1. **INTRODUCTION**

According to WHO approximately 1.3 million people die every year in road traffic accidents there are many factors pf these types of accidents i.e., high speed driving influence of alcohol and drugs calling while during invisibility due to fog, etc. in the world. By the Times of India article “north India has the greatest number of accident cases due to fog especially in four months, November December January February the death rate is also in these accidents as the accident that happened in the fog can be dangerous.

In India, the Ministry of Road Transport and Highways state that 12678 people died in 2018 due to fog-related accident in India. in 2017 this figure is near about 11090, and in 2016 it is 9317. So these type of accident types is increasing day by day in India as well as all over the world. In addition, a proposed system which is very much helpful to avoid this type of accident especially in foggy weather drink and drive cases, etc.

To avoid the accident due to bad weather drinking we are going to implement a system called **“Digital Vehicle Monitoring Systems”** in this proposed system an IOT based architecture is used. Apart from this, our system will also detect the driver’s alcohol level as well as pulse rate body temperature to monitor the health of the driver remotely, in addition, the location of the vehicle will also be captured by the GPS, GSM modules and to send the data to web servers to see the actual location of the vehicle and further future analysis.

**IoT (Internet of Things)**

IoT represents the physical objects and machines that can communicate with each other with the help of networks. Networks can be LAN (Local Area Network), WAN (Wide Area Network), Wi-Fi, Bluetooth. In this, we used some type of embedded system sensors, Micro-Controllers, Actuators. If we talk about the physical objects so that every physical thing (i.e., Ceiling Fan, AC, Refrigerators as well as Doors, Windows, Table, etc.) go under this category. As we all know that everything has its advantages as well as its drawbacks.

IoT is very useful in our day-to-day life. It can make human life easier and do the boring task automatically and very efficiently for example sometimes a person forgot to lock the door of their house and now he is in their or other work but know he needs to lock that door. So, by using IoT architecture and a particular setup he can easily lock their door from anywhere and at any time. But on the other hand, the implementation of these types of IoT setups has major challenges like Data encryption, Big Data analysis, Data Security (Avoid Cyber-Threats), etc. The sensors and as well as actuators generate a large amount of Data. Handling and storing these types of Data are major challenges. For security purposes, one can use Blockchain technology for Data encryption which is generated by the sensors and other types of microcontroller devices. Sensors are the very basic block of IoT it is not wrong if we state that the sensors are the backbone of this technology. Actuators are electro-mechanical devices that are used to convert electrical signals to mechanical movements. It acts like a human hand for the IoT systems to perform actions after receiving the electric signals.

**HARDWARE PARTS**

Toimplement this system, we are using the Arduino-Microcontroller, MQ-3 Alcohol Gas sensor, Pulse sensor, LM-35 Temperature sensor, Ublox Neo-6m GPS module, Sim800L GSM module, Laser Beam, Node MCU ESP8266 Wi-Fi Module.

**Arduino-Microcontroller Board**

It is the CPU of the system. It is based on Atmel 8-bit. AVR-Microcontroller. We will use the Arduino UNO board in this system is based on Atmega328. A UNO is a programmable micro-controller that can be connected to digital as well as analog signals which are generated by sensors, actuators.

It has a total of 14 digital input & output pins together with PWM (Pulse Width Modulation) output pins, a 16MHz crystal ceramic resonator, a USB connection port, a power connector jack, reset button. It is very simple to connect Arduino UNO with a computer by USB Arduino connector.

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*Fig.- Arduino UNO Micro-Controller*

**Hardware Architecture (Arduino UNO)**

* Operating & Input Voltage 5V, 7-12V
* Min. & Max. Limits of Input Voltage 6-12V
* Digital Pins 14
* PWM (~) Pins 6
* Analog Signal Input Pins 6
* Flash Memory 32KB
* Micro-Controller Chip Atmega328
* Clock speed 16MHz

**Alcohol Sensor MQ-3**

It is a sensor that can easily detect various gases especially Alcohol, Benzene, Methane, etc. The main sensitive material of the MQ-3 sensor is SNO2. SNO2 is less conductive in clean air and high conductive in gaseous atmospheres like Alcohol, Benzene, Methane, etc. It works on analog resistive output based on alcohol concentration.

It has four pins, namely,

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Fig.- MQ-3 gas sensor

1. **Vcc**

This pin is the power source for the sensor. Usually, the power supply for the sensor is +5V.

1. **Ground (GND)**

This pin is connected to the ground terminal of the battery directly.

1. **Digital Output**

It is used to get the digital signal from the sensors to the microcontroller board.

1. **Analog Output**

This pin is used to get the data from the sensor in the form of analog signals based on the intensity of gas in the atmosphere. It works on 0-5V analog output.

**Specifications**

* Operating voltage 5V DC
* Operating current 140-160mA
* Detecting concentration for alcohol 0.05-10 mg/L
* Working Temperature -10 0 C – 52 0 C

This sensor is a semi-conductor with an easy SIP header interface. It is compatible with all types of microcontrollers and also has a low-power standby mode. The sensitivity of the alcohol gas sensor is quite good and give a fast response to the microcontroller in term of cost and reliability, It is again a good module with low cost and long life. It is a very simple circuit, So anyone can understand the working of the sensor easily.

**Pulse Sensor (SEN-11574)**

**Pulse** is used to detect the heart rate of the human body. It gives us the live data of heart rate When a person touches it by their finger, the sensor detects heart rate and sends the signals to the microcontroller. It is also compatible with all types of microcontrollers it has three pins i.e., Operating voltage pin, Ground pin & Signal pin. The sensor works +3 to 5V DC voltage supply the sensor gives the data to Arduino in analog form.

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Fig.- Pulse Sensor (SEN11574)