



# DT BASED INTENSIVE STUDY ON SMART HELMET

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## Abstract

The driver's carelessness is the primary cause of such collisions. When compared to other vehicles, two-wheelers have more accidents. One of the most common causes of two-wheeler accidents is the failure of drivers to follow official traffic laws. Wearing a helmet while riding a two-wheeler is one of the most important rules to follow. After that, Over speeding, drunken driving, and careless driving are the leading causes of mortality for two-wheelers these days. The simplest way to avoid these causes is to wear a helmet. Accidents, as we all know, are becoming more often by the day. We gain additional ideas for Smart Helmet after reading these publications. The goal of this approach is to guarantee that all motorcycle riders are required to wear a helmet. In our project we have implemented as design thinking approach.

## Introduction

The main object of this project is to sure people wear helmets and safe rides. Hence road safety becomes a major issue of concern. We take to the survey approximately, 1.3 million people die each year as a result of road traffic crashes. And road traffic injuries are the major leading cause of death for children and young adults aged between 14-and 29 years. In 2017, more than 48,746 two-wheeler users died in road accidents, Incidental 78.3% of them did not wear a helmet. And then traffic accidents in India have been increased every year. In a developing nation like India, with advancements in transportation technology and a rise in the total number of vehicles, road accidents increase rapidly. We take all these surveys and issues that motivate the development of this

project. First of all Internet of things is currently used in many fields like home automation, smart appliances, etc. The aim of this unique helmet is to provide safety to the bike rider. In our project, the Smart helmet's major role is GPS. The GPS data will contain the latitude and longitude values using which we can find the accurate position of the accident place. In design thinking concept the smart helmet to be designing the more sensors and compact helmet to be introduced in future.

## PREVIOUS WORK OF THE PAPER

[1] This approach is divided into two components. For example, health monitoring and safety. Employee monitoring It employs the heart Beat sensors, temperature sensors, and a tri-axis accelerometer are all available.

[2] The system is made up of a microcontroller, a position sensor, an alcohol sensor, a piezoelectric sensor, and an RF transmitter. GPS, IOT modem, and transmitter solar panel.

[3] A microcontroller is linked to the GSM module and accelerometer. The notification and accident report is given via the cloud infrastructures.

[4] There are two units, one of which is a helmet unit and a two-wheeler portion that makes use of a Microcontroller, helmet sensor switch RF encoder, RF transmitter, unit GPS module, accelerometer module, a sensor of speed.

[5] It is made up of a data processing unit (Arduino), air quality sensors, an infrared sensor, a GSM modem a warning unit, and a liquid crystal display to Identify the threat in the mining region.

[6] Ultrasonic sensors, an Arduino, a microprocessor, a DC motor, and LEDs are used.

[7] Several sensors, including an accelerometer, are linked to cell phones via APIs.

And then we survey the block diagram for IOTbased Smart Helmet in refer some publication for,

[8] whose published, In our point of view they take the survey,

[9] whose published, we take a survey of this paper-like.

## I.PROPOSED SYSTEM

The traditional helmet does not have any features that are similar to this smart helmet, but there are other intelligent helmets available with characteristics that are similar to the smart helmet. In our project IOT based Smart helmet system mainly consists of 2 modules: Helmet module Bike module. And helmet consists of switches that are connected to a microcontroller. And then sensors to be used in this project such as

- Alcohol sensor
- Vibration sensor
- GPS module

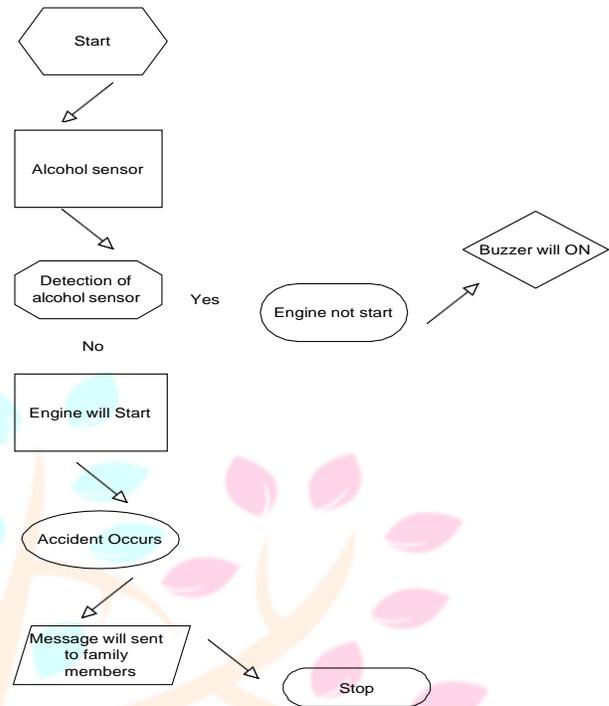
And then a mode of communication like GSM, WIFI, BLUETOOTH, RFID, ZIGBEE.

The switch determines whether or not the rider is wearing a helmet, and the alcohol sensor determines whether or not the rider is inebriated and communicates the signal to the bike section through an RF transmitter. We're developing a smart helmet that employs internet of things (IoT) technologies to ensure riders' safety. by avoiding roadside motorcycle accidents,

- The system detects whether or not the rider is wearing a helmet.
- It detects the rider has taken too much alcohol, the bike engine willnot start.
- When a bike rider is engaged in an accident, the gadget recognizes, it and sends a notification with a location to the registered contact.

If the cyclist is involved in an accident, the MEMS sensor activates and transmits data from the RF transmitter to the RF receiver, which is mounted on the bike. SMS is sent to the recipient in this scenario. Through the GSM module, family members and local hospitals may be contacted. GPS technology is utilized to pinpoint

the precise location of the location or region where the accident happened. In DT based these prototype will under the over idea for our project.

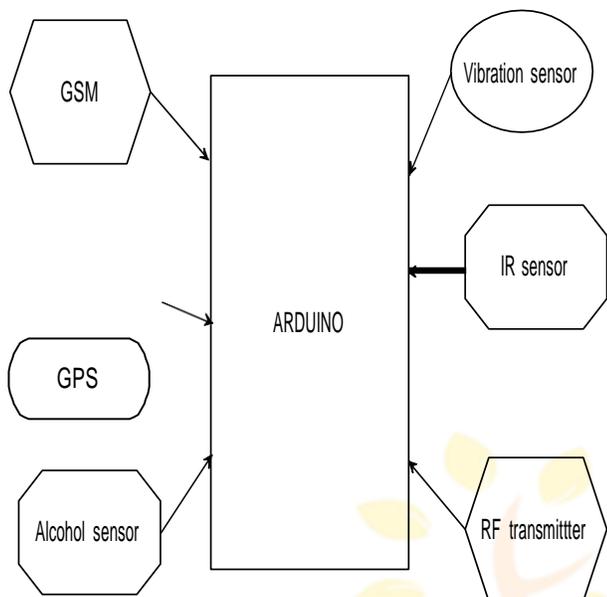


**Figure 1.** Flow chart for smart helmet.

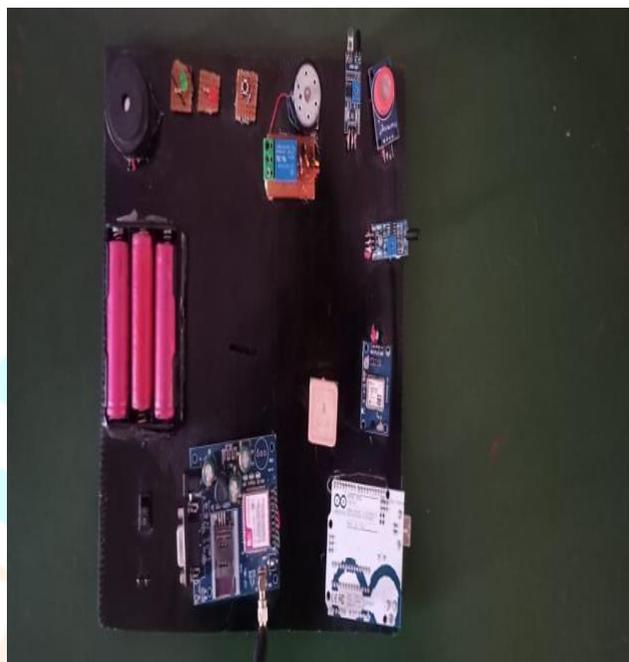
The force sensing resistor is located on the inside upper part of the helmet, where the head will actually come into contact with the sensor surface. And an alcohol sensor is put in front of the rider's lips so that it can detect alcohol readily. Solar panels are positioned on the upper side of the helmet, which is exposed to direct sunlight. The battery and standard circuits were also installed within the helmet. In addition, a secondary controller and an RF transmitter circuit were installed within the helmet. The antenna is situated on the exterior of the helmet. The data from the helmet (i.e. transmitter) unit is accepted by the RF receiver. If the requirements are met, the ignition will start and the bike will move. The GSM may communicate the bike's location information indefinitely. In the event of an accident, the vibration sensor activates and communicates the location information to the registered cellphone number. It is already mentioned that the project is divided into twounits namely helmet and bike. In this method we take the block diagram referring publication for,

Finally we design the hardware module and get output result will be done.

## II. SIMULATION RESULTS



**Figure 2.** Block diagram for smart helmet.



## III. APPLICATIONS

1. We can employ smart helmets in real life as a real-time application.
2. Smart helmets may be used as a key. We are unable to start the car without the helmet.
3. Intelligent helmets can be utilized to alert triple riders. Consuming alcohol, using a cell phone, and Riding are also risky.
4. Smart helmets can also be used in mining locations. also in the construction field to ensure worker safety workers.
5. It is possible to detect an accident in a faraway place. Discovered and medical treatments delivered in a timely manner
6. It will lower the likelihood of accidents just by being there. Using an alcohol detector to avoid drunk driving.

S.NO	Comparitive analysis of various publications	Limitations
1	Health monitoring system	Ensure that good has fallen detecting the laborers at the workplace.
2	Used more Sensors	cost-effective
3	Ultrasonic sensors, an Arduino,a microprocessor, a DC motor, and LEDs are used.	A suitable power supply should be provided.
4	Several sensors, including an accelerometer, are linked to cell phones via APIs.	There may be situations when the detection is incorrect.

Table 1: Comparitive analysis for Smart helmet

## IV. Conclusion

By analyzing all of the documents, the helmet should be created to limit the number of accidents on two-wheelers. This may be done by creating the gadget utilizing IoT technology. Thus, the system is extremely beneficial for user safety, and the important point is "Riding the two-wheeler vehicle with Safety" and it may supply better security to the biker. Then we may infer that the smart helmet system should be quite effective and necessary for guaranteeing biker safety.

## V. Future scope

1. We may use bioelectric sensors on the helmet to track various activities.
2. Because of its unique identifier, the car may be quickly identified in the event of theft.
3. In the case of four-wheelers, the smart helmet may also be converted to a seat belt system, which will be adopted in the future.
4. We can utilize a tiny camera to capture the driver's activities. It may be used to wirelessly transmit messages from one vehicle to another.

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