SMART HELMET FOR ACCIDENT PREVENTION

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Abstract - *In a developing nation like India, with advancement in the transportation technology and rise in the total number of vehicles, road accidents increases rapidly. This advancement in technology also increased the traffic hazards. Two wheelers accounts for 25% of total road crash death. Hence the ratio of road accidents that take place frequently increases causing immense loss of life due to poor emergency facilities. This paper provides an intelligent system for two wheeler accident prevention and detection for human life safety. The prevention part involves, Smart Helmet, which automatically checks whether the person is wearing the helmet and has non- alcoholic breath while driving. The relay does not ON the engine if these two conditions are not satisfied. The microcontroller controls the function of relay and thus the ignition. The system also enables detection of an accident at any place and reports about the accident to predefined numbers with GSM module. The Microcontroller continuously records all the parameters of automobile for prevention and detection of accident.*

Key Words: **Microcontroller, Zigbee, Alchoholic sensor DC motor, Motor driver, Bluetooth, GSM module etc.**

1. INTRODUCTION

In less developed countries, road traffic accidents were the most significant cause of injuries, ranking eleventh among the most important causes of lost years of healthy life. In Indian road system, widening of the road is not an alternative solution to avoid traffic in such a cities. The problems with state drunk driving control systems can be solved in many ways. The most effective will follow several principles: They will invest authority and responsibility in people and organizations at all levels, local to national, because drunken driving control requires action at all levels. They will operate in the public eye, using the media to report on problems and solutions, because ultimate decisions on priorities and resources to control drunk driving must have public support. They will not promise instant solutions based on a single action but rather will take steady steps towards long-term improvement. And they will establish mechanisms for identifying and solving problems rather than attempting to apply one-size fits-all methods. 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. Here we designed a system which checks the two conditions before turned ON the engine of the bike. Our system includes an alcohol sensor and a helmet sensing switch. A switch is used to detect whether the biker

is wearing helmet. Alcohol sensor is used to detect the biker is drunk, the output is fed to the MCU. Both the switch and the alcohol sensor are fitted in the helmet. If any of the two conditions are violated the engine will not turned ON. Alcohol sensor MQ3 is used here for detecting the alcohol concentration present in the driver's breath. Sensor provides an analog resistive output based on the alcohol concentration. MCU is the microcontroller unit, which controls all the functions of other blocks in this system. MCU takes or read data from the sensors and controls all the functions of the whole system by manipulating these data. Alcohol sensor is connected to the MCU through an interfacing circuit and the helmet sensing switch is directly connected to the MCU. MCU receives data from these sensors and it gives a digital data corresponding to the output of sensors to the encoder only if the two conditions are satisfied.

2. RELATED WORK

> ### 1.1 Tushar Raut et.al(1)

The Author has discussed safety and security of the riders in contradiction of accident. Measuring the alcohol level of the bike rider and checking the speed of the bike is the main advantage of this project. The ignition will be off if the alcohol level crosses the predefined value. It also has the GPS. By using this location of the accident happen is detected. And it sends the sms to the concerned people.

> ### Lakshmi Devi P et.al(2)

This project explains about the Zigbee transmitter and Zigbee receiver. This project has done only with the purpose of accident information to the concerned people. Here when ever the accident is happened, the location of the accident is send to the noted mobile number. The disadvantage is that the helmet cost is still high and it is of only one purpose.

## 2. HARDWARE REQUIREMENTS

- Arduino
- Zigbee
- Relay

- GSM Module

- ADXl 335 Sensor

- Bluetooth

- DC Motor

3. SOFTWARE REQUIREMENTS

- Arduino IDE.

4. PROPOSED DESIGN

PART-1 HELMATE PART
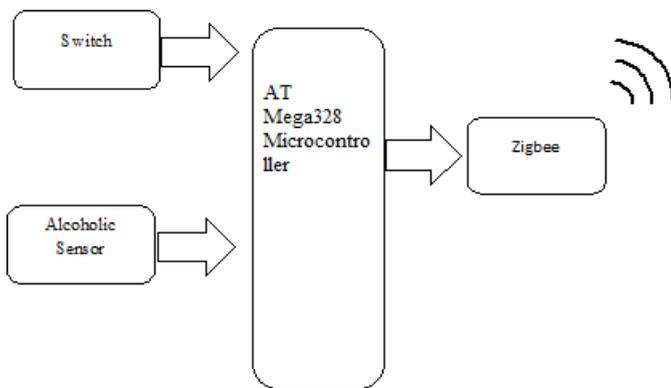
PART-2 BIKE PART
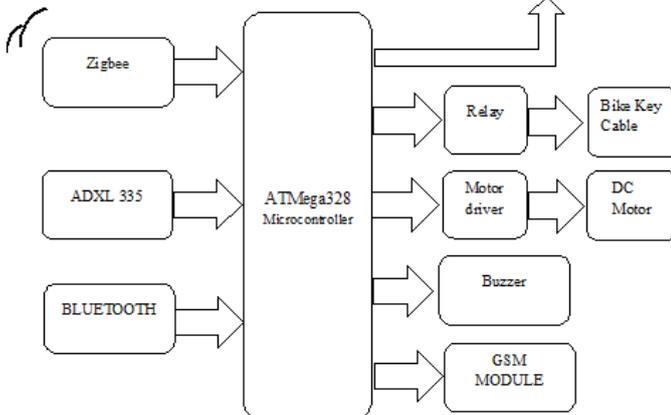
Fig -1: Block Diagram

WORKING

Here we have used an Alcohol Sensor, Accelerometer, Microcontroller, Communication modules and a buzzer for alert purpose. Here we designed a system which checks the two conditions before turned ON the engine of the bike. Our system includes an alcohol sensor and a helmet sensing switch. A switch is used to detect whether the biker is wearing helmet. Alcohol sensor is used to detect the biker is drunk, the output is fed to the MCU. Both the switch and the alcohol sensor are fitted in the helmet. If any of the two conditions are violated the engine will not turned ON. Alcohol sensor MQ3 is used here for detecting the alcohol concentration present in the driver's breath. Sensor provides an analog resistive output based on the alcohol

concentration. MCU is the microcontroller unit, which controls all the functions of other blocks in this system. MCU takes or read data from the sensors and controls all the functions of the whole system by manipulating these data. Alcohol sensor is connected to the MCU through an interfacing circuit and the helmet sensing switch is directly connected to the MCU. MCU receives data from these sensors and it gives a digital data corresponding to the output of sensors to the encoder only if the two conditions are satisfied.

5. EXPERIMENTAL SETUP

Fig -3: Experimental Setup

6. RESULT

The result of the complete system is given below with step by step process:

Step 1: Here the device is turn ON and ignition is turned off.Rider should wear the helmet to turn on the ignition. After that the device will check , if the rider has drunk and speed of the bike.

Fig -4: Indication of wearing a helmet

Step 2: In this step it checks rider has drunk. If he consumed the alcohol the sensor will trigger and send this data to the microcontroller.

Fig -5: When bike is off Alcohols is detected

Step 3: In this step speed of the bike is measured by the use of accelerometer sensor. Microcontroller sends the alert signal when the bike speed has reached the above threshold level.

Fig -6: When bike is off over speed is detected.

Step 4 Here it shows the smart helmet picture. Finally the speed of the bike and the rider has drunk is detected.

Fig -7: Smart helmet pic.

7. ADVANTAGES

➤ A safe 2 wheeler journey is possible which would decrease the head injuries throughout accidents caused from the absence of helmet .
➤ Additionally reduce the accident rate due to drunken driving

8. CONCLUSION

Nowadays, rash driving of motor bikes is the major reason for most of accidents. The severities of those accidents are increased because of the absence of helmet or by the usage of alcoholic drinks. In our project we have a tendency to develop an electronic smart helmet system that efficiently checks the wearing of helmet and drunken driving. By implementing this system a safe 2 wheeler journey is possible which would decrease the head injuries throughout accidents caused from the absence of helmet and additionally reduce the accident rate due to drunken driving. We have a tendency to introduce advanced sensors techniques and radio frequency wireless communications are included in this project to make it a good one. Our system efficiently checks the wearing of helmet and drunken driving.

REFERENCES

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