

# Smart Driving System for Human Safety with Help of Advanced Microcontroller and Zigbee Technology

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**Abstract - For the past few years, many people are suffered and died due to road accidents. These accidents are caused because of drunken people and mainly due to riding high speed. The probabilities of two wheeler accidents are increased randomly day to day. Main motive of this paper is reducing these accidents by providing safety device which is integrated with the smart helmet. Some other problems are arises because of improper wearing of helmet. This system also used to reduce the rate of vehicle theft. This method is developed by using zigbee technology and sensors like gas sensor and IR sensor. Gas sensor is used to detect whether the person drunken or not. IR sensor is used to predict the person wearer the helmet or not. If the person didn't wear, the bike will not start. The ignition system gets OFF, due to the person who is consumed alcohol. When a person needs to start the vehicle, he or she should provide password. Any accidents occur, the information is sending to nearest hospital by GPS and GSM module.**

**Keywords:** IR, GPS, GSM, Zigbee, Advanced Microcontroller, Smart Driving, Human Safety.

## I. INTRODUCTION

A site visitor's coincidence is characterized as any automobile twist of fate occurring on public highway roads. The need of developing this little occurs for each one hour due to motorcycle injuries. The essential cause is drunken drive. It's far mentioned that most of the people of avenue injuries are came about only due to drunken drive. It has also been determined that other 30% of injuries are due to wrong utilization of helmet. That is one of the foremost issues faced with the aid of the community. The main purpose this technique is to build a safety system that is included with the smart helmet and sensible motorbike to reduce the possibility of two-wheeler accidents. This proposed technique consists of arduino microcontroller, IR sensor, alcohol sensor, RFID tags, helmet module and motorbike module.

This system essentially consist of main modules essentially a helmet module and a bike module. Helmet

module includes IR sensor, alcohol sensor and microcontroller. IR sensor is constant within the bottom of the helmet which is used to discover the presence of helmet on the rider's head. If the IR sensor does not sense the presence of helmet at the rider's head, the ignition of the motorcycle is turned off mechanically the helmet is used to detect whether the rider has fed on alcohol or now not, if yes, it will be detected with the aid of the alcohol sensor and the ignition device gets off routinely.

The motorcycle will start until the rider wears the helmet and if there is no alcoholic content present. Every command and commands inside the helmet module are controlled by the microcontroller. This proposed technique also includes a completely unique function thru which the robbery of bike can be decreased. Radio Frequency identification tags (RFID tags) are used for security reason while the tags are scanned thru the reader it scans the details present in the reader and fits with the tag. Once the data is matched the get right of entry to is given. The device then asks for the password which is ready by means of the riders for accessing the bike. Whilst the RF tag does in shape with the records present within the reader then the beep sound could be turned on giving alert to the rider. By way of this way the discount of motorbike robbery is viable. Tact switches are used to go into the password.

The Zigbee technology, international Device for mobile conversation (GSM) modules, GPS Modules and modern-day excessive speed microcontrollers to gain The favored outcomes. The primary goal is to perceive the Coincidence, for this we enforce a speed sensor and Accident sensors within the vehicle, the coincidence is detected and Using the zigbee generation it sends the vicinity of accident To the manage unit and the manage unit ship this Information to the nearest hospitals around the twist of fate area. From the health center an Indication is sent to the alternative hospitals that an ambulance.

There are four predominant programs this proposed methodology will cope with. Initially it assessments the presence of helmet on the rider's head that is the obligatory step to ignite the motorcycle engine. Secondly it checks

whether or not the rider has ate up alcohol or no longer. Then it has a RFID tags and password authenticated machine which is used to at ease the bike from the robbery. Subsequently, if any coincidence to send the message to nearest sanatorium at the accidental location.

The motorcycle module consists of micro controller, relays and alarm unit. When the alcohol is detected by using the fuel sensor or the rider do now not put on the helmet, relays gift within the bike module is used to cut the ignition of the bike. Alarm machine encompass a buzzer which turns on whilst the fuel sensor detects the presence of alcohol ate up through the rider and whilst the incorrect RFID tags had been used for the getting access to of the motorcycle.

## II. LITERATURE SURVEY

V. Melcher, F. Diederichs, R. Maestre [1] is a dictation which creates a real Time Site visitors accident Detection machine (RTTADS) the usage of Wi-fi Sensor networks(WSN) or Radio Frequency Identity (RFID) technologies. Reference [2] goals to alert the close by clinical middle in regard to the misadventure to Provide instant medical aid. The partial accelerometer In the automobile senses the lean concerning the automobile or the heartbeat Sensor on the user’s frame senses the abnormality of the Heartbeat in imitation of recognize the regarding the accident. For this reason the structures choice accomplish the selection and sends the Statistics after the phone, associated with the Accelerometer and pant sensor, thru Bluetooth.

Reference [5] is a site visitors go along with the waft government system up to expectation makes use of Wi-fi Sensor Networks (WSN) in imitation of tracking the visitors Float sequences. WSN is persistent so device to device and Control visitor’s indicators whilst an clever web site visitors controller Is developed after manage the method of the site visitors Infrastructure supported by way of the WSN.

## III. EXISTING SYSTEM

Existing system of this paper consistent with enhance the protection concerning the motorcycle’s rider thinking of RF transmitter or RF buyer circuit. This notice demand bill makes use of ARM7, GSM or GPS module. This mention additionally utilizes buzzer due to syndrome purpose. This paper is merely ripe regarding solely certain unique reason thereto amount is an accident. Whenever the mishap wish takes place longevity after mishap point will stay remember down and knowledge choice sends abroad about the observed mobile variety stability.

## IV. PROPOSED SYSTEM

### 4.1 Block Diagram

In the proposed system we usage quite number sensors like speed sensor or accident sensor in accordance with observe the occurrence of accident, then utilizes GPS yet GSM modules due to vehicle-to-hospital and hospital-to-hospital communication. Zigbee is used for long reach communication.

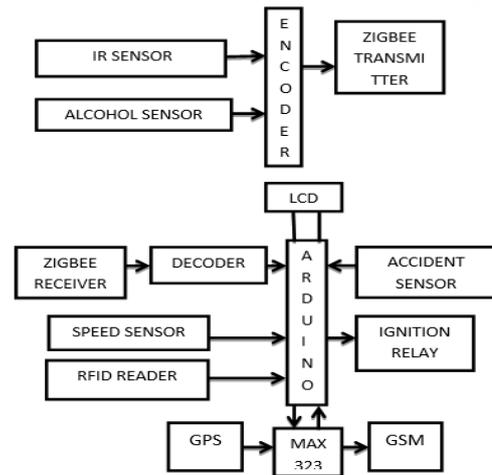


Figure 1: Block diagram of proposed system

### 4.2 Working Principle

The reasonable head protector gadget depends on zigbee technology, which joins of transmitter portion and a collector stage related to the encoding and decoding units.

### 4.3 Hardware details

#### 4.3.1 Zigbee Technology

The transmitter portion is put inside the protective cap and the recipient fragment is put in the motorbike and is immediately associated with its start machine.



Figure 2: Zigbee module

Various sensor switches which are connected in equal setup are fitted inside the head protector to check whether the rider has put on the cap.

### 4.3.2 Alcohol Sensor

An alcohol sensor is fixed in the mouthpiece of the protective cap to go over the nearness of liquor in the rider's breath. The liquor recognition circuit begins routinely once the protective cap is put on.



Figure 3: Alcohol sensor

The yields of both the exchange and alcohol sensors relate to the control alarms to be transmitted by means of the encoding unit. In the collector stage, the ideal sign originating from the encoder for the protective cap move and the alcohol sensor is decoded and is utilized to begin or hinder the vehicle. The vehicle begins easiest if the sign like the protective cap switches is over the top and the liquor mindfulness is under as far as possible. On the off chance that any of the above conditions aren't satisfied, the start gadget could be impaired.

### 4.3.3 GSM and GPS module

The standard contains on a zigbee transmitter, zigbee transmitters are inserted internal the dashboard concerning the vehicle at some phase in the specialized of the vehicles.



Figure 4: GPS module

Alongside that an influence sensor, a mishap sensor, GPS and GSM modules are likewise inserted among the format in regards to the vehicle.

### 4.3.4 Arduino Microcontroller

At the age concerning mishap, the vehicle shows strange vibrations yet likewise that gets tilted (the capacity of the vehicle gets changed each evenly or vertically) these variations from the norm are detected at that point dispatched to the ARDUINO microcontroller.

The accident sensor detects the tilting of the vehicle and recognizes the occurrence with respect to the mishap, when the mishap is distinguished the utilization of the GPS module the cutting edge district on the vehicle is recorded.



Figure 5: Arduino Microcontroller

GSM sends that recorded mishap area as per clinics of the SMS design. Zigbee is utilized in view of far range correspondence, with protection around 100m. In this way the region with respect to the mishap through SMS is sent by the near to emergency clinics inside x kms extend.

At the clinic side the zigbee handset is actualized. It gets the territory information sent by methods for the zigbee transmitter situated concerning the vehicle at that point checks stipulation the rescue vehicle is close by at the medical clinic, salvo present the rescue vehicle want dispatch or goes to the scholarly region of mishap, as per maintain a strategic distance from more than one ambulances at the mishap site the sending facility utilizes switch and sends a code after the other medical clinics so much the rescue vehicle is creature dispatched past that emergency clinic.

## V. RESULT AND DISCUSSIONS

Before the emergency vehicle should dispatch at the wellbeing office out of the medical clinic a watched is dispatched in impersonation of the near to site guests limit cell utilizing the switch due to clearing the traffic between the way inside the emergency vehicle and the mishap area.

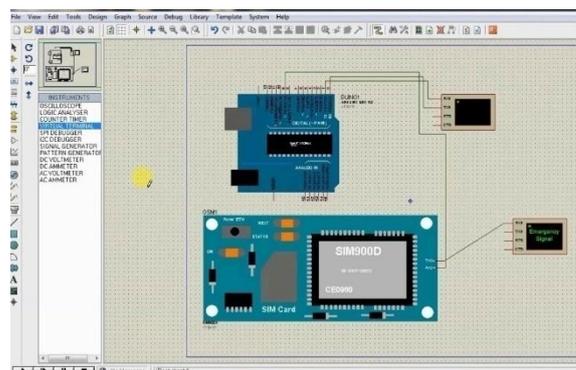


Figure 6: Simulation design in Proteus software

What's more, we may have considered numerous occasions the spot sufferers show up at the wellbeing community between a very fortuity state, anyway because of insufficiency with respect to offices over taking care of such occurrences and because of any lousy reason that desire stay prompted by move to another wellbeing office as comprises

about higher offices, into such cases, anything may happen as per the patient while voyaging from one emergency clinic after another.

To maintain a strategic distance from this, by methods for the use of the equivalent equipment as is applied at the wellbeing office viewpoint an articles is sent in congruity with each other sanatorium in similarity with who the influenced individual was consistent with go, whole the significant focuses over the sufferers sort of the wellness stipulations are sent even before the influenced individual shows up there, and when they show up prompt cure perform stay provided notwithstanding some reach out in time.

## VI. CONCLUSIONS

Here the fundamental goal is to spare life by giving correspondence from the site of mishap to the emergency clinic without human interface. From the examination and work done in this respect the framework serves to be useful in sparing lives. The present framework likewise utilizes the most recent innovation. From the examinations conveyed and perceptions done, framework is viewed as dependable and exact. The results acquired are steady and works under various conditions. This venture fills in as a base for additional improvements.

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