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Sting Helmet

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Abstract: Sting Helmet is a real-time application which can be used to reduce the accidents for some extent. A normal helmet will be useful not to cause more damage if an accident occurs, but with this sting helmet having additional features will prevent the accidents and save lives more than the normal helmet. When a person does not wear a helmet, it will not allow him to start the vehicle and also if the person consumed alcohol, he cannot start his ride. If the person riding the bike met with an accident immediately a message will be sent to the registered mobile number along with the location where the accident took place. We are using GPS for tracking the location .To detect the alcohol consumption we use gas sensor.

I. INTRODUCTION

Road accidents are on the rise day by day, and in countries like India where bikes are more prevalent many people die due to carelessness caused in wearing motorcycle helmets. Even though there have been continuous awareness from the government authorities regarding helmets and seatbelts a majority of the drivers do not need them.

In order to put an end to this misery we have developed the sting helmet for motorcycle, a way to stop starting of vehicles without wearing helmet or even if the driver is boozed. In addition, it has a great feature of detecting accidents and informs specific people via SMS with location with the help of GPS GSM based tracking system, thus aiding ambulance to reach the current location. We have implemented all the sensors within the helmet, which will send the information to the module connected with the bike engine .A display is provided to monitor the status.

This smart helmet has two modules, one on the helmet and another one on the bike. Accident sensor, helmet sensor and alcohol sensor are attached with the helmet module and GPS and GSM are connected with the module on the bike that has display to monitor status. These two modules communicate wirelessly using RF Transmitter and receiver with encoder and decoder, processor.

A. Existing system

In existing system, if the person met with an accident we may not ensure the fast first aid treatment; the person may die due to late medication. By using this proposed system, it sends an automatic alert message to the authorized person or ambulance in case of an accident or any emergency situations. The alert message body contains the place and time of the consequences to speed up the first aid service to the victim. To find the solution for all difficulties mentioned above, we are proposing a system that provides the multi feature helmet (smart helmet).In existing system we can ride the bike without wearing helmet but it is not possible with the proposed system.

II. PROPOSED SYSTEM

A. Helmet Detection

The circuit in each helmet is designed in such a manner that the bike won't start until the rider wears the helmet. This can be done with the help of an earlobe sensor which will detect the IR radiations transmitted from the human body to ensure that the helmet is worn by the ride.

B. Accident Detection

In our busy day to day life, due to lack of quality of the parts of our vehicles or due to our hurry or due to some other reason, accident may take place. Even though we have advanced medical equipment, we are unable to save many of lives. Why because we are not getting information about the accident location in right time. Our system works for this.

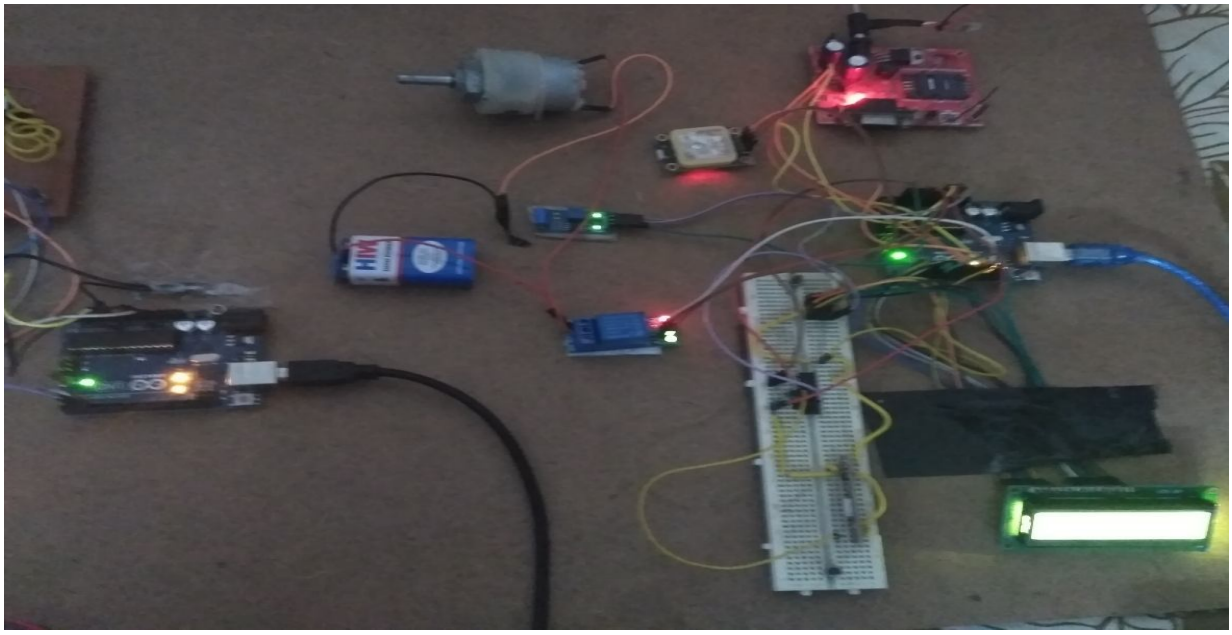
C. Alcohol Detection

This relatively low-cost and easy to build project detects the presence of alcohol of the people who are drunk and drive the vehicle. On sensing the alcohol, a signal will be sent to the controller and an alarm is activated.

III. FUNCTIONALITY OF THE PROJECT

Smart Helmet consists of two modules, one on the transmitter side(Helmet Module) and the other on the receiver side (Vehicle Module). The Helmet Module is a combination of switch, Gas Sensor and a Vibration Sensor. The Vehicle Module includes LCD screen, GPS and GSM modules and a DC Gear Motor. These two modules are connected wirelessly using RF Transmitter and RF Receiver.

When the rider doesn't wear a helmet, the motor will not start. If the person wearing a helmet consumes alcohol, the motor stops as the gas sensor detects it. The motor starts only if both the two cases are satisfied. (Helmet ON & Alcohol OFF). Vibration sensor here is used to detect accidents. A message will be sent to the registered numbers along with the location when accident takes place.



IV. MAIN RESULT

A. Algorithm Transmitter Side

1) Step 1 : start
2) Step 2 : Initialize variables t1, t2 (pins in micro controller) with values 2 and 3 respectively.
3) Step 3 : Now, set the above pins as output.
4) Step 4 : Low the pins t1, t2 initially.
5) Step 5 : Read the input from the analog input pin A0 and assign to the helmet variable, to check whether helmet is worn or not.
6) Step 6 : Read another analog input pin a1 for the detection of alcohol and assign it to alcohol variable .
7) Step 7 : Print the helmet and alcohol values on the serial monitor.
8) Step 8 : If helmet=1, make the helmet pin t2 high, else low.
9) Step 9 : If alcohol>500, make the alcohol pin t1 as high, else low.

Receiver Side

10) Step 10 : Initialize the variables r1, r2 , motor= 12 and boolean variables a1, b1 to false.
11) Step 11 : Maintain the BaudRate at 9600 for serial monitor.
12) Step 12 : Print the required content regarding helmet and alcohol detection on LCD.
13) Step 13 : Set the cursor position on LCD to (0,1).
14) Step 14 : Set the motor pin mode as output.
15) Step 15 : Initialize vibe variable for vibrations and read the input from analog pin A2.
16) Step 16 : If vibe>500 send the message to the registered mobile number.
17) Step 17 : If the values of r1 and r2 is equal to 1, move the cursor to starting position (0,0) and make a1 as true and b1 as false respectively, else make a1 as false and b1 as true respectively.
18) Step 18 : If both a1 and b1 are true make the motor pin as low, else high.

19) Step 19 : By using the functions gps.location.lat() and gps.location.lng(), we will get the latitude and longitude of the accident location.

V. OUTPUTS

Fig. 1 Helmet is not worn

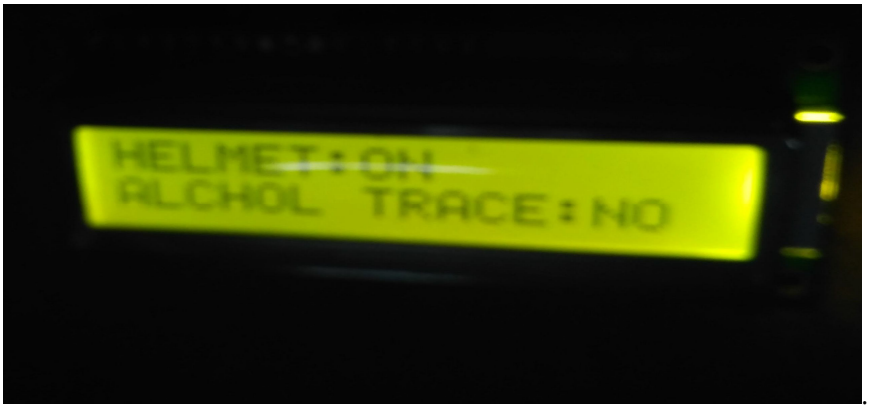


Fig. 2 Helmet detection

Fig. 2 Alcohol detection

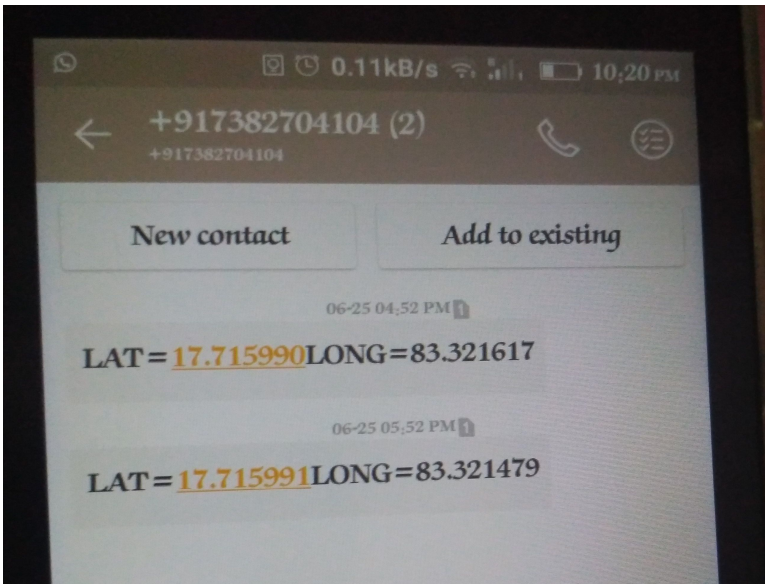


Fig. 4 Accident detection

VI. CONCLUSIONS

The Smart Helmet is simply user friendly with its new adaptable features. With the help of GSM and GPS, in case of accident the location of the accident can be easily identified and intimated to the family as well as to emergency services. The scope of this project relies on safety of motorcycle rider. Most of the motorcycle riders in recent days seem to be less concerned about their safety while riding, with Smart Helmet safety rates can be increased and chance of road accidents can be reduced. The accident rates for motorcyclists are increasing day by day all over the world. Smart Helmet for Motorcyclist using vibration sensor and Alcohol sensor in future will inspire safety features for motorcyclists.

A. Scope for Future Enhancement

1) An interactive communication system can be implemented with Smart Helmet by enabling a speaker and microphone inside the helmet which connect to the mobile phone of the rider.

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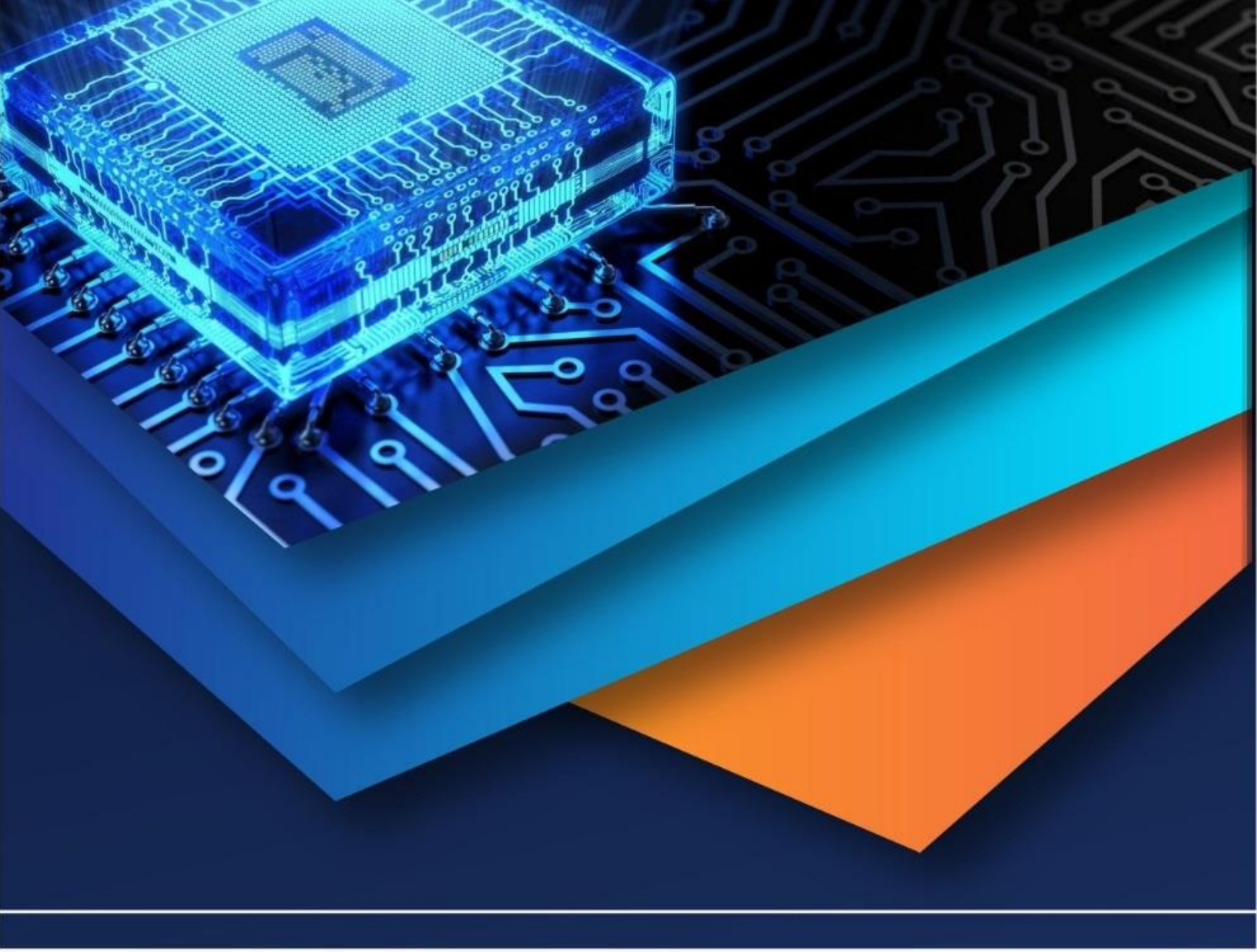

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