

SMART HELMET

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Abstract— An accident is a specific, unexpected, unusual and unintended external action which occurs in a particular time and place, with no apparent and deliberate cause but with marked effects. Carelessness of the driver is the major factor of such accidents. The traffic authorities give a lot of instructions to the vehicle operators. But many of them do not obey the rules. Nowadays most of the countries are forcing the motor riders to wear the helmet and not to use the vehicles when the person is in drunken condition. But still the rules are being violated by the users. In order to overcome this we introduces an intelligent system, Smart Helmet, which automatically checks whether the person is wearing the helmet and has non- alcoholic breath while driving. Here we have a transmitter at the helmet and the receiver at the bike. There is a switch used to sure the wearing of helmet on the head. The ON condition of the switch ensures the placing of the helmet in proper manner. An alcohol sensor is placed near to the mouth of the driver in the helmet to detect the presence of alcohol. The engine should not ON if any of the two conditions is violated. When the rider crashes and the helmet hits the ground, the sensors sense and gives to the arm controller board, then controller extract GPS data using the GPS module that is interfaced to it. When the data exceeds minimum stress limit then GSM module automatically sends message to ambulance or family members.

Index Terms— Accident, Drunken Driving, Helmet, Intelligent system, Safety, Sensor, Vehicle.

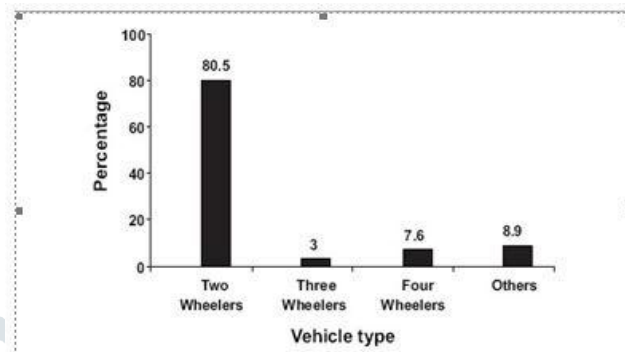


Fig.a

Helmets acts as a basic protection for two-wheeler rider. But it does not ensure that the rider strictly follows traffic rules. The major percentage of two wheeler accidents is due to violation of traffic rules by the riders. This was found out in our literature survey conducted on the internet and the statistics are as stated in the following fig.b.

Causes of road accidents	%
Fault of the driver	78.5
Fault of the pedestrian	02.2
Defect of motor cycle	01.8
Defect of the road	01.3
Fault of the cyclist	01.2
Weather condition	00.8
All other causes	14.2

fig.b

I. INTRODUCTION

Application of electronics in the automobile field is very much popular now. Because of the low prices and various varieties available in the market people prefer motorbikes to buy over 4 wheelers. Hence Road Safety becomes a major issue of concern. Therefore it becomes necessary to implement such a technique which is not easy to bypass the basic rule of wearing helmet and to avoid drunken driving. The idea of this work is to give 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, so I have chosen GSM technology to give the information by sending SMS, using GSM module which has SIM card slot to place the SIM and send SMS. Sending SMS alone can't help the driver, if we send and an SMS saying that accident had occurred where the ambulance will come without knowing the location of the accident. So to trace out the location where exactly accident occur using GPS module, and gives to micro controller, then it sends the SMS which contains the latitude and longitude of a area to family members mobile numbers For this we use GPS module to extract the location of the accident, the GPS data will contain the latitude and longitude values using which we can find the accurate position of the accident place.

II. LITERATURE SURVEY

Statistics suggest that most of the road accidents that take place are that of two wheelers viz. Motor-bikes and scooters

To ensure that the rider is not drunk breath analyzer is installed in some high end vehicles or the vehicles have to stop and the rider needs to give the test to the Traffic police. Vehicle tracking systems which use GPS [3] are installed in high end vehicles only and a very few vehicles have the feature of sending SMS using GSM module in times of emergency.

The latter two points ensure safety only in high end four wheelers, but this can be extended at a nominal cost to ensure safety and proper help in two-wheelers also. As known to us the above stated reasons are major cause of road accidents.

So we have decided to include all these features in the two wheelers to ensure the proper following of traffic rule and in case of any accident message will be sent to police control room with the help of GSM module [3]. Also feature of abort switch is included using which the rider can abort message sending in case of minor accident.

III. PROPOSED SYSTEM

MQ-3 gas detector (alcohol sensor) is suitable for detecting alcohol content from the breath. So it can be placed just below the face defend and above the additional face protection. The surface of the sensor is sensitive to various alcoholic concentrations. It detects the alcohol from the rider's breath; the resistance value drops leads to change in voltage (Temperature variation occurs). Generally the illegal consumption of alcohol during driving is 0.08mg/L as per the government act. Threshold will be adjusted mistreatment exploitation. So the wearing of helmet is confirmed by alcohol

sensor fitted in the mouth piece of the helmet detects the alcohol within the breath and sends the amount of alcohol to the RIO. If of the criteria is met in an appropriate manner then the signals are sent from the helmet unit to the vehicle control unit using RF module. The decoded RF signal is distributed to the RIO within the vehicle unit two to start up / stop the vehicle. If the signal from alcohol sensor is not detected then the vehicle can begin, otherwise the vehicle won't begin.

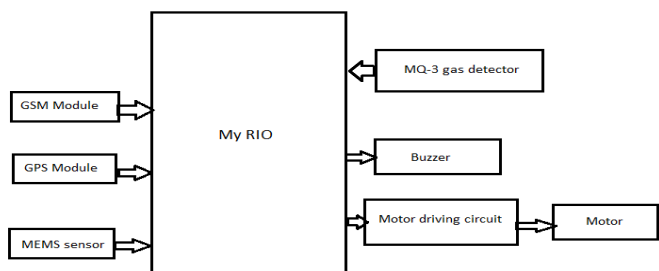


Fig.c

A smart helmet is a special idea which makes motorcycle driving safer than before; this is implemented using GSM and GPS technology. The working of this smart helmet is very simple, helmet hit the ground, these sensors sense and gives to the RIO, then GPS extracts the data using the GPS module that is interfaced to it. When the data exceeds minimum stress limit then GSM module automatically sends message to ambulance and family members. fig.c shows the block diagram of the proposed system.

IV. METHODOLOGY

The fig.d shows the manner in which the circuit is implemented in the inner shell of the helmet. The alcohol sensor, array of micro-switch, AND-gate, HT12E and RF-Tx are the blocks that are fitted in the helmet. The second part consisting of HT12D, RF-Rx, accident detection sensor, GSM modem (SIM300) and GPS is used for tracking the location of accident.

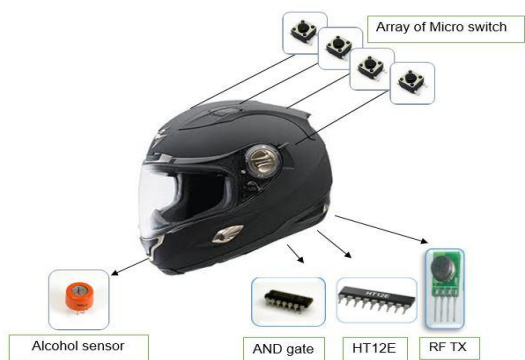


fig.d

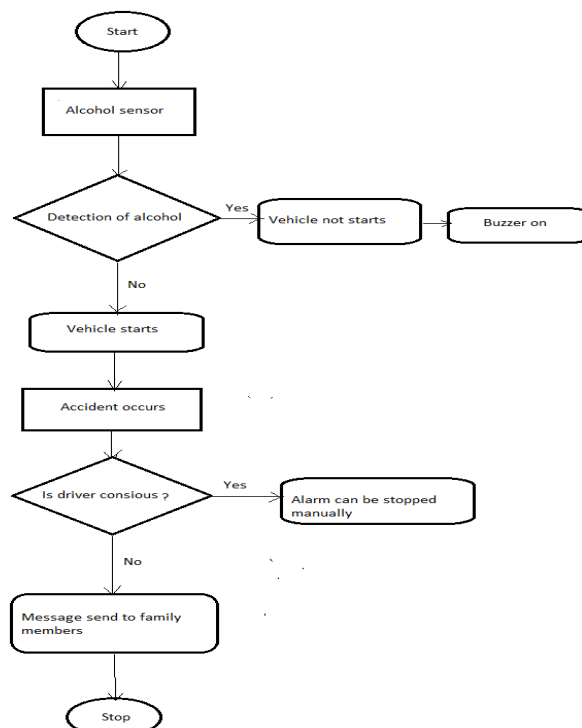
V. FLOWCHART

The flowchart shows the pictorial representation of the system if the rider is alcoholic in his breath in such case the information passes from the RF transmitter then the data is received by the RF receiver to the RIO. Then MQ-3 gas detector (Alcohol sensor) gets activated and the DC motor gets turned off and the beep sound is made, otherwise the motor runs continuously.

If the rider is met with an accident, then the MEMS sensor is activated and passes the information from RF transmitter to RF receiver which is placed in the bike. In this case SMS is sent to the family members and nearby hospitals through GSM module.

GPS technology is used for tracking the exact location of the place or area where the accident has occurred.

The exact locations latitude and longitude values are sent via SMS.



VI. CONCLUSION

The present situation in our country is that we are not using this type of Helmet. To reduce the manual efforts and human errors, we need to have some kind of automated system monitoring all the parameters and the functioning of the connections between the two wheeler and the parents. It makes the motor vehicle driving safer than before.

VII. FUTURE SCOPE

1. The circuit can be interfaced with GPS to get the exact location of the biker when an accident occurs.
2. Our project can be further implemented with a jammer in the helmet; jammer will prevent any call to be attended while driving.
3. A speed limiter can be interfaced so as to restrict driving at high speed.
4. In case of theft, vehicle can be identified easily because of its unique identification.

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