# Smart Helmet Using IoT

**Ravva Nithin[1], Samara Simha Reddy[2], Sana Dheeraj Reddy[3], Sharat SK[4],
Gopal Krishna Shyam[5]**

[1,2,3,4,5]School of C&IT, Reva University, Bangalore, India
[1]nithinravva4044@gmail.com, [2]saramasihmareddy.n@gmail.com,
[3]s.dheerajreddy1998@gmail.com, [4]sharatkattimani1@gmail.com

## Abstract

Road crashes are growing every day because the bikers don't use helmet. Injuries can also happen. Most of the people choose motorcycles but not the cars as they are less expensive, better to place, convenient to use. There are over three seventy lakh people riding two wheels in our country. While usage is high, the percentage of two-seater crashes is more than the four-seater. Two wheels have higher vehicle accident occurrences than the four wheels. The impact in these incidents is more severe if the rider is engaged in a big speed crash not wearing any protective wear like helmet. Wearing the helmets would also reduce this number of fatalities and can save lives.

The project wants to prevent collision as well as to enhancing and detecting of helmet detection unit. The sensor stitched on the helmet synchronizes with the sensor on the motorcycle which ensures that helmet is worn by the motorcyclist.

## 1. Introduction

The program is designed to have the motorcycle riders with total protection. Helmets have actually been made mandatory and still people drive without helmets. Number of road accidents has been increasing more in the past few years With the increase in motor vehicle accidents a proposal for reducing traffic deaths is now required. WHO says our country follows only two of the frontiers in seven in safeness of the vehicle. Motorbikers are responsible for twenty five percent of the road crash fatalities. About seventy five percent of accident affected motorcyclists hate wearing helmet. The primary reason of the deaths is people who drive on bikes alone under driving drunk and law breaches that lead to major crashes. "Survival risk of life threatening to wear helmets is higher compared to those who do not wear a helmet".

In this project, module will be helmeted to provide weather to the person wearing the helmet. Bike module lets the driver start the bike as long as the unit detects the indications from the helmet part. Helmet data is transmitted via the wifi-module to the cloud/database. Bike crash analysis is conducted using an sensor known as accelerometer the same condition is submitted for further action to the web/database. In the helmet disposal helmet, 3 hauling the vehicle, and after receiving signals from the helmet the controller count is zero to regain 3 vehicle positioning opportunities during helmet loss.

## 2. Related Works

[1]Previously there was a Bluetooth module which was less advantageous than the smart helmet because the designed system has a cloud connection and there will be no message sent to the emergency contact if Bluetooth doesn't work.

[2]Rash driving detectors have also been installed in the bikes Which detects the speed of the bike using a sensor known as accelerometer and the bike will be terminated when it exceeds a certain speed limit.

[3]Ultra sonic sensors have been implemented in the smart helmets which would give series of vibrations when the vehicles come very closer to the bike in high speed and cautions the rider.

[4]In here they developed a helmet system which detects a rider drunken or not and the vehicle will not start unless the driver do not have alcohol content present.

[5]The statistics of the deaths of the two wheelers has been done here which has the major proportion in accidents occurred. As a result of this statistics we came

to conclusion that wearing a smart helmet will be more helpful to save the life.

## 3. Proposed Scheme

Internet of things-based Helmet is budget-friendly system for protecting a motorcyclist's health and protection in road crashes. The conceptual smart helmet avoids  traffic of the traffic and detection of alcohol and that would be able to identify the biker and send Gps location to a predefined number on a regular basis. This also detects crashes and can send the message to a previously defined number. Microcontroller, sensor detecting positon, sensor detecting alcohol, Radio frequency transmitter, Internet of things,  receiver of the gps, power source are included in the system.

We build a program here, which always tests the two conditions before a rider starts cycling. The first one is to whether  the rider wears a helmet or do not wearing it and is subjected to a sensor of position. The second criterion is the measurement of alcoholic content in the soul of the rider, using alcohol sensors. The Microsoft control unit present in helmet gathers and processes data using frequency at which the radio is transmitted to the section of the bike. An RF receiving unit on the part of the bicycle receives the data and is moved to the motorcycle to monitor the ignition will be off. When all of the above mentioned conditions didn't met then the motorcycle engine will not operate, and the chirp noise will reflect this. Unless the rider wears a helmet and there is no alcohol trace available after which attention to the engine starts.

## 4. Methodology

### • Vehicle unit:

PIC Microcontroller   connects the RF receiver, Wi-fi unit,lcd, switch, sensor known as Infrared, relay placed, DC motor and sound module as given below.

• As soon as the vehicle microcontroller, LCD, connects the power the WIFI will be activated.

• When power turns ON, the LCD will show as "wear helmet please". Once the helmet is worn by the driver, the helmet part will forward the Radio Frequency signal which allow the vehicle to be ignited with the Ignition switch.

• When the vehicle is not receiving a signal from the helmet device, the operator does not allow driver to use the Ignite switch to turn the engine on.

• IN case of the helmet loss, emergency button can be used to start the engine by pressing the button for 5 seconds continuously for only to a certain limit of three times.

• If the vehicle part acquires an alcohol identification signal from the helmet part, the device raises the warning sound for five seconds and the vehicle Switches Off for another five hours.

• Infraredsensor is being used for detecting collisions and the sensor known as accelerometer is used to monitor vehicles dropping.

• If an accident has been identified, the status of the accident will be sent to cloud, which will in turn initiates a message with the accident details and the same message will be sent to the emergency contact.

### • Helmet Unit:

As mentioned below in block diagram Radio frequency transmitter will be connected for Alcohol Sensor and Touch Sensor.

1. If the Sensor detects alcohol from rider, then the sensor forward active signal to the Radio Frequency transmitter.

2. If the user wears the helmet then the  Infrared sensor will send an signal to the Radio Frequency transmitter that the rider wore a helmet and in turn this activates the engine .
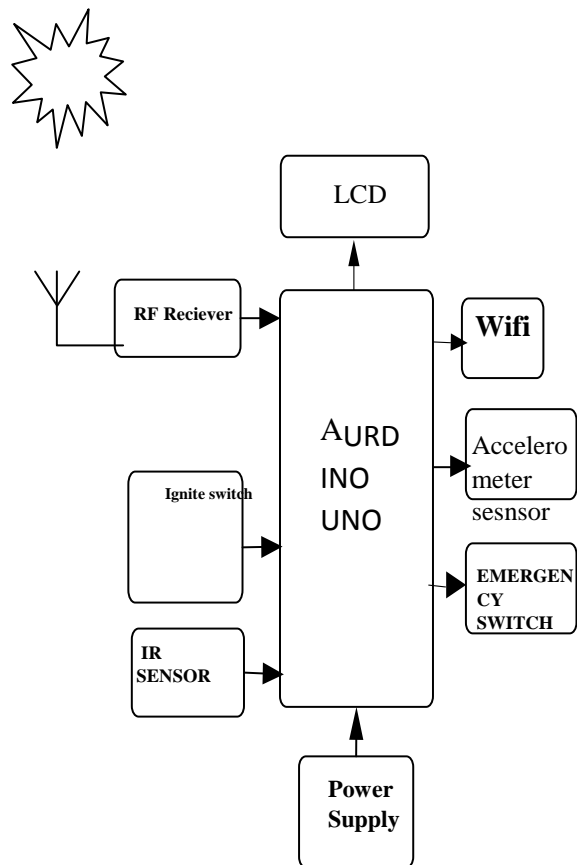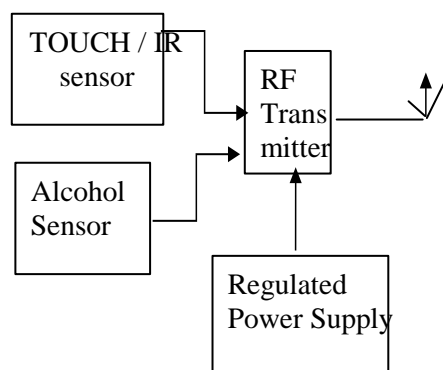


Figure 1: Vehicle Unit

Figure 2: Helmet Unit

**Application and Features:-**

• In real time we can be using this in a safety system.

• Implementation of the whole circuit can be later integrated into a small package.

• This protection feature has lower power consumption.

• We will incorporate this protection feature in vehicles for further use.

• Vehicle ignition model only works after obtaining signaling from the helmet via radio frequency module.

• Helmet wore state and driver drank is tracked. Depend in from the above state motorcycle, the same vehicle that is imported for cloud and the server is allowed to monitor the user position when driving to drive safely.

• Start the vehicle by manual switch when the helmet is missing.

## 5. Result

With the help of a helmet detection unit, the driver outside helmet can be avoided. If the passenger is not wearing a helmet then LCD will display it as "NO HELMET WEARED".

### Alcohol detection unit:

Frequency generated depending upon the vibration produced due to accident or fallen vehicle .If the frequency is greater than threshold value then vehicle unit displays "Bike has fallen"as shown in figure 3.



Figure 3: Display of alcohol detection unit

**Helmet unit:**

When the sensor knows that there is an alcohol count then there will be an message sent to the radio frequency transmitter then the infrared sensor will be receiving signal that to trigger the engine start by the radio frequency transmitter.



Figure 4: Display of Helmet Unit

**Bike unit:**

As soon as the vehicle module logic analyzer, Display ,binds the power source, the wifi system could initialize. Once the voltage was seen it will be projected as Wear the Helmet. When the user places an helmet, the helmet component gives the radio frequency signal to cause the vehicle to be ignited with the ignite switch. If Vehicle encounters no input from the helmet package, the controller do not allow a person to power the vehicle using the ignition button. User repeatedly hold down for five seconds to switch engine on. This will be allowing the user to turn on maximum for the triple times. Vehicle module if there is an alocohol count then there will be an sound for an five seconds where the sensor known as the infrared will be detecting if there is an chance of the fallen vehicle and the message will be sent to the emergency number already present in the database taken which will alert the user contact.

## 6. Conclusion

The concept is designed utilizing standardized methods which is capable of generating the desired outcomes. With certain enhancements this can work efficiently as an interactive application. Technology is acquiring or producing considerable success in diverse fields, that's why tech kept on transforming from every now and then. Moreover, with using the microcontroller, several parts can be made to installed individually, that will be making the things combine that makes the existing process more functional. parts with a large diameter will be designed to make the thing run for significant time activities.

**Pie chart describing deaths of two wheeler's users those who didn't wear helmet:**

According to the report cited in India Today,4 persons do die an hour in country over not wearing an helmet.

In the year 2017, count of 48,746 two-wheeler people died in the road accidents. That accounts for the (35804) riders of them do not had helmet on their heads.

This tells us that importance that helmet have while riding and the smart helmet ensures there is an message sent to the emergency contact in case of accident.
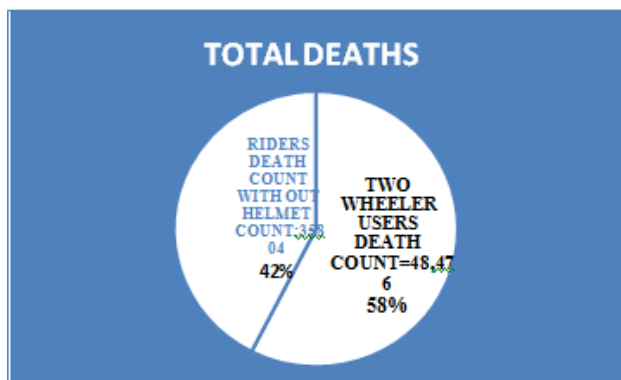
Figure 5: Statistics of people using two wheeler without helmet

**References**

[1]     Sayan Tapadar, Himadri, Nath Saha; Arnab["Detection of alcohol in Bluetooth enabled helmets"][2018 IEEE (CCWC)]

[2]     S.J. Swathi, Shubham Raj, D. Devaraj ["Microcontrollerand Sensor Based Smart Biking System for Driver's Safety"] [2019 (INCOS)]

[3]     Kalaiselvi V. K. G. ["Innovations in Bike Systems to Provide Safe Ride using IOT " 2017(ICCCT) ]

[4]     Divyasudha, N, Rajkumar ["Analysis of Smart helmets and Designing an IoT based smart helmet: A cost effective solution for Riders"][2019 (ICIICT)]

[5]     Amrutha, Lavanya,[" A survey on Road Accident Detection and Reporting"] Volume 7, 2016

[6]     Prashant Vaya ; Rajbala Simon ["Motorcycle Safety Solution using the Internet of Things"][2019 (ISCON)]

[7]     N Nataraja ; K S Mamatha ["Smart Helmet"]2018(RTEICT)

[8]     D. Selvathi, P. Pavithra, T. Preethi ["The Detection and prevention of accidents in the transport system"][2017 (ICICCS)]

[9]     P. Tharangai Thamil, S. Vanitha[ "Survey on Rash Driving Detection Using Acceleration and Orientation Sensors" ] [ISSN 2278 – 0882 Volume 4, March 2015]

[10]    Rashmi Vashisth, Sahil, Prasad, Rana ["Implementation and analysis of smart helmet" ][2017 (ISPCC)]

[11]    Sreenithy Chandran, N Edna Elizabeth ["Konnect: An Internet of Things(IoT) based smart helmet for accident detection and notification"][2016 (INDICON)]

[12]    Hemendra Kumar, Mohit Kumar,[ "Smart Helmet for Two-Wheeler Drivers"],[Volume. 02 Issue.05, May-2016.]

[13]    Prajitha Prasad A, Reshma Mohan,["Smart Helmet and Intelligent Bike System"],[ ISSN: 2393-8374, 2394-0697, VOLUME-5, ISSUE-5, 2018]

[14]    Amrutha Madhusan, , Vaishnavi Ravindran[" A survey on Road Accident Detection and Reporting"][Volume 7, Issue 4, April-2016]