

# ARDUINO BASED SMART VEHICLE MONITORING SYSTEM

**K.Devi Priyanka<sup>1</sup>, Y Jyothi<sup>2</sup>, N Gayathri<sup>3</sup>, M Saila Bhanu<sup>4</sup>**

<sup>1,3,4</sup>Assistant Professor, Dept. of electronics and communication Engineering, VSM College of Engineering, AP, India  
<sup>2</sup>Associate Professor, Dept. of electronics and communication Engineering, VSM College of Engineering, AP, India

**Abstract** - Safety while traveling is everyone's main concern. This project presents the design of a suitable information system that can monitor the status of a vehicle that is passing by. This program is designed to get information about the location of the vehicle, accidents related to the vehicle for the families of travelers and the gas flow from the vehicle that is causing problems. This system uses an accelerometer sensor that can detect vehicle imbalances and vibrations when an accident occurs. This sends a signal to the microcontroller. The emergency information system works with GSM and GPS modems. Notifications are sent to a specific phone number. This tracking system consists of GPS receiver, arduino and GSM Modem. GPS Access Satellite data is available based on latitude and longitude. Arduino processes this information and sends this information to the user/owner of the GSM modem. A GSM modem is connected to the MCU. The temperature sensor is used to detect the temperature level and the leakage of harmful gases in the vehicle.

**Key Words:** ARDUINO UNO, GPS, GSM

## 1. INTRODUCTION

There are many deaths due to road accidents around the world. According to a recent study from IIHS it has been shown that these factors can be reduced by implementing the IOT system properly and on a promotional basis as well. It can reduce the number of deaths after accidents but we cannot control the behavior of drivers such as drunk driving and drug users. The joint experience used by various car manufacturers such as Tesla is one of the main reasons. The main purpose of the program is to reduce the number of people who died due to the lack of proper care at the right time. that is, the complete product must be produced with the help of the company. To do this, we need to reduce the size of the system and the cost of its implementation. It can be improved using ultrasonic sensors and cameras

## 2. LITERATURE SURVEY

The paper was published in IJDCST in March-April-2017, Issue-V- 5, I-3, SW-31 ISN number is 2320-7884. This function uses an accelerometer sensor that can detect

vehicle imbalance and vibration in the event of an accident. This sends a signal to the microcontroller. The car accident detection system works with GSM modem and GPS. A message is sent to the selected phone number. This navigation system includes GPS receiver, arduino and GSM Modem. A GPS receiver receives geo satellite data in latitude and longitude. Arduino processes this information and this information is sent to the user/owner using the GSM modem. The GSM modem connects to the MCU. A temperature sensor is used to detect the temperature level and the leakage of harmful gases in a vehicle.

## 3. PROPOSED SYSTEM

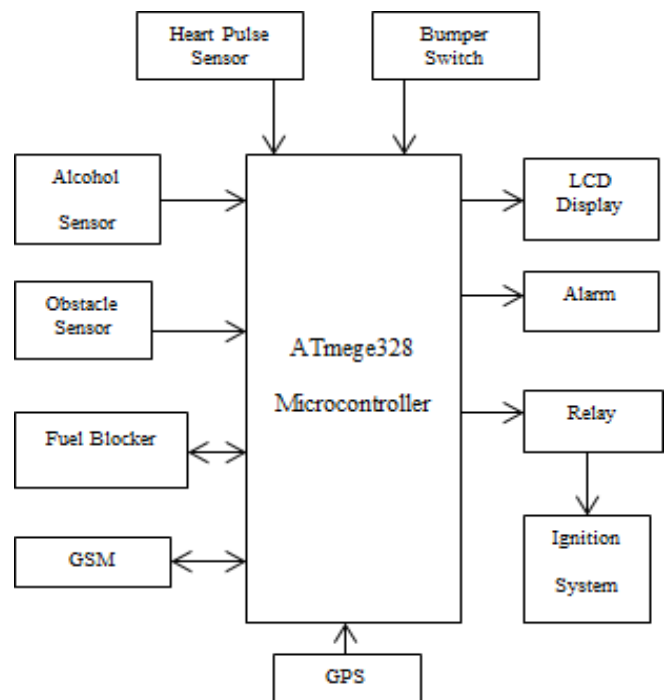
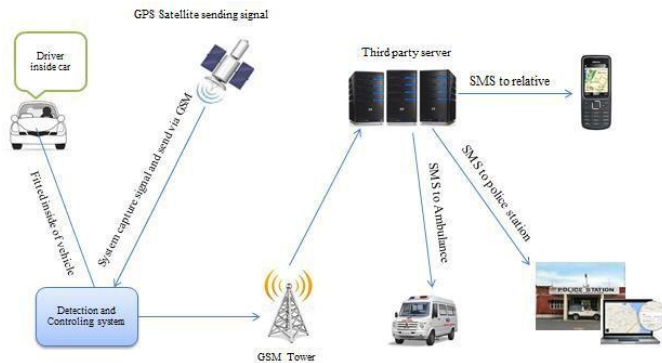


FIG 3.1 Block diagram

In the system that we have introduced, we have tried to identify the drunk driver and if they have been drinking, they should not be allowed to drive and report this drunk driver to the nearest police station which is struggling to identify a drunk driver and provide counseling. . Along

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with this process we will also look at the condition of the car inside and outside the car. Along with providing assistance to the driver in case of an accident by sending a message to the driver, the police station and the driver's family as well. Figures 1 and 2 show the block diagram of our system with the architecture.



In design, there are two parts like software part and hardware part. Software consists of embedded software that integrates different parts of the hardware like LCD display, microcontroller, sensor, GSM, GPS and so on, while the user-accessible equipment such as alcohol detector (MQ-3), GPS, GSM, obstacle detector, LCD display, fuel blocker, ultrasonic detector, heart rate monitor, bumper switch.

In this case, when alcohol is detected, two conditions are tested. The first is, if the driver is drunk, he wants to start the car while trying to start the car to recognize alcohol will be done at a speed of 0. If alcohol is detected, the signal is sent to the microcontroller and the car ignition will be stop immediately. So this prevents the driver from driving. The second situation that is faster than 0 or 2. It will happen that when the drunk wants to start the car from whom. So we also provide the system to cut off the electricity instead of stopping the electricity directly because the direct stop of the electricity for alcohol control will be dangerous because the driver is driving at high speed and will cause an accident. So, after the break, the drivers will put the car in the right position.

## 4. Block Diagram Explanation

### 4.1 Alcohol Sensor:-

The alcohol detector will detect the alcohol from the breath of the person (the driver) and send its value to the microcontroller. The breathalyzer (MQ3) is suitable for detecting alcohol just like a regular breathalyzer. It has a high sensitivity to low BAC values and a fast response time, it provides an analog product of alcohol-related resistance.

### 4.2 LCD Display:-

The LCD screen is installed inside the vehicle and this LCD screen serves as an indicator for the driver and other people sitting inside the vehicle. This display gives an indication of the alcohol level detected by the alcohol sensor, it also provides a warning message to the driver to stop the vehicle or the vehicle within a certain time after which the vehicle will stop automatically, indicating smoke/gas detection in the vehicle.

### 4.3 Fuel Supply Blocker:-

When alcohol is detected while driving, instead of turning off the ignition system directly while driving, the signal is transmitted to the fuel stop and the fuel supply is cut off. As a result, the fuel supply to the engine is cut off. Therefore, the engine stops working or does not start depending on the location of the vehicle.

### 4.4 Heart Pulse Sensor:-

In many cases, the accident is due to the increased heart rate and the reason the driver is affected. so we can inform other people sitting in the car about the health of the driver. The heart rate is a device that detects or receives the signal in the form of pulses and it determines the signal of the heart in beats per minute. There are two types of heart rate one is called bradycardia and another is called tachycardia. The usual thing. A man's heart beats 70 beats per minute and a woman's 75 beats per minute. If the heart rate detects the heart with an abnormal state of comfort, it means a high pulse so this signal will be given to the controller and the display of the corresponding message on the LCD with alarm and warning and sent to the family of the car and an ambulance.

### 4.5 GSM Modem:-

Here we use the GSM Modem 300, this GSM Modem can accept the SIM card of any GSM network like a mobile phone with its own unique phone number. Applications such as SMS Control, data transfer, remote control and access can be easily continued. The modem can be connected directly to a PC port or a microcontroller. Heart failure when detected, this message is sent to the family and the car, alcohol is detected and sent to the family and the police with the car and where to use the GPS network.

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#### 4.6 GPS (Global Positioning System):-

GPS is a global positioning system used to locate an object by latitude and longitude. We will use the GPS system to send the location information to the police and the family of the car when alcohol is detected and there is an accident and the location, Car No. They are sent to the police station, the family and the ambulance for immediate or urgent treatment. And the police can track down the driver if he is found to be drinking, punish him. The Global Positioning System (GPS) satellite navigation system is a network of 24 satellites in orbit. GPS works in all weather conditions of the world. There are no registration fees or system fees to use GPS. The GPS receiver must record the signal of three satellites to compare the 2D position (latitude and longitude) and track movement. With four or more visible satellites, the receiver can determine the user's 3D position (latitude, longitude and altitude). After calculating the vehicle's location, GPS can determine other information such as speed, distance to destination, time and more. A GPS receiver is used for this investigation to find the location of the vehicle and provide information to the responsible person using GSM technology.

#### 4.7 Microcontroller (ATmega328) :-

In this system we are using an Arduino board with additional features as there is an ATmega328 microcontroller which should be used to control the system. Arduino Uno is an ATmega328 based microcontroller board. The ATmega includes features such as 20MHz speed, 1.8-5.5 power supply, -400°C to 850°C operating range, and 32KB flash.

1KB EEPROM, 2KB RAM. Arduino has 14 digital input/output pins (6 of which can be used as PWM outputs),

6 analog inputs, 16MHz crystal oscillator, USB connection, power jack, ICSP header and reset button. Contains everything needed to support a microcontroller; Simply connect it to your computer via a USB cable or power it with an AC adapter or battery to get started. The Uno differs from all previous boards in that it does not use the FTDI USB-to-Serial Driver chip. Instead, it features the Atmega8U2 programmed as a USB-to-serial converter.

#### 4.8 Relay:-

The relay is used to turn off the ignition system by sending a low power signal to the ignition system. Only then the Alcohol Detected power signal activates.

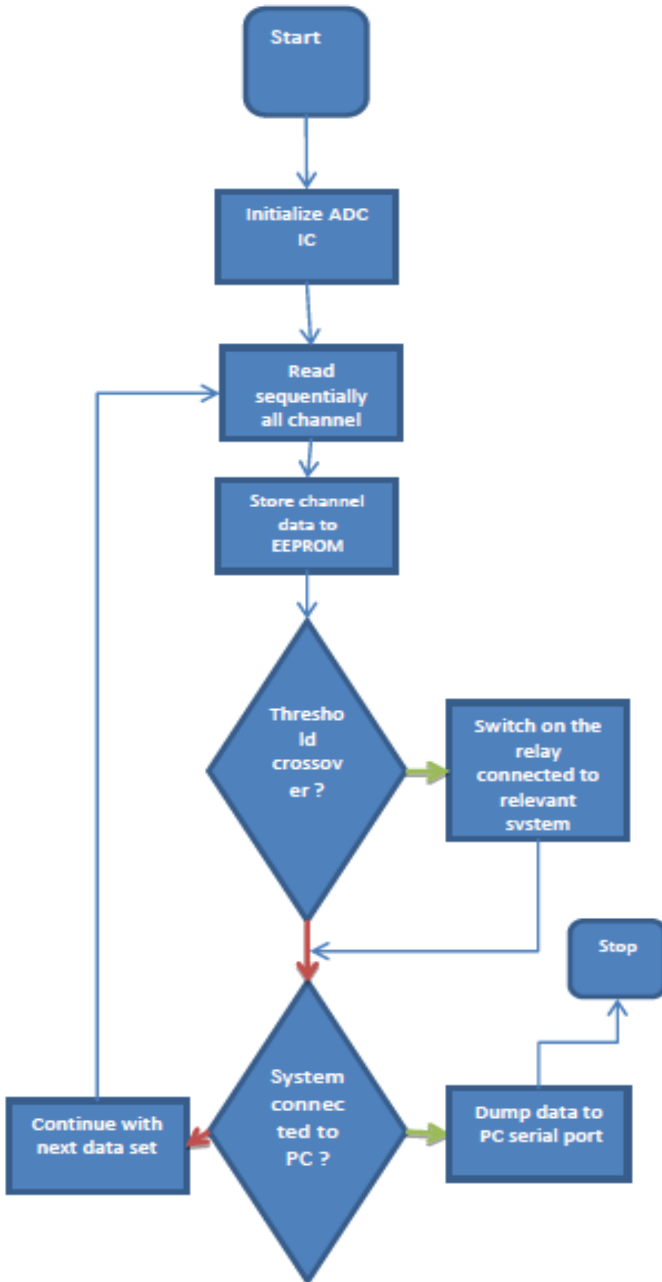
#### 4.9 Bumper Switch:-

The bumper switch is a type of switch that is an excellent sensor for collisions. Bumper switches act as push buttons. That is, when pressed, it becomes active and the microcontroller performs the action required for this state. This sensor is a very simple way to measure your crashworthiness in any situation. This switch is activated when another vehicle collides.

### 5. METHODOLOGY

1. Starting vehicle by driver.
2. Check speed of car.
3. If it is zero then start sensing by various sensor & notify detection. In this case alcohol is mainly checked if it detected then stop ignition.
4. If speed is greater than 2 kmph then again sensing started. Detection of various parameter will be sense by sensor & will be notify.
5. At a same time if alcohol is detected then fuel supply will be blocked.
6. Vehicle will be stopped & notify detection to relative and police station.
7. STOP

## 6. FLOWCHART



number of casualties. . To use this method, the GSM system can be used, it will also help the police to identify drunk drivers and punish them by tracking his car using the GPS system.

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## 7. CONCLUSION

The proposed system will detect alcohol from the driver's breath and stop the car by cutting off the ignition instead of stopping the car directly. The system can notify the relatives of the driver, the police station. The future of this system is that it can also be checked when an incident occurs, will immediately notify the code specified in the application by the end user, and therefore the people in the car can get help as soon as possible by reducing the