

# IoT Based Intelligent Headgear: An Instant Reporting System of Live Scenarios

Sindhu G

Assistant Professor, Department of  
Information Science and  
Engineering, Sri Krishna Institute  
of Technology, Bangalore, India,  
sgis.skitblr@gmail.com

Manasa R

Information Science and  
Engineering, Sri Krishna Institute  
of Technology, Bangalore, India,  
manasamaansa@gmail.com

Pooja M

Information Science and  
Engineering, Sri Krishna Institute  
of Technology, Bangalore, India,  
poojagowda7119@gmail.com

**Abstract:** *Auto collisions are on the ascent in our nation, the majority of them are brought about by carelessness of not wearing a headgear, driving under the influence, and speeding, prompting passing or genuine injury because of the absence of clinical medicines gave to the harmed individual at the opportune time. This inspires us to consider making a framework that ensures the wellbeing of the motorcyclist, by making it obligatory for the motorcyclist to wear a headgear to stay away from head wounds that can prompt quick demise, evade liquor utilization and drunken drive while testing, the motorcyclist breath. Prior to travel, abstain from speeding and rash by cautioning the motorcyclist and furthermore to give sufficient clinical consideration in the event that you experience a mishap by informing the individual worried of the area subtleties. Bluetooth helps in noting the crisis calls and avoids distraction.*

**Keywords:** *Accelerometer; Microcontroller; Alcohol detection; Accident detection; Bluetooth*

## I. INTRODUCTION

India is the vast country and road transport is the backbone of the country, from freight to associated urban areas and towns. The youthful age lean towards motorcycle and cruisers to four wheels. Motorcyclist abstain from wearing a headgear with no particular explanation. Also, speeding, drinking, and driving have become common problems. Because of absence experience or focus and violation of traffic regulations, leading to mishaps. Thus, with the assistance of innovation, we ensure that the traffic rules are followed, the issues referenced above are evaded and their belongings are limited. Numerous individuals pass on the streets every year that they happen because of motor-cycle mishaps. There are different purposes behind mishaps, for example, not having adequate driving ability, faulty two-wheeled vehicles, reckless driving, drinking and driving, etc. In any case, the principle reason was the nonappearance of a headgear on the individual prompting quick passing because of mind harm. Subsequently, it is significant that there is an office to limit the eventual outcomes of these mishaps. However, the primary goal of our work is to make it compulsory for the motorcyclist to

wear a headgear during the trip, to abstain from driving under the influence circumstances and speeding or rash by motorcyclists and also to give sufficient medical attention when he is found with a mishap alerting the person concerned who will provide answers for other major mishap problems. According to government reports, the name of mishaps caused is 4.64,910, which resulted in 1.34,796 fatal accidents, of which 1.47,913 injured also include pedestrians and mishap victims. In which motorcycle mishaps are the most important victims. [1] Advance Bike Security System uses DPDT switch that is utilized to guarantee the wearing of headgear, ON state of the switch guarantees the setting of the headgear in the best possible way. The system efficiently checks the wearing of the headgear and drunk and driving. The framework model uses DPDT electro-mechanical relay. [2] Bike rider's safety using helmet uses data from the headgear will be transmitted wirelessly to the motorcycle. According to the different sensor inputs, the microcontroller will decide the actions of other blocks. Low or high sensor output detects headgear performance. The microcontroller can run just one program at a time. [3] Smart Helmet and Intelligent Bike System, if the motorcyclist comes across an mishap ignition switch, it is locked and automatically sends the message to your enrolled number with your current location. Mishap prediction with images cannot be predicted.

### A. Objective

The principle target of this framework is to plan a headgear that gives security to the motorcyclist and abstains from driving drunk. Detects mishap and alerts the motorcyclist about mishaps and avoids speeding and develops an Android application to screen the motorcyclist and send ready SMS.

## II. PROPOSED SYSTEM

This document describes the keen headgear model, which ensures the wellbeing of the motorcyclist. Here the framework is liable for the following functionalities.

- We propose the framework which won't permit the motorcyclist to begin the vehicle if the motorcyclist isn't wearing a headgear.



- We propose the framework that detects alcohol consumption, if the motorcyclist has expended liquor, the motorcycle won't turn over.
- When you encounter an mishap, framework recognizes it and advises the enrolled contact with a location and image information.
- We propose the framework to guarantee the motorcyclist does not surpass as far as possible, an audio warning alert will be issued to the motorcyclist and precautions will be taken.
- We propose the framework where the motorcyclist must receive immediate medical assistance and make the motorcycle track capable of being manageable in case of theft or robbery.
- We propose a framework that comprises of a buzzer that helps the motorcyclist to abort when the motorcyclist does not encounter a major mishap.

### III. SYSTEM DESIGN

The framework comprises of two modules which is the user and administrator module. The user module comprises of an Android application where you used to send the notice to the motorcyclist and the close by specialists. The administration module comprises of two areas:

- A. Helmet section
- B. Bike section

#### A. Helmet Section

Helmet section comprises of push button, RF transmitter/ transceiver, Bluetooth headset module, speakers, microphone, Bluetooth module and so on.

##### a) Alcohol Sensor

The alcohol sensor (MQ7) is utilized to decide whether the motorcyclist is drunk or not. On the off chance that the motorcyclist is drunk, the value that is greater than the threshold is obtained, and therefore the motorcyclist is determined to be drunk. It is a minimal effort, high affectability to liquor semiconductor sensor that provides a quick response and gives both computerized and simple yield.

##### b) Accelerometer

It is a coordinated circuit that is utilized to gauge the increasing speed concerning the object where this accelerometer is connected. Here we utilize this accelerometer to detect mishaps when placing it on the headgear and it can be distinguished by inclining the headgear concerning the ground.

##### c) Bluetooth Headset Module

The motorcyclist can pair their phone with the Bluetooth headset module and noting the crisis call and speak into the microphone. So this module helps to keep away from interruption of attention from the road.

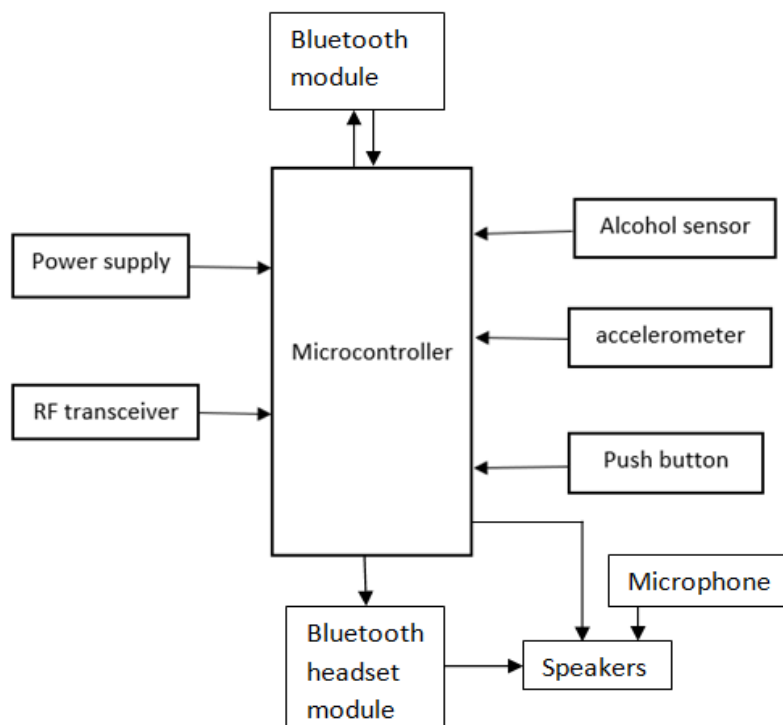


Fig 1. Helmet section

### B. Bike section

Bike section comprises of fingerprint module, buzzer, Bluetooth module, raspberry pi, power supply, LCD display, pi camera, relay and ESP\_01, IR sensor for speed detection and so on.

#### a) Raspberry Pi

Raspberry Pi runs multiple programs at once. Raspberry Pi used to control the motorcycle ignition system. When the motorcyclist starts the motorcycle, the Raspberry Pi will turn on and start to boot. Raspberry Pi captures the images with the assistance of the pi camera and then processes it.

#### b) Pi Camera

The Pi camera captures images of where the motorcyclist is in a mishap and sends the images and location to the person concerned through the mail.

#### c) IR Sensor

When an IR wave is emitted and received when there is a snag or object. Here the obstacle is the driving wheel.

When the IR wave is received, it sends a digital signal as a clock sign to the microcontroller. Therefore, the quantity of clocks will be counted as the speed of the motorcycle. Here the speed is reduced for reference. That reference speed will be compared to 80 km/hr it will be monitored by the Arduino Uno microcontroller, if the reference speed above 80 km/hr is exceeded, an audio warning alert will be issued.

#### d) GPS and GSM Module

The GPS module comprises of an antenna for communication with GPS satellites. This searches for the area of the motorcyclist when it is not found or the motorcyclist encounters mishaps. Send the coordinates to the microcontroller. The additional microcontroller sends the location to the enrolled member using the GSM module. The GSM module plays a significant role, helping to send the location to the member in question in case of theft or mishap.

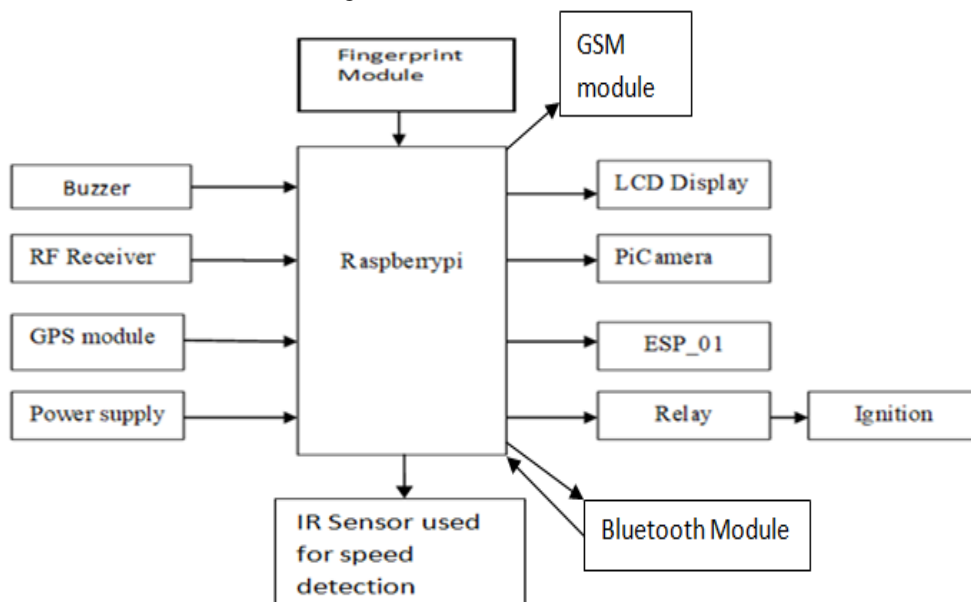


Fig 2. Bike section

## IV. IMPLEMENTATION

The execution of this framework provides very cheap and effective accident detection. The notification is given utilizing the Android app which is controlled by a management pack.

### A. Helmet section

When the motorcyclist has worn the headgear, the catch is squeezed. The alcohol sensor quantifies the

nearness of liquor in the motorcyclist breath. The accelerometer quantifies the inclination of the headgear. The yield of these section will go about as contribution for the microcontroller located in the headgear. The microcontroller forms the information and sends it to the bike section using an RF transmitter. The motorcyclist can pair their phone with the Bluetooth headset module and noting the crisis call and speak into the microphone and also keep away from interruption of attention from the road. The same is represented using Fig. 3.



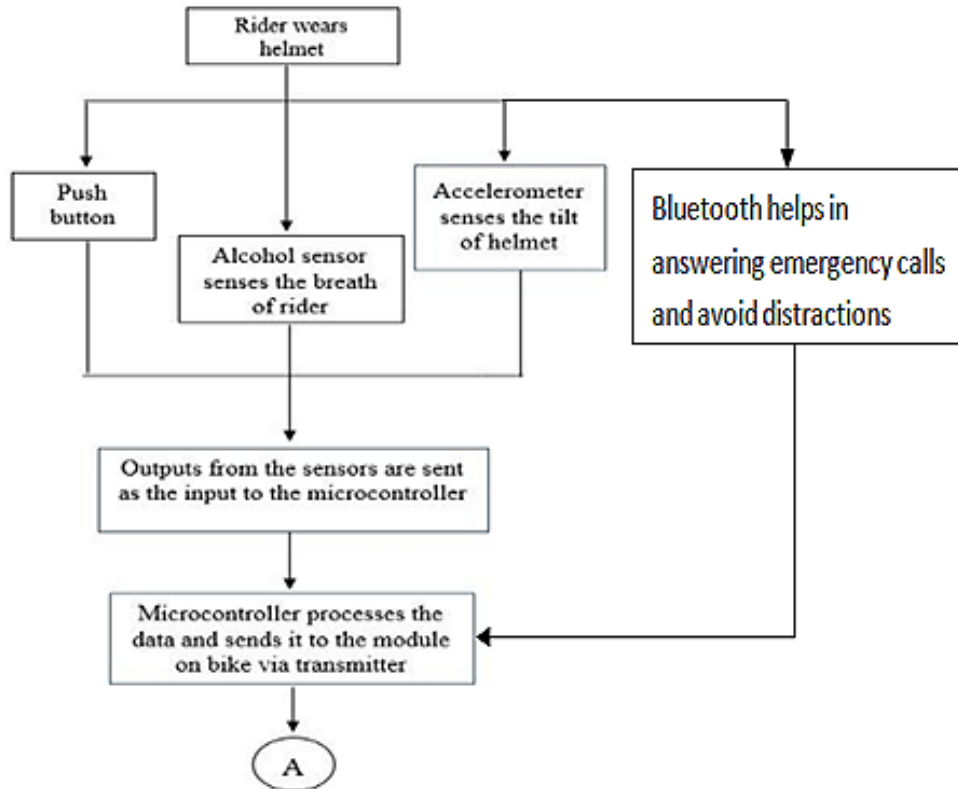


Fig 3. Flow chart of helmet section

### B. Bike section

The RF receiver gets the information and information is transmitted to the microcontroller. The microcontroller settles on the choice as per the yield of the headgear section. The helmet and the bike unit are associated to each other via Bluetooth.

There are two conditions to begin the motorcycle:

- The button must be squeezed when a motorcyclist uses the helmet.
- The motorcyclist must not be a drunkard.

At the point when the yield of the headgear section concurs with these two conditions, the start of the motorcycle will happen.

If the motorcyclist exceeds the speed (80km/hr) threshold, then the motorcyclist will receive the alarm message to back off.

At the point when an accelerometer gauges the tendency of the headgear concerning the ground as zero, it implies that a mishap has happened. A mishap notification

will be sent promptly to the enrolled number registered using GSM through the "ACCIASSISTO" application.

- The enrolled individual will receive the notification and then receives the location with image. They can then provide the immediate medical request and can also report the incident to the police station.
- If the mishap is minor, the driver can cancel notification of the mishap to the enrolled number with help of the buzzer. Fingerprint is used on the bike section to forestall robbery of the vehicle.

### C. Acci assisto

It is an Android application used to send notice to close by specialists. It involves a two-sided application, one is the guardian application and the other is the IoT side application where the individual experienced a mishap.

#### a) IOT side application

It is a user side application, here we have enrolled a pop-up contact number, so it sends the ready warning to the enrolled contact number about the mishap data and the mishap location area.

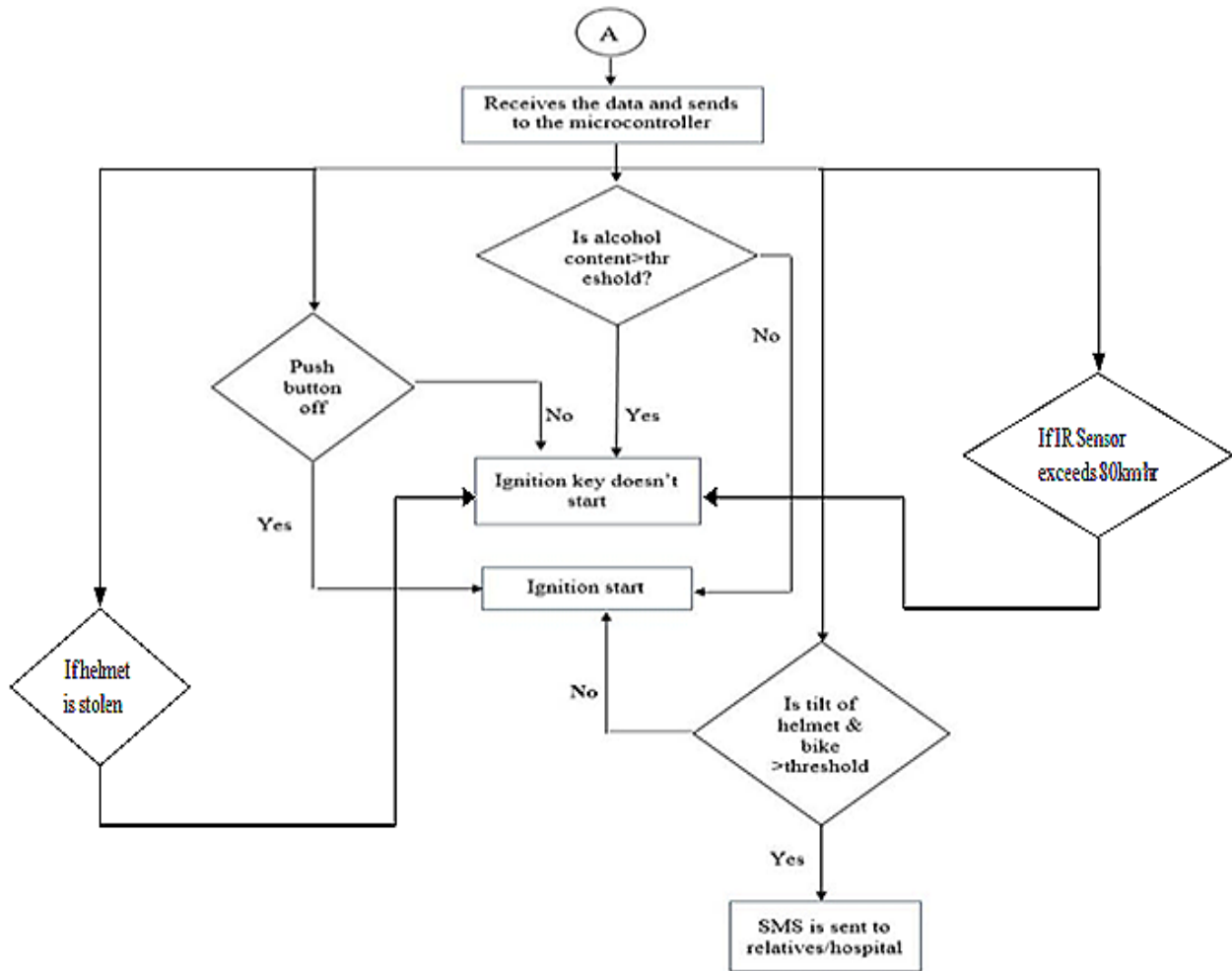


Fig 4. Flow chart of bike section



Fig 5. IoT side application



Fig 6. Guardian side application

*b) Guardian side application*

In the Guardian side application, here guardian get the ready notice of the mishap data with the area region and the picture of the mishap happened.

**V. RESULT**

The press button introduced on the head of the headgear will give a sign to the microcontroller that the motorcyclist is wearing the headgear, if the bike area doesn't get the sign from the press button, the start of the

bike motor won't initiate. If the motorcyclist evacuates his headgear during the ride, the motorcycle ignition will turn off.

The outcomes show that the framework had the option to recognize the mishap multiple times out of the multiple times where 15 were bogus positives, that is, an exactness of 94.82% was reached and sends the notice with the right and current directions 96.72% (266/275 ) of time. If the mishap is minor, the motorcyclist can cancel notification of the mishap to the enrolled number with help of the buzzer. This mishap location result depends on the inclination of the headgear. The motorcyclist can pair their phone with the Bluetooth headset module and noting the crisis call and speak into the microphone. So this, helps keep away from interruption of attention from the road.

Fingerprint is used on the bike section to forestall robbery of the motorcycle. IR Sensor helps in detecting the speed when speed exceeds 80 km / hr, the speakers present in the headgear emit an audio warning alert to hinder the motorcycle, thus avoid accident. The liquor sensor distinguishes the nearness of liquor in the motorcyclist breath, if the liquor content is detected, the bike start won't enact. The outcomes show that the framework identified the nearness of liquor in the motorcyclist breath multiple times out of multiple times.

## VI. CONCLUSION AND FUTURE WORK

The designed framework gives wellbeing and decreases the eventual outcomes of the mishap, informing about the mishap will give ideal consideration and treatment to the victim, reducing extreme effects on the individual. Fingerprint approval forestalls motorcycle robbery and gives security. Alcohol detection will avoid the scenario of driving under the influence in general and the motorcyclist himself. The Android application created for the framework will guarantee the best possible working of the framework. Monitoring the motorcycle speed will prevent speeding in rough driving and violation of traffic regulations. This framework can be utilized for without hands call gathering utilizing the Bluetooth headset module. In this way, this framework can save the life of the motorcyclist by 75% and provides medical assistance as soon as possible when the motorcyclist encounters an mishap, makes the motorcycle traceable when it is lost or not found.

The framework can be improved by adding the safety pin given by the authorities to unlock the motorcycle if the headgear unit is lost or tampered with. The mobile app will also be developed to track the motorcycle and headgear. The mobile application can also monitor the entire framework.

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