

Smart Helmet

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Abstract - In this competitive world one of the surveys says that the death tolls due to motor-bike accidents are increasing day-by-day out of which most of these casualties occur because of the absence of helmet. Traffic police cannot cover remote roads of the city. That's why our primary target is to make the usage of the helmet for two-wheelers "compulsory". The helmet would be used to communicate with the motor bike all the time during the initiation of the ride to detect if the person is wearing the helmet or not. If bike rider is wearing a helmet then bike engine will ignite otherwise not. The objective of project is to design intelligent helmet system which ensures wearing of helmet and prevent switching ON bike if rider is under influence of alcohol throughout the ride.

Key Words: RF Module, ArduinoUNO, Gas Sensor, Push Button.

1. INTRODUCTION

In today's era, especially in the young generation, the craze to ride bike is rapidly increasing. The middle-class families prefer to buy two-wheeler over four-wheeler because of their low price [1]. As the number of two-wheeler on the road are increasing, road mishaps are also increasing day by day. In the event of an accident, lack of timely medical attention to the injured person may lead to death. Thus, there is a need for a system which ensures safety of rider by enforcing rider to wear helmet as per government guidelines. The objective of project is to design intelligent helmet system which ensures wearing of helmet and prevent switching ON bike if rider is under influence of alcohol throughout the ride.

2. LITERATURE REVIEW

The thought of developing this paper comes from social responsibility towards the society. As we can see many accidents occurring around us, there is a lot of loss of life. According to a survey, around "750" people die in road accidents occurring due to bike crashes per year.

The reasons for the accidents may be many such as no proper driving knowledge, damaged bikes, rash driving, „drink and drive" etc. But the major reason was found to be the absence of helmet on that person's head, resulting in an immediate death due to brain damage.

Hence the prime objective of our paper is to force the rider to wear the helmet throughout the ride. So, this sense of

moral responsibility towards the society, laid the foundation of our project "Smart Helmet."

So the basic idea for developing this project "Smart Helmet" is taken from [1] [2] & the basic idea about the working of ArduinoUNO microcontroller is taken from [3] & [4] And the further more detailing regarding the functionality of each and every hardware and the software components used are such as Radio transceiver is taken from [5] and information and working of Ultrasonic sensor from [6]. The main component or the microcontroller used, that is ArduinoUNO. The working principles and the circuit connections etc are taken from the references, [7] [8] & [9]. Thus, these are all the references helping the development of the project.

3. PROJECT DESCRIPTION

The idea of our project "SMART HELMET" is to first check if the rider has actually worn the helmet, in other words the availability of the rider's head inside the helmet. For this purpose, we are using a push button for detection.

We are also using a gas sensor in the helmet for the detection of alcohol consumption by the rider. To turn on and off of ignition system of bike, we are sending a signal to ignition system from helmet through the RF module, which will control the on and off of the bike.

We are using ArduinoUNO, a computing platform, which contain ATmega32A microcontroller through which we are controlling the whole system by using the proper coding skills.

Table - 1: Components and their Estimated Cost

Sr. No.	Components	Price(Rs.)
1.	ArduinoUNO	1500
2.	Push Button	100
3.	RF Module	2800
4.	Gas Sensor	1200
5.	Relay	500

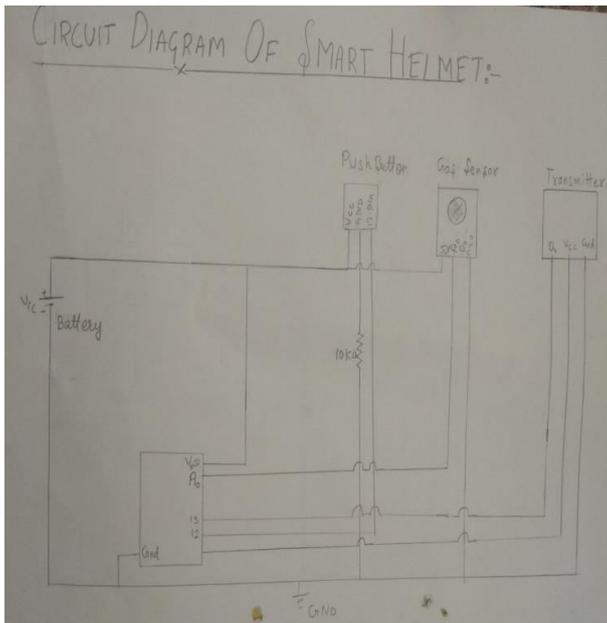


Fig -1: Circuit diagram of Smart Helmet

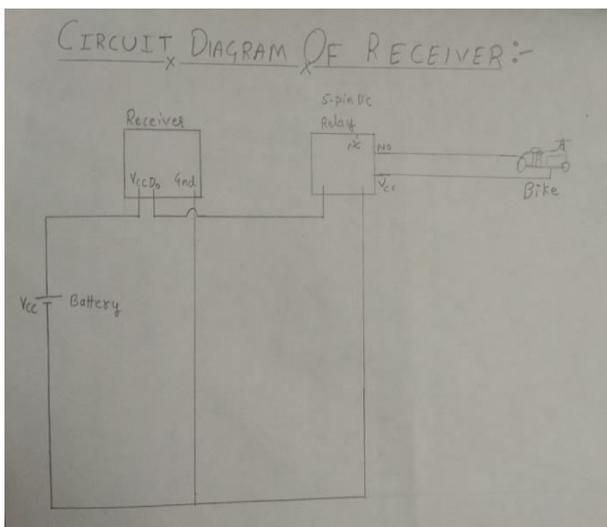


Fig -2: Circuit diagram of Receiver

4. RESULTS AND DISCUSSION

4.1 Status of Rider Wearing Helmet

With the help of push button, driving without helmet can be avoided. As push button based on pressure, if we remove helmet the pressure exerted by the head is removed and the switch turn off, which turn off the bike ignition system. If output is high, then rider is wearing helmet and vice-versa. Which shows that the driver always wearing the helmet while driving.

4.2 Blood Alcohol Content (BAC) Test

Illegal consumption of alcohol during driving is 0.08 mg/L as per the government act but for demonstration purpose, It is programmed to the threshold limit 0.04 mg/L. The threshold limit can be adjust in gas sensor by proper coding skills. if value detected by gas sensor is greater then

threshold limit then the ignition system will not start, which shows that the driver is free from alcohol consumption.

5. CONCLUSIONS

This helmet can reduce number of road accidents that takes place every day. It ensures the safety of the biker as well as sends the victim's location to family members and nearby police station. Also, death rate can drastically be reduced by implementing this circuit as mandatory while driving and make everyone's life easier and smoother. The developed system efficiently ensures:

- (i) Rider is wearing helmet throughout the ride.
- (ii) Rider should not be under influence of alcohol.

By implementing this system, a safe two-wheeler journey is possible which would decrease the head injuries during accidents and also reduce the accident rate due to driving bike after consuming alcohol.

A helmet may not be a 100% fool proof but is definitely the first line of defence for the rider in case of an accident to prevent fatal brain injuries. The proposed approach makes it mandatory for the rider to use this protective guard in order to drive a two-wheeler vehicle and ensures the safety of the human brain and therefore reduces the risks of brain injuries and deaths in case of an accident.

6. FUTURE SCOPE

The project can be enhanced by adding Google Glass Technology. Through this technology, biker can see the upcoming road before reaching that particular place. It can prevent biker from pits and pitiful condition of roads. Also, biker can see navigation on it and can alert him while taking sharp turns. Further, it can implement on cars also. People can use car seat belt to start ignition of car which can enhance the safety of the driver.

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