

# Smart Helmet 1.0

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**Abstract-** The basic idea of the project is to make the smart helmet 1.0 that without wearing it the driver won't be able to start the bike, so that it can ensure the safety of the riders. The main purpose of the project is to encourage wearing helmet. This can be implemented by using advanced features like Bike starting through helmet itself (by use of fingerprint sensor), Antitheft system (only registered particular person can ride the bike), Alcohol Detection sensor, Anti sleep system (By using Eye Blink sensor). This makes it not only a smart helmet but also a feature of a smart bike. It is compulsory to wear the helmet, without which the ignition switch cannot turn ON. Theft and Drive protection using Intelligent Wireless Safety Helmet" is developed. It consists of an intelligent system embedded into the helmet and the vehicle It communicates with vehicle unit to switch off ignition system of bike if above condition is not met.

**Keywords-** Arduino, Fingerprint sensor, Alcohol sensor, Eye-Blink sensor, Force sensing register, Alarm.

## I. INTRODUCTION

Nowadays there are many accidents occurred in our daily life. This system is mainly for the security purpose and safety for the bike riders against the accidents. The first step in this system is to check whether the helmet has been wearing or not, the bike will not start unless the rider wears the helmet for this, we go for FSR sensor which will sense the pressure and force

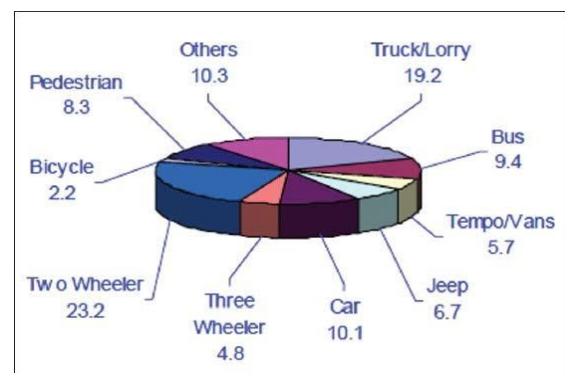
Helmets create an additional layer for the head and thus protect the wearer from some of the more severe forms of traumatic brain injury. A smart helmet 1.0 aims to reduce the risk of serious head and brain injuries by reducing the impact of a force or collision to the head.

The aim of this project is to make a protection system in a helmet for the safety of bike rider. The smart helmet 1.0 that is made is fitted with different sensors responsible for detection.

## II. LITERATURE REVIEW

The concept of SMART HELMET 1.0 arises from the certain issues that has been observed and experienced by

us. One of the major case is of lost in lives due to bike road accidents. The alarming increase in mortality and morbidity owing to road traffic accidents has been a matter of great concern globally. This study was undertaken to find the trend of two wheeler accidents over the five years (2000-2004) with respect to age and sex of the victim, type of injury sustained, type of vehicle involved and time distribution of accidents. Data was retrospectively collected from the records at the Regional Transport Authority's office, office of superintendent of police and also from both the Traffic police stations of the Mangalore city. Results were tabulated and the analysis was done using SPSS version 10. Test of significance was applied and p value <0.05 was taken to be significant. A total of 1231 two wheeler accidents were recorded during 2000-2004. Majority (77%) of the victims were in the age group 18-44 years. Accident rate among males (83%) was higher than that among females (17%). Five percent of the victims (n=75) succumbed to injuries, of whom 45 died on the spot. Geared vehicles (81%) were more commonly involved than those without gears. Highest number of accidents was seen during 6-10 pm. There is considerable morbidity and mortality due to two wheeler road traffic accidents. Among the fatalities majority died at the spot. Most of the deaths were attributed to non-use of helmets. Below Pie chart states that majority of road accidents happens with two wheeler rider.



## III. PROBLEM STATEMENT

In India still most of the people prefer two wheelers compared to other form of vehicle due to simplicity and its low cost. One important problem is bike riders suffer from inadequate roads and bad driving conditions. Other important problem with bikers is that sometimes we hesitate to wear

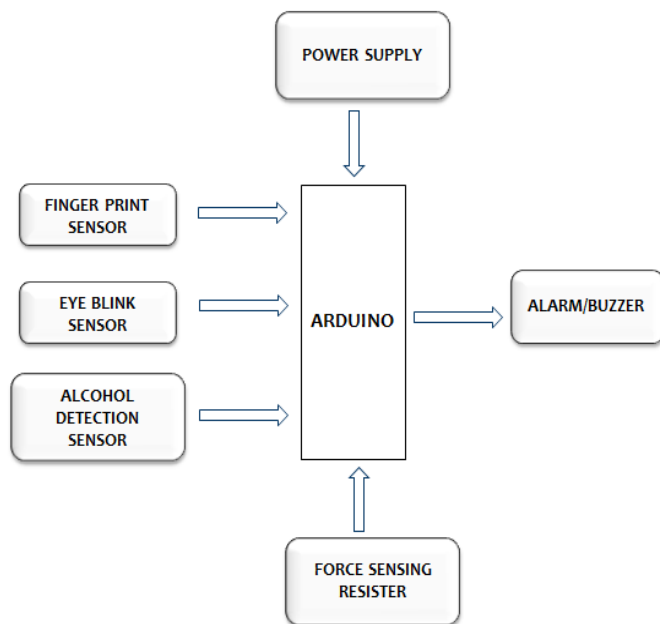
helmet due to sweating issue & carelessness and this will give rise to increase in accidental injuries more which could be fatal when accidents happen.

Additionally, state highways had a share about 25 percentage of the total road accident in 2018. Roughly around 17 accident-related deaths occur across India every hour. Fewer cops and empty roads at night, and sometimes even during the day seem to enable motorists to do away with the traffic rules. Main reason to accidents is carelessness of human being such as using mobile phones while driving, Rush driving, listening loud music, over speeding, alcohol consumption & carelessness of safety gears.

The road network has played a crucial role in India’s economic development and the government is likely to continue to invest resources in making road safety a vital component of everyday commute. To avoid accidents and to encourage people to wear helmet we decided to design a smart helmet 1.0.

**IV. PROPOSED WORK**

**Block Diagram**



**Working**

Here we are interfacing some sensors to our Arduino Uno such as Fingerprint sensor, Eye-blink sensor, Alcohol sensor & Force sensing resistor as input devices which will sense condition as per our requirement and send signal to our controller. Further controller decodes this signals and

sends output commands to its output pins where our output devices are getting connected. If someone tries to start bike with unregistered finger print then bike won’t be able to start also if driver is drunken then Arduino will lock ignition drum and bike won’t be start. In rare condition when rider feels sleepy and felt asleep then eye blink sensor detects it (If we close eyes more than 2 Seconds) and buzzer or beeper made noise in helmet and rider will get alert.

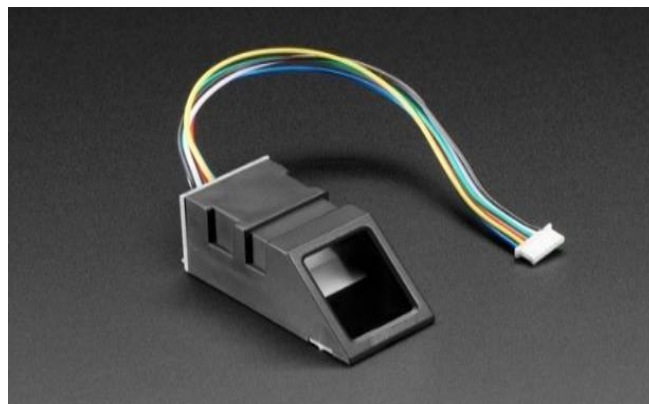
**V. COMPONENTS**

**Arduino Uno**



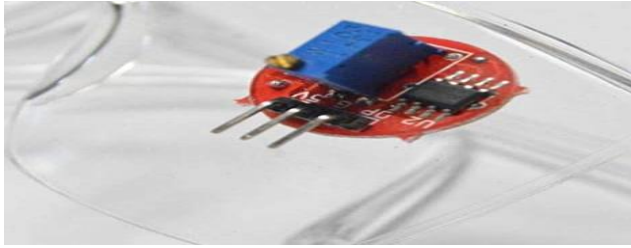
The Arduino Uno is an open-source microcontroller board based on the Microchip ATmega328P microcontroller and developed by Arduino.cc. The board has 14 digital I/O pins (six capable of PWM output), 6 analog I/O pins, and is programmable with the Arduino IDE (Integrated Development Environment), via a type B USB cable. It can be powered by the USB cable or by an external 9-volt battery, though it accepts voltages between 7 and 20 volts.

**Fingerprint Sensor**



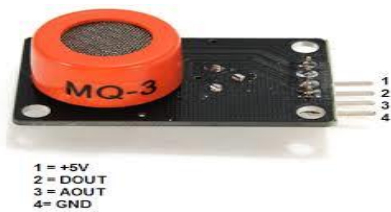
A fingerprint scanner is a device used to identify a person by scanning their fingerprints. We have several ridges on our fingers. Additionally, every person has a unique pattern. Hence, a fingerprint scanner scans them to identify us. We are using this sensor to have access to start the bike.

### Eye Blink Sensor



The eye-blink sensor works by illuminating the eye and eyelid area with infrared light, then monitoring the changes in the reflected light using a phototransistor and differentiator circuit. Here we used this sensor for Anti-sleep system.

### Alcohol Detection Sensor



MQ-3 gas sensor shown in Figure 2 is used for identifying the alcohol content from breath. It can be positioned just in front of the mouth. The sensor responds to various molecules in alcohol and determines if the rider is drunk.

### Force Sensing Resistor



The sensing film consists of both electrically conducting and non-conducting particles suspended in matrix. Applying a force to the surface of the sensing film causes particles to touch the conducting electrodes, changing the resistance of the film.

### Buzzer



A buzzer or beeper is an audio signaling device, which may be mechanical, electro-mechanical or piezoelectric. Here we used buzzer for alarm for anti-sleep system.

### Power Supply



A power supply is an electrical device that supplies electric power to an electric load. Here we can use any battery of output voltage 7-20 V to power our controller i.e. Arduino Uno.

## VI. KEY FEATURES

- Antitheft system :- Particular access to bike by using fingerprint sensor inside the helmet.
- Antisleep system :- By using Eye blink sensor and alarm
- Alcohol detection system :- The alcohol sensor is used to sense the alcohol consumption and it will lock the ignition if drunk.

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