

A Novel Approach to Implement SmartHelmet System: A Review

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ABSTRACT

Due to enlargement of constant population growth, steep rise of number of vehicles can be seen. For this reason, numbers of accidents are also happened exponentially. The main reasons for road accidents are violating traffic rules, reckless driving, drunken driving, usage of mobile phones while driving etc. But more than 70% drivers have to face, severe accidents for not wearing the helmet which causes severe head injury and death. To resolve this problem, we are developing this project which is named as Smart Helmet. The motto of our project is to design a low-cost smart helmet which can be able to identify the alcohol consumption of the rider and prevent road accidents.

Keywords: Accidents, Alcohol sensor, GSM module, Helmet.

1. INTRODUCTION

Now a day, most of the accidents happen due to drunken driving and reckless driving. Most of the countries are forcing the riders to wear a helmet for safety purpose. Still some people are violating the rule and accident takes place. Thus the objective of this project is to make sure people wear helmets and then ride bikes [1]. Another purpose of this project is to confirm that the rider is not drunk. The rider cannot be able to ride the bike if he is drunk. The most important thing of this project is to reduce the number of accidents by sending the message to the riders' relative of the accident. Advance features like alcohol detection, accident identification are implemented in this project. So, helmet wearing is mandatory, without helmet ignition switch cannot ON.

2. LITERATURE SURVEY

Most of the accidents can be taken place in two wheelers like motorbike and scooter. The riders, who drive their vehicles without wearing the helmets, face the accidents mostly. Helmet is the basic protection of the riders. But it does not ensure that the rider strictly follows traffic rules. So to overcome these problem this helmet is been designed. The middle class families prefer to buy motor bike over four wheelers, because of the low prices, various varieties available in the market [1]. Main causes of road accidents are given below

1. Over-speeding or driving in excess of prescribed speed limits.
2. Not wearing helmets or not using seat belts - more than 80% of road accident deaths are due to the head injuries.
3. Drunken driving or driving under the influence of drugs.
4. Over loading of vehicles.

5. Use of mobile phones or ear phones while driving/crossing the road.
6. Violation of road signs, signals, traffic lights and road safety rules or many a time due to their ignorance.
7. Long hours of drive, tiredness and fatigue of the driver and lack of traffic education.
8. Pedestrian negligence also contributes to road accidents and endangers their own lives[2]

As per the current statistics, total no. of 3, 66,138 road accidents occurred in India during 2020, where drunk driving led to 8,355 road accidents. So, in this project alcohol sensor is attached to ensure the presence of alcohol in rider's breath.

3. PROPOSED SYSTEM

Methodology

MQ-3 gas detector (alcohol sensor) is an important part of this project. It can be able to detect alcohol content from the breath of the rider. So it can be situated just below the face defend and above the additional face protection in the helmet. 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 [3]. If the signal from alcohol sensor is not detected then the vehicle can begin, otherwise the vehicle won't begin.



Figure 1: Smart Helmet



Figure 2: Basic circuitry of smart helmet

Flowchart

The above mentioned flowchart shows the pictorial representation of the system..If the rider is alcoholic in his breath then the signal will pass from the RF transmitter and the data is received by the RF receiver to the RIO. Next MQ-3 gas detector (Alcohol sensor) will be activated and the DC motor gets turned off and finally 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 [3].

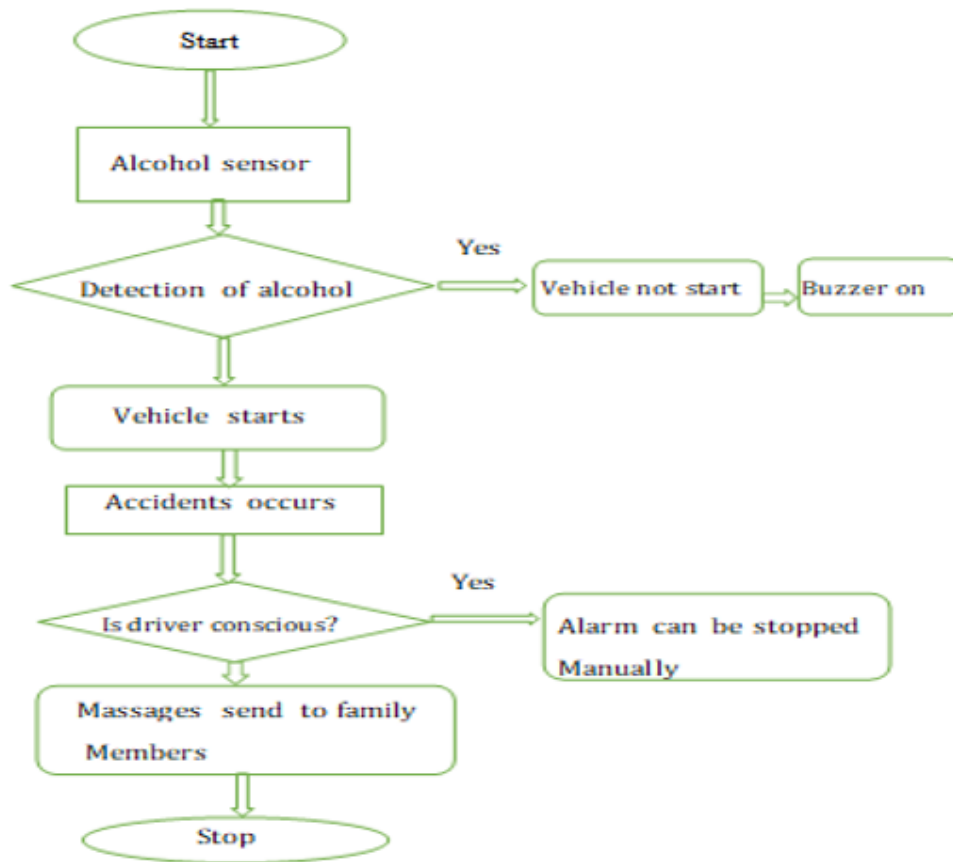


Figure 3: Flow chart of the proposed system

4. FUTURE SCOPE

The proposed system introduces a smart helmet system which is very beneficial to the rider. The existing system is for alcohol detection and when an accident occurs the accident status. There is an auto ignition system in this proposed method which finalizes that the rider wears the helmet or not and also detects the presence of alcohol contents. In future improvements can be done by using solar system with multi features.

5. CONCLUSION

By reviewing all the papers, we came to know and conclude that the smart helmet system should be very effective and indispensable for providing safety for the biker. By using different mechanisms; it will protect the rider from accident and provide safety too. Just take one step forward by the society that is wearing the smart helmet while driving the bike.

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