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Smart Helmet for Accident Detection

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Abstract: ***Now a days, many people are prefer to ride a bike than a car. And we also seen that most of the accidents are occurred to those people who rides the bike only. We observed that no special advantages are inserted in the bikes to reduce these accidents. Now days, the government made it mandatory to wear a helmet, otherwise fines are to be collected. So we made a project on helmet that prevents the rider from accidents. The LED glows only when the rider wears the helmet, it means the bike starts only when the rider wears the helmet, otherwise the bike can't starts. If the rider consume alcohol, the alcohol detector detects the alcohol range and stops the bike engine and it is indicated by LED. The vibration sensor inside the helmet sense the vibrations, when the rider falls off from the bike and immediately sends SMS to the family members and police stations.***

I. INTRODUCTION

This paper mainly aims to reduce the fatal accidents that is caused by those who are irresponsible of wearing a helmet while driving. On one survey , these accidents are mainly occurred during the weekends as the employees who are working in reputated companies celebrate parties and consumes a lot of alcohol without any thoughts. Simply went to their house by driving a bike without wearing helmet. So, because of these ignorance many people lost their beautiful lives.

So we made a project to save their lives and to make them responsible. We insert infrared sensor inside the helmet to detect whether the rider wears a helmet or not. Alcohol sensor detects the alcohol level in driver. If it detects the alcohol, then the LED off and it means bike engine off immediately. The vibration sensor connects to GSM module, whenever the rider met with an accident and immediately sends the message to the registered numbers on that module.

II. EXISTING SYSTEM

Now a days, the bikes are made for humans for better life and to reduce the travelling time. But the usage of these bikes may leads to deaths. This injures the brain by hitting the road with heavy force. These happens due to not wearing a helmet.

Even though the cycles are very healthy vehicles , many children and youth are interested to ride the bikes without taking any precautions.

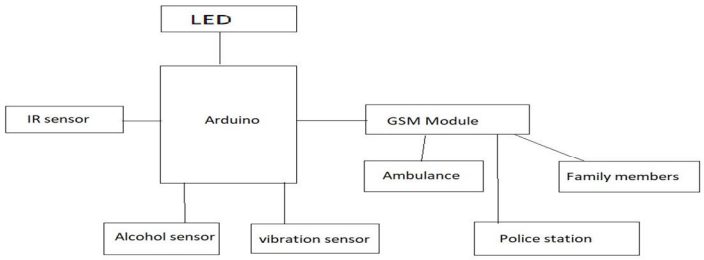
On several studies, the helmet usage is very less in teenage people when compared to the others. So , mainly we focus on these factor and made a helmet.

So to this existing helmet , we made small changes and make a new helmet.

III. PROPOSED SYSTEM

The main idea of this project is to get the information from the rider when he/she met with an accident. And this helmet sends the SMS to the known people. Incase of any alcohol detection in rider then the LED doesn't glow and it means the engine will not start until the alcohol level is low.

IV. BLOCK DIAGRAM AND HARDWARE COMPONENTS



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A. Arduino UNO

Arduino uno is a micro controller which acts as a brain to the whole project, in which it takes input, process it and gives the accurate output. This micro controller consists two types of pins.

1) Analog pins(A0-A5)

2) Digital pins(D0-D13)

This Arduino uno has more space when compared to the Arduino nano. Arduino uno uses micro USB where as Arduino nano uses mini USB



B. IR Sensor

IR sensor is an electronic instrument and is used to detect, whether the person wears helmet or not. This signal gives output to the Arduino. IR sensor uses infrared waves to detect the signals. It has two diodes, one is transmitting diode to transmit the infrared signals and another one is receiving diode to receive the signals from the object.



C. Alcohol Sensor

Alcohol sensor module – MQ3 is a gas sensor to detect the alcohol concentration from 0.05 mg/L to 10 mg/L. when the rider consume alcohol, then this sensor detects the gas and immediately off the LED, it means the bike engine turns to off state.



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D. GSM Module SIM 900A

GSM sim 900a is a device with quad band technology. This is a communication interface. This is used to send the information about the rider to their respective family members. This is connected to the vibration sensor. This GSM module activates only when the vibration sensor sends the signal to it.



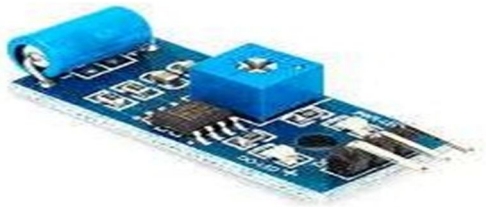
E. Ultrasonic Sensor

Ultrasonic sensor is a device used to measure the distance of the target using sonar. It sends the ultrasound waves. These waves travels towards the object and bounce back to the device. Thus measuring the distance. If the object moves towards the rider then the LED glows ON. It alerts the rider by glowing LED.



F. Vibration Sensor

Vibration sensor is a piezoelectric sensor, they have a transducer that converts mechanical force caused by vibrations, pressure to the electric signal using piezoelectric effect. Whenever the rider meets with an accident then the vibration sensor activates and send the signal to the GSM module and then immediately sends SMS to their respective registered numbers.



V. WORKING

The IR sensor detects whether the rider wears the helmet or not. The alcohol sensor also detects the alcohol level in rider. If the two conditions are satisfied then only the bike engine starts and it is indicated by LED. The two conditions are that , the rider must wear the helmet and the alcohol level should be low, then only the bike engine starts. These signals are given as input to the Arduinoboard and output can be shown as LED. Whenever the rider meets with an accident, then the vibration sensor activates and sends the signal to the Arduino. The Arduino then sends those signals to the GSM module which is connected to it and sends the SMS to the respective register numbers.

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VI. APPLICATIONS AND CONCLUSION

A. Applications

1) This safety system can be implemented in cars and the helmet is replaced with the seat belt.

2) This can be designed for less power consuming safety system.

B. Conclusion

This smart helmet ensures that the rider is wearing the helmet throughout the ride. The rider is free from alcohol while driving and may reduce the probability of accidents. Deaths due to driving under the influence of alcohol may minimised.

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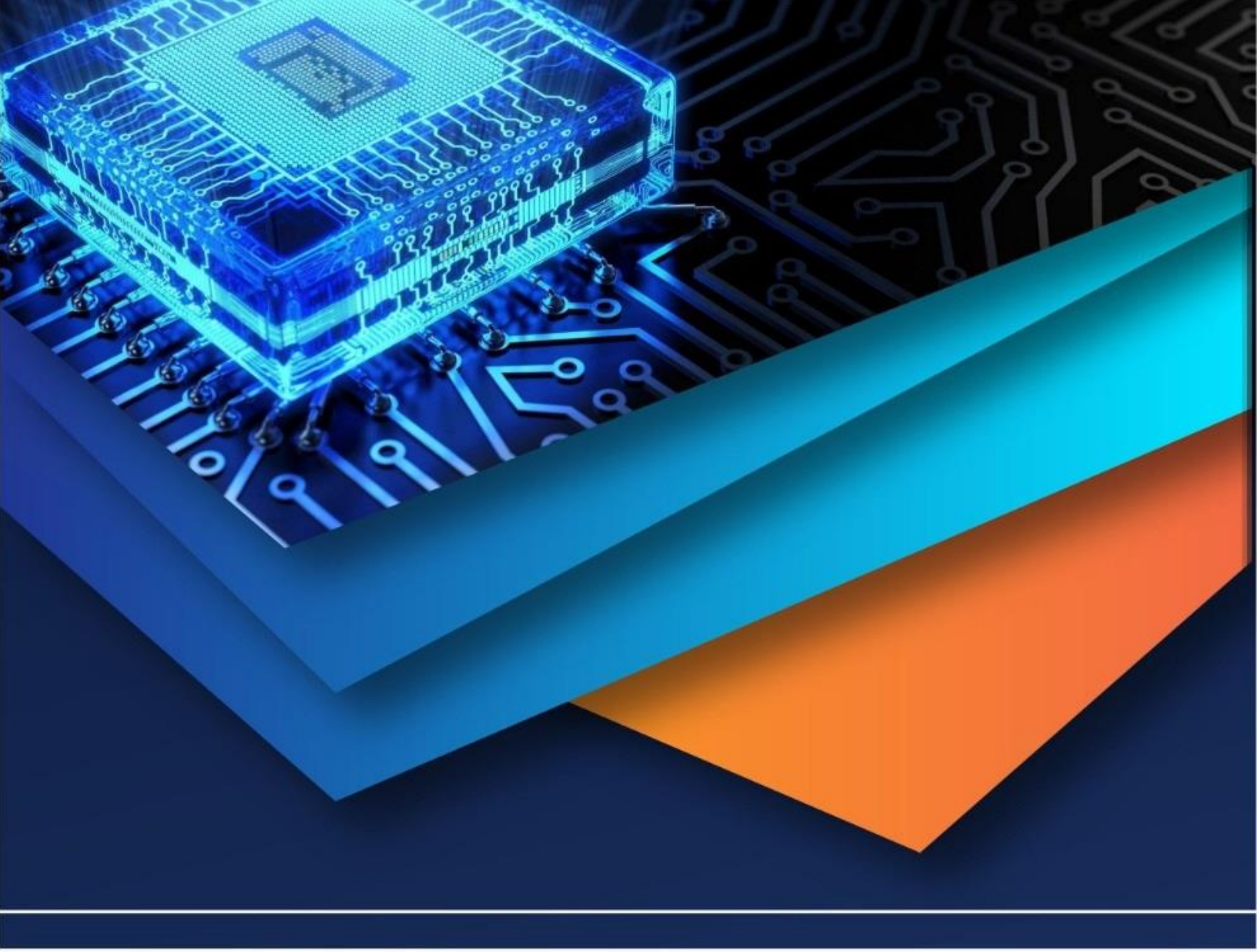
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