

# IMPLEMENTATION AND ANALYSIS OF RIDERS USING SMART ARMOR

Ch.Gopala Krishna<sup>1</sup>, M.Pavani<sup>2</sup>, J.Rupa Satya Sri<sup>3</sup>, B.Nandini<sup>4</sup>, Hyder Hussain<sup>5</sup>,  
K.Rajesh<sup>6</sup>

<sup>1</sup>Assoc. Professor, <sup>2,3,4,5,6</sup>UG Students

From Dept. of Electronics and Communication Engineering, Sree Vahini institute of Science  
and Technology, Tiruvuru, AP, 521235

## ABSTRACT

In this paper which ensures the safety of a two-wheeler rider. The primary concept behind the working of the system is that the ignition of a two-wheeler will be enabled only if the rider is wearing a helmet and not consuming alcohol. An alcohol sensor and helmet wearing sensitive switches are installed inside a helmet, which is connected to the motorbike. A fully functioning prototype of the reported switch based helmet system has been fabricated and all the necessary circuits are embedded inside the helmet and the motor bike. The proposed system has the unique characteristic of transmitting the appropriate condition of the signals for a predefined duration followed by holding of these signals for the rest of the time at the receiving end for the proper functioning of the motorbike. Also, the alcohol detection circuit is automatically shut "OFF" after a predefined time. If anybody want to start the bike compulsory he can wear helmet and doesn't take alcohol, if these conditions done success engine will start otherwise it will give buzzer alert.

**Keywords: Vibration sensor, Mq3, Thingspeak, Esp 32, Wi-Fi & Internet of Things.**

## LINTRODUCTION

Driving under the influence of alcohol has affected and killed countless of people's lives. If you drink and drive, not only do you possibly put yourself at risk, but your passengers and pedestrians, and other people, who were on the roads. Just think about that. Every thirty minutes someone's life is cut short and families are devastated. So, here we implemented a prototype version Alcohol Detection system in order to control drunk and driving as much as we can. Please follow the link [To Know about Different Types of Sensors with their Applications.](#)

The Alcohol Detection system works on a simple principle, if a driver has been drinking, the alcohol breath analyzer sensor will detect the level of alcohol in the driver's breath and if it crosses a set threshold, an alert will come and the vehicle engine will stop immediately. This project is designed for the safety of the people seating inside/outside the vehicle.

## **II.LITERATURE REVIEW**

**Keesari Shravya [1]** has proposed a system to identify whether the rider worn the helmet or not. If the rider worn the helmet then ignition will start the engine otherwise it remains off. For this, Force Sensing Sensor sensor is used. The second step is alcohol detection [2]. Alcohol sensor is used to detect the presence of alcohol in rider's breath and if it detects ignition cannot start.

**Navya Sri K [2]** proposed a system with GPS and GSM for accident detection. It uses push button to detect an accident and if the accident occurs location will be sent to the contact list saved in EEPROM. H.C.

**Impana [3]** has given a method method proposed using microcontroller RF transmitter and other sensors is cost effective but we find the system proposed using Raspberry pi module, Pi camera, Pressure Sensor, GPS system which uses image processing algorithms is most useful since the image processing is included so that we can easily detect the helmet from the rider.

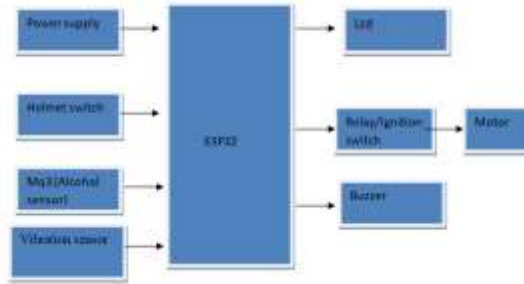
## **III. EXISTING SYSTEM**

In today's era, especially in the young generation, the craze of motorbikes is really remarkable. The middle class families prefer to buy motorbikes over 4-wheelers, because of their low prices. As the bikers in our country are increasing, the road mishaps are also increasing day by day, due to which many deaths occur, most of them are caused due to most common negligence of not wearing the helmets. This motivates us to think about making a system which ensures the safety of biker, by making it necessary to wear helmet, as per government guidelines.

## **IV. PROPOSED SYSTEM**

The helmet is being design in such a way that if the biker is drunken bike won't start. There is alcohol detector which will detect alcohol. This smart helmet is also used for the ignition purpose, speed of the bike is being affected because the helmet, so this is the smart n safety helmet for a biker that has been design for reducing the accidents which are increasing.

## **V.BLOCK DIAGRAM**



## ESP 32



ESP32 based boards come in a variety of shapes and sizes and pinout of each board is different to other. Also, not all pins of the ESP32 Microcontroller SoC will be available on a development board as some pins might be permanently tied to a dedicated function.

One such case is the Flash Memory. We know that all ESP32 boards come with 4 MB of Flash Memory to store the programs. So, some of the GPIO Pins (6 to be specific) are connected to SPI Flash IC and those pins cannot be used as regular GPIO Pins.

## WIFI MODULE (ESP8266)



The ESP8266 WiFi Module is a self contained SOC with integrated TCP/IP protocol stack that can give any microcontroller access to your WiFi network. The ESP8266 is capable of either hosting an application or offloading all Wi-Fi networking functions from another application processor. Each ESP8266 module comes pre-programmed with an AT command set firmware, meaning, you can simply hook this up to your lpc 2148 device and get about as much WiFi-ability as a WiFi Shield offers (and that's just out of the box).The ESP8266 module is an extremely cost effective board with a huge, and ever growing, community.

This module has a powerful enough on-board processing and storage capability that allows it to be integrated with the sensors and other application specific devices through its GPIOs with minimal development up-front and minimal loading during runtime.

### **MQ3 SENSOR**



This module is made using Alcohol Gas Sensor MQ3. It is a low cost semiconductor sensor which can detect the presence of alcohol gases at concentrations from 0.05 mg/L to 10 mg/L. The sensitive material used for this sensor is SnO<sub>2</sub>, whose conductivity is lower in clean air. Its conductivity increases as the concentration of alcohol gases increases. It has high sensitivity to alcohol and has a good resistance to disturbances due to smoke, vapor and gasoline. This module provides both digital and analog outputs. MQ3 alcohol sensor module can be easily interfaced with Microcontrollers, Arduino Boards, Raspberry Pi etc.

This alcohol sensor is suitable for detecting alcohol concentration on your breath, just like your common breathalyzer. It has a high sensitivity and fast response time. Sensor provides an analog resistive output based on alcohol concentration. The drive circuit is very simple; all it needs is one resistor. A simple interface could be a 0-3.3V ADC.

### **SWITCH**



Switch (ON/OFF button) A switch is an electric mechanism for ON/OFF the device, it is used to regulate the flow of electricity by interrupting or diverting the current from one conductor to another. This switch is placed inside on top of the helmet and it is pressed when the rider wears the helmet and it released when helmet takes off. Based on the switch condition the bike ignition key will be ON/OFF

### **VIBRATION SENSOR**



The vibration sensor is also called a piezoelectric sensor. These sensors are flexible devices which are used for measuring various processes. This sensor uses the piezoelectric effects while measuring the changes within acceleration, pressure, temperature, force otherwise strain by changing to an electrical charge. This sensor is also used for deciding fragrances within the air by immediately measuring capacitance as well as quality.

### **Vibration Sensor Working Principle**

The working principle of vibration sensor is a sensor which operates based on different optical otherwise mechanical principles for detecting observed system vibrations.

The sensitivity of these sensors normally ranges from 10 mV/g to 100 mV/g, and there are lower and higher sensitivities are also accessible. The sensitivity of the sensor can be selected based on the application. So it is essential to know the levels of vibration amplitude range to which the sensor will be exposed throughout measurements.

### **RELAY**



A relay is an electrically operated switch. Many relays use an electromagnet to operate a switching mechanism mechanically, but other operating principles are also used. Relays are used where it is necessary to control a circuit by a low-power signal (with complete electrical isolation between control and controlled circuits), or where several circuits must be controlled by one signal. The first relays were used in long distance telegraph circuits, repeating the signal coming in from one circuit and re-transmitting it to another. Relays were used extensively in telephone exchanges and early computers to perform logical operations.

### **DC MOTOR**

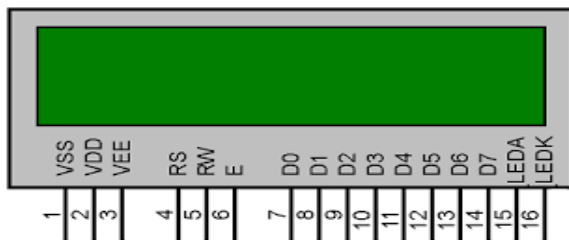


An electric motor is a machine which converts electrical energy into mechanical energy.

### Principles of operation

In any electric motor, operation is based on simple electromagnetism. A current-carrying conductor generates a magnetic field; when this is then placed in an external magnetic field, it will experience a force proportional to the current in the conductor, and to the strength of the external magnetic field. As you are well aware of from playing with magnets as a kid, opposite (North and South) polarities attract, while like polarities (North and North, South and South) repel. The internal configuration of a DC motor is designed to harness the magnetic interaction between a current-carrying conductor and an external magnetic field to generate rotational motion.

### LCD



It is called Liquid Crystal Display. We are going to use 16x2 characters LCD. This will be connected to microcontroller. The job of LCD will be to display all the system generated messages coming from the controller. LCD will provide interactive user interface. This unit requires +5VDC for its proper operation. This module is used for displaying the present status of the system.

### VI. EXPERIMENTAL RESULT

Finally after the design of system the input is identified by the sensor through the breath of a human. In the next scenario the levels of alcohol are measured by the sensor and compared with the set-in limits. If the set limit of consumption in alcohol is less than the alcohol consumed by the person the system of activating relay is initiated which in turn activates the automatic lock on the vehicle i.e., stops the motor if it is in running state or it is unable to start. We can also give a comparative report of study with the variables of considering the internal factors.

## **VII.ADVANTAGES**

1. The chance of loss of life and property due to drunken driving is minimized.
2. Simple implementation leads to accurate results.
3. Can be implemented on various types of vehicles.
4. less accidents, more safety.

## **VIII.APPLICATIONS**

- Can be applied at any weather conditions.
- Useful for college student.
- Useful for two wheelers.
- Help to protect life in accident case.

## **IX. CONCLUSION**

The developed system efficiently ensures. Rider is wearing helmet throughout the rider. Rider should not be under influence of alcohol, Accident detection & theft protection. By implementing this system a safe two wheeler journey is possible which would decrease the head injuries during accidents and also reduce the accident rate due to driving bike after consuming alcohol. A helmet is not being 100% fool proof but it definitely the first line of defence for the rider in case of an accident to prevent fatal brain injuries. The proposed approach makes it mandatory for the rider to use this protective guard in order to drive a two wheeler vehicle and ensures the safety of human brain and therefore reduces the risk of brain injuries and deaths in case of an accidents. Besides the developed system prevents the theft of two wheeler.

## **X. FUTURESCOPE**

- We can implement Heart Rate Pulse Variability to find accurately identify the driving behavior of drivers and to assist them.
- We can implement GPS technology to find out the location of the vehicle.

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