

Smart Helmet with Ignition Off System

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Abstract - The major cause of death in two-wheeler riders is carelessness, over-speeding and drunken driving. Innumerable lives could be saved if there's an emergency medical service could get in action with the immediate accident information of the person into victim. All together we've come up with a solution to most probably overcome the problem faced due to this in our daily day to day lives. All these major issues made us to sum up and develop this idea and prototype it. Our main objective of our project is to design a compatible, portable with low cost smart helmet that is capable of identifying if a person has consumed alcohol or not and to probably prevent road accidents. The main motive of this smart helmet is to provide at most safety for rider as well as for the people who walk on the footpaths or beside the roads. We've done by adding up few advanced technologies that add up to our project like Arduino, MQ-3 sensor, Piezo electric sensor etc. In our project, it's compulsory to wear helmet, without helmet ignition switch will never turn ON. If a rider is drunk or if an accident takes place, then automatically ignition switch will be locked.

Key Words: Arduino¹, Smart Helmet², Road Safety³, Drunken Driving⁴, Alcohol⁵

1. INTRODUCTION

Road transportation plays an essential role in our lives in every part of the world. Everyone in this world uses the roads in some way, but compared to the 1950s, the current system has changed a great deal. In addition, the accident rate has also increased due to the high risk involved in travelling. Statistics reveal that in India over eighty thousand people are killed in road accidents every year, which equals thirteen percent of the total number of road fatalities across the globe. It is common for road crashes to occur because of carelessness, drunken driving, and lack of road safety awareness of the person driving/ riding. Our mission is to provide road safety information for road users and make them aware of the importance of keeping themselves and others safe on the road. As well as reducing the number of

accidents, we can reduce the amount of people injured every year. Around 13 lakh people die in road accidents around the world every year and 30 - 60 million people are injured. There is a major cause of death among the 5 to 29 age group for all age groups in road accidents. By enforcing the laws on over speeding, drunk driving, seat belts, child safety and helmet usage, millions of lives could be saved and injuries could be prevented. A safer road design coupled with improved vehicle safety standards can help save many lives.

2. ARDUINO

With a market share of more than 50%, Arduino UNO is the most popular of all Arduino boards. Arduino UNO is based on ATmega 328P Microcontroller and is considered the best prototyping board for newcomers to electronics and coding. It is the ideal prototyping board for beginners in electronics and coding. There are two types of Arduino UNO: one with a through-hole microcontroller connection and another with a surface mount type.

We should consider a through-hole model because the chip can easily be removed in the event of a failure and replaced with a new one. Arduino UNO has different features and capabilities. A total of 14 digital input / output (I / O) pins are available on the UNO, and these pins can be used as inputs or outputs by connecting them to external devices and components. PWM signal, which operates at 5V and is capable of delivering 20mA.

3. WORKING

The most common causes of death for two-wheeler drivers include over-speeding, drunken driving, and careless driving. The resolution of these problems is the primary motivation for developing this project. Having this in mind, we decided to develop this project. The objective of our project is to design a low-cost intelligent helmet that is capable of

detecting alcohol consumption and preventing road accidents. With advanced features such as alcohol detection, accident identification, location tracking, and hand-free operation, the technology can also detect falls and operate on solar power. As part of our project, helmets must be worn, and the ignition switch cannot be turned on without them.

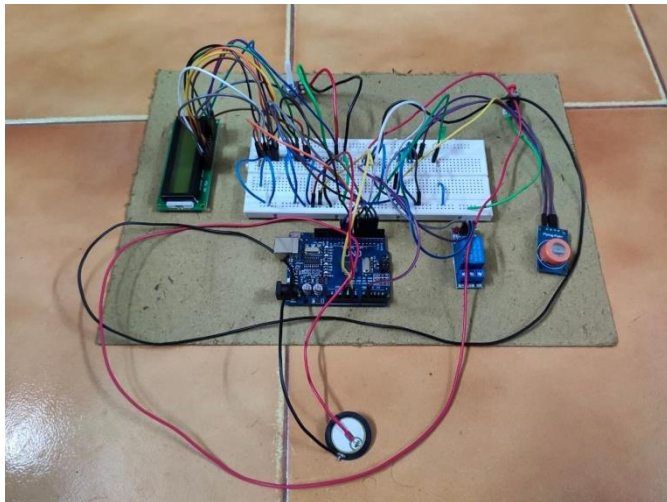


Fig - 3: Prototype of Smart Helmet with Ignition Off System

4. LIMITATIONS

1. There is no traffic-related helmet check in the region where bikes are not required to wear helmets.
2. There is a tendency for drivers to wear helmets only where they anticipate checking will happen; they do not wear helmets when no checking is done.
3. It is possible to turn the vehicle on or to steal it by passing the ignition switch.
4. India is one of the largest countries in the world, making it nearly impossible to test the alcohol levels present in the bloodstream of every individual rider.
5. In the event that an individual is caught drunk while driving, they can be issued a suspended license, jail, a Guinness record, court appearances, arrested and booked, and are required to undergo an alcohol assessment.

6. According to India's crash statistics, the number of drunken driving accidents has quietly decreased from 2008 to 2017.
7. When the driver anticipates checking may occur, he wears a helmet only in those areas, not in those areas where no checking seems likely to happen.
8. Bikers do not wear helmets in the region where traffic checking is not done.
9. There is a tendency of the driver to wear helmet only where the anticipate checking may takes place, they do not wear helmet where no checking is done.
10. The vehicle may be turn on or may be stolen by passing the ignition switch.
11. Testing alcohol content present in blood in each individual rider in big countries like India is almost impossible.
12. Accidents due phone calls as previous helmets do not contain Bluetooth speakers.

5. CONCLUSIONS

Smart helmets are designed to ensure a rider's safety by making wearing a helmet mandatory, and also to make sure he or she hasn't consumed too much alcohol over a designated limit. In the event any of these prime safety rules is broken, the proposed system will prevent the biker from starting the bike. Using the system, police can easily locate the motorcycle driver in the days following an accident. It also helps in efficiently handling the aftermath of accidents. When a victim sustains an injury, this ensures that medical attention is provided to them immediately.

Research on road safety incidents has provided a more complete understanding of the physiological processes that occur during drunk or near-drunk driving accidents. Researchers suggest that patients who drink will be more likely to survive in an incident due to the cooperative effect of drinking people. Nevertheless, the relationship between the processes is still unclear. Since laboratories do not have access to specific devices, research is hindered by a lack of complete knowledge about drunk driving incidents.

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