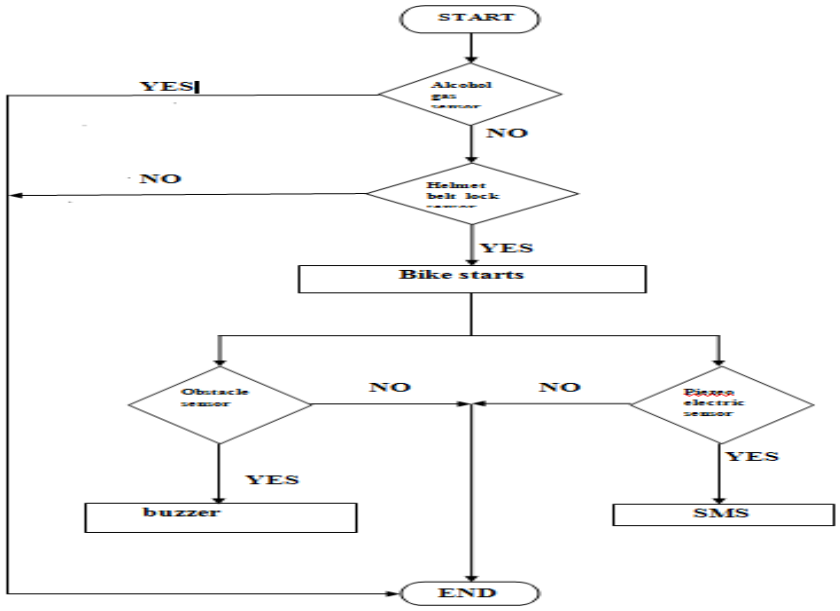


Fig 3 Flow chart representation of proposed system

The input data code is decoded when no error or unmatched codes are found. Valid transmissions in indicated by a high signal at VT pin and then relay goes on. A string of address and data bit is used to prevent from false triggering. RF receiver module is crystal lock frequency receiver which maintains a constant frequency.If the rider meets a mishap the piezeo sensor passes the signal to the microcontroller. The buzzer starts sounding once the vehicle collides with obstacle, as the sensor detects some vibrations. If the mishap is just a normal, then no mgs will be sent, or when the rider is met serious accident then the vibration will be high then the microcontroller will sends the information of the rider to the rider's relatives through GSM. A GSM modem is a specialized type of modem which accepts a SIM card, and operates over a subscription to a mobile operator, just like a mobile phone which has been saved in the system.

## V. RESULTS AND DISCUSSIONS

Figure 4 Helmet Detection section

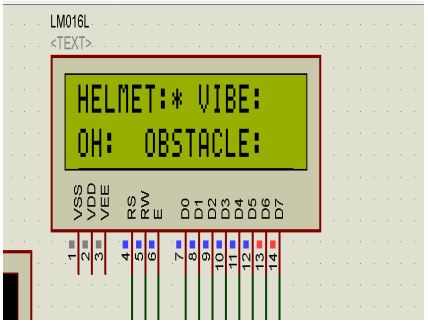


Figure 5 Helmet display

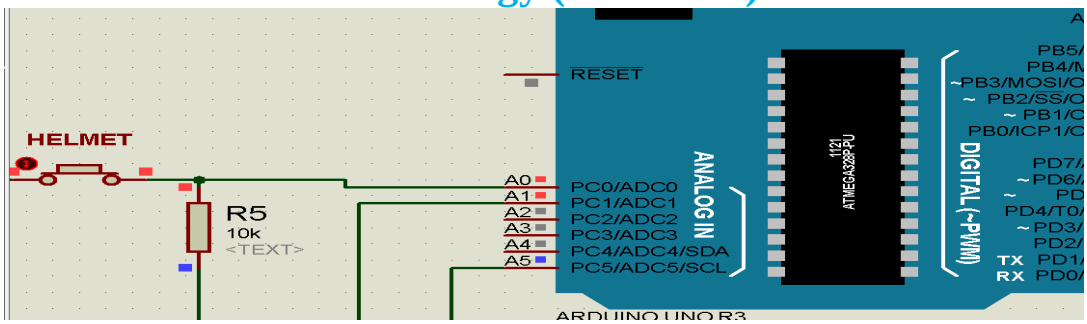

Figure 6 Simulation part of helmet belt

When the helmet is worn by the rider it will be indicate by the * notation in the LCD. When the alcohol is not consumed by the rider, it will be indicated as a empty cursor in the LCD. If both condition is satisfied then only the bike starts .If any one condition is false then the rider cannot run the vehicle.

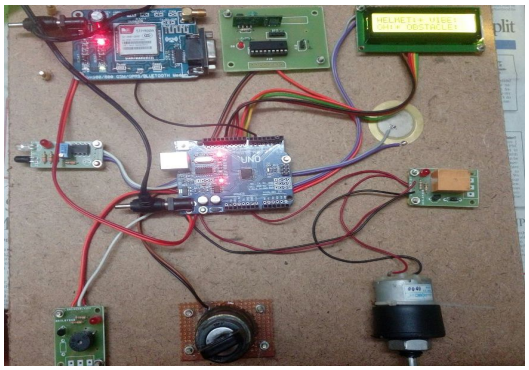
Fig7. hardware part of vehicle section

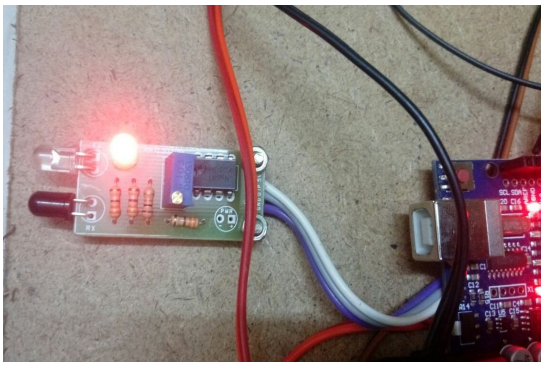
Fig 8. Obstacle sensor

Before getting mishap with the other vehicle, an obstacle sensor embedded in the vehicle system to alert the rider about the obstacle in their path. Unexpected if the accident occurs then by measuring the vibration experienced in vehicle the GPS/GSM module sent SMS to the police or relative of the rider.

## . VI. CONCLUSION

This system was designed majorly to avoid motor bike accident. The accidents are increased majorly due to absence of helmet or the usage of alcoholic drinks so the major objective of this system is to develop an electronic smart helmet system. This system sequent checking the helmet wearing and drunken driving. By implementing this system we can reduce head injuries occur offently. Along with that this system provides obstacle alert system and SMS sending system in case of accident occurs. By this project riding two wheeler become more safe able and securable. Such that the rider can get a safe journey along with their vehicle. It helps the driver to control vehicle easily. And it is most economical and easy to use. So it has good social aspects.

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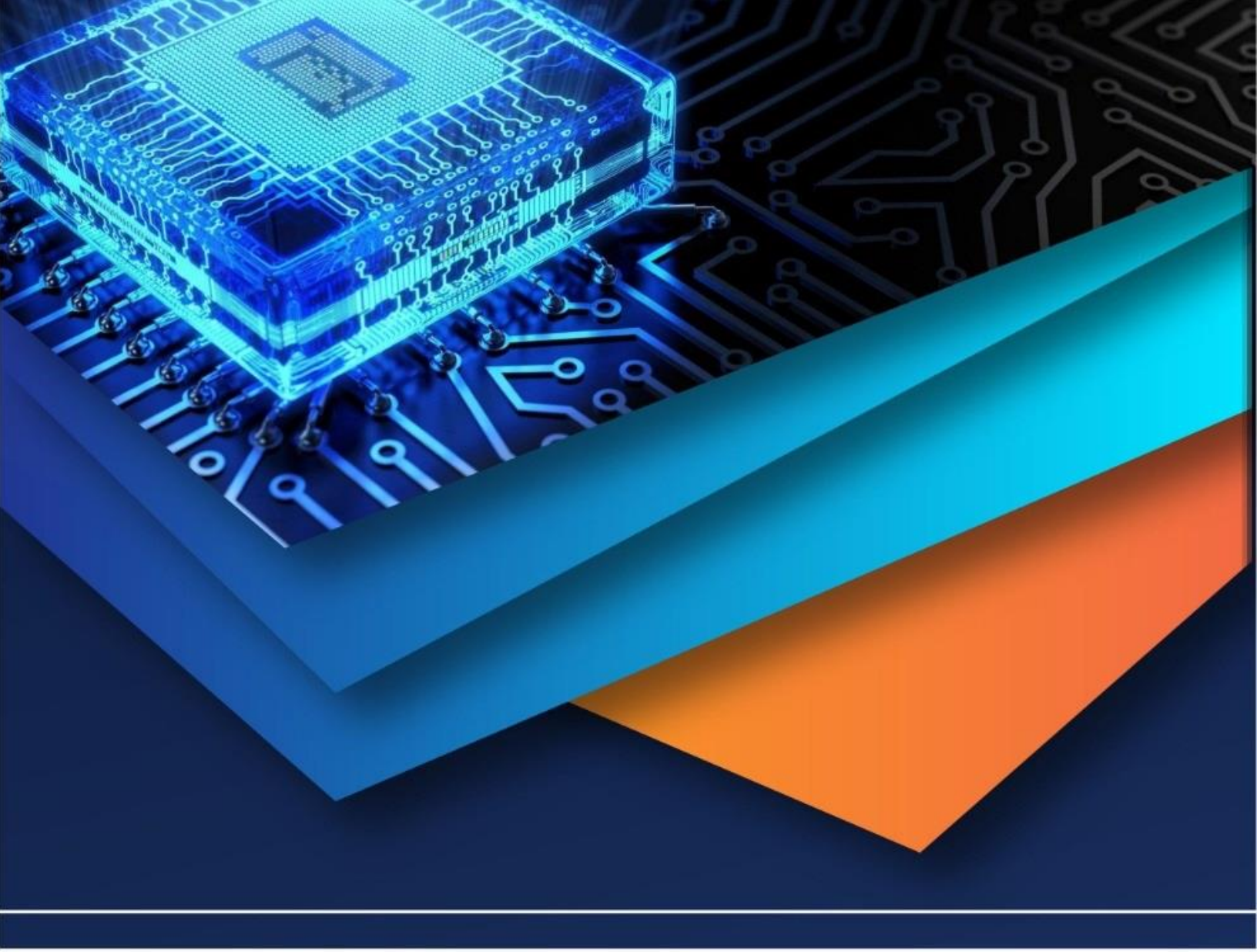

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