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.

1. **LITERATURE REVIEW**

**2.1 GPS System**

By using the IoT (Internet of Things), GPS (Global Positioning System), Arduino UNO they have made a system in which we can check the real-time location of buses. To view the broadcast of the location they have used ManyCam, Google+ Hangouts, and YouTube as well as Facebook. There was a problem for students who lives inside or outside of college for checking bus locations. To solve this issue, their system has provided some benefits/advantages for students. Students will be able to check the exact location on some broadcast systems of buses to save their time.[1]

A GPS-based tracking system was designed by S. Madhuri & their team from VBIT (Vignana Bharathi Institute of Technology) [2], in which the location of the vehicle can be checked by using Arduino, MATLAB, Google Maps API. In this, they focused on the facilities manager in order to monitor the route of vehicles being used for transport. They will be able to see the traversed path of any vehicle. By using this, the military will be able to check which vehicle is used for the mission to track.

A Location finder system was developed by Preety Singh from Government Engineering College by using GPS technology, Neo 6m GPS module, and NodeMCU. In this, people can track the location of their vehicle. There was a problem for people who park their vehicle & unable to find it. They focused on this problem to make a system in which people can track the location.[3]

A team from Maharshi Dayanand University [4] have made an IOT based application in which they have tried to solve the problem of lost/stolen vehicle or bag. In this, they have used Google Map, Web Portal, Microsoft Azure/AWS which will show the real-time location of the vehicle on their android phones. In the future, they are trying to make an accelerometer that will be added to the tracking system in Airline Travel Sector.

**2.2 Driver’s Health Monitoring**

Other than the vehicle monitoring system, the monitoring of driver’s activity is also important. To do this, there are several ways to check the health and other activity of the driver, are available but one of the main, efficient, easy to use as well as popular ways are IoT based health monitoring system [5 Murli Subramaniyam]. There are some major issues with the drivers which can be very dangerous while they are driving a vehicle like; consumption of alcohol, sleeping problems, distractions, and other health-related issues.

The automobile industries are continuously trying to implement such systems to make their vehicles better and more securable. But something is missing yet. In the IoT-based driver health monitoring system, you need to get data about heart rate, body temperature, and the alcohol level of the driver. The MEMS (micro-electromechanical systems) technology and wireless sensor technologies are giving major support in the field of IoT-based monitoring systems. It is assumed that 50 billion IoT systems are going to be implemented by 2020[6 Pawan singh]. For driver monitoring systems, there are lots of medical sensors available in the market to implement and collect the data related to the human body like; Blood pressure, Body temperature, and breathing, etc [6]. Majorly medical sensors are wearable but, in some cases, we can use these sensors by connecting them directly to the microcontroller boards and another type of computational devices.

As we all know that if something has advantages then there are some disadvantages also associated with that. In this health monitoring prototype, data security is one of the major challenges [6], to fix this vulnerability one other system is proposed with the use of blockchain technology in IoT. By using blockchain technology we can secure the sensors generated data [7 ana reyna].

**2.3 Alcohol Detection**

Consumption of alcohol while driving is one of the main reasons for accidents all over the world. It is not only dangerous for the driver but passengers too. As we already showed the figures related to the accidents due to the alcohol consumption in India as well as all over the world, we need to implement a solid system which gives the alert when any driver of any school, college, or any other type of organizational as well as personal vehicle consume alcohol. To avoid these types of accidents, we need to implement an IoT-based health monitoring system (as described earlier) with an alcohol detector. M.H Mohammad and their team [8] are proposed a solution for this. They give us an alcohol detector system that is completely based on IoT. In this, they have used the MQ-3 alcohol gas sensor [7] to detect the concentration of alcoholic elements near the steering.

Gabriel Gasparesc [8] also proposed an IoT-based solution to avoid the consumption of alcohol at the time of driving. In this, he used the microcontroller boards, alcohol sensor, LCD display to display something. According to this system, if the driver drinks and tries to drive the vehicle then the ignition system is turned off automatically [8]. This is system is much better but what about the organization inquiry? For this, we should need to establish a control panel, at which the real-time information of the driver’s body is displayed.

**2.4 Pulse & Temperature Detection**

Mahima Chawla [9] used the LM-35 temperature sensor and the pulse sensor to monitor the heart rate by connecting it to the Arduino microcontroller. In this article, she got the heart rate rating in BPM [beat per minute]. From the driver’s monitoring point of view, this is also very helpful because as we discussed earlier that we need to get the alcohol consumption-related data onto an admin panel, so the temperature-related and pulse-related data can be delivered to the same admin panel. By doing this we can get more data about the driver’s physical body information.

According to Yuda Irawan [10], a medical check-up is important in our day-to-day life. Firstly, the doctors check the heart rate in kind of medical disease because it is important to know about our heart that it is working will satisfying condition or not. Irawan [10] showed an experimental setup in their paper to measure the heart rate by using just an Arduino microcontroller board and a pulse sensor. His team is successfully able to receive the data on the android platform.

**2.5 Laser Projection System**

After core laser light show projectors take one or more laser diode to send that beam to some optical path to create a field in the air or on the wall at their core laser light show projector take one or more laser diodes and send that beam through some optical path to create a beam in the air or on the wall. You can even make your own laser projector based on the same principles using a few moving mirrors. These mirrors are mounted on tiny high-speed precision motors called galvanometers; these galvanometers move this single beam through space quickly enough that to the eye. Their main function is to interpret the from your lighting console or computer into something the laser diodes and scanners can use to create patterns in this next section.

As a laser diode module, this projector is the most common configuration of red, green, and blue. While others reflect allowing us to combine multiple laser diodes into a single beam path this single beam path then goes to set of what most people need a street call Calvo’s, or a Galvo set Gallo’s are a set of galvanometer motors and a block with high-efficiency mirrors mounted on their shafts in this configuration the laser beam hits the lower mirror first which then control the X-axis movement of the output. If we had a sine wave to the Y-axis, then this is times sine wave on the X-axis, but it had 90 degrees offset. Which is making across the circle the circles being drawn in an array of once per second or 1Hertz. The exact same principles applied column regulation the most commonly used control signal for laser diode drivers is zero to 5 volts per color for zero to 100% power for each color. If we then drop the green voltage to zero. The laser goes through the middle of the X-axis and prints.

1. **PROBLEM STATEMENT**

As we know that 1.3 million people die each year in the world as a result of road traffic accidents. This figure is very large in terms of death. In the given figure, many of them are the only person who was earning in their family and due to this not only one person die but also their family will not be able to survive. In India, 1,33,201 people died due to road accidents during 2020. More than 3.54 lakh road accidents happened in India and approx. 60% of cases were due to overspeeding. If we talk about the percentage of death rate in India from the given of 1.3 million by W.H.O is 10% of 1.3 million. According to National Crime Record Bureau (NCRB), the drink & drive road accidents that occurred in 2019 were 12,256 and this figure is the registered cases & the unregistered cases can be a huge figure. Around 2% of overall road accidents are due to drinking and drive. According to the Times of India’s article, “Approx. 10,007 road accidents occurred due to fog out of which 7205 people lost their lives in 2019”.

Many of the injured people due to the road accidents also lose their life as if accidents happened, there were not many people to help them and also, we can’t track their location to send them to the medical facility. Many of the people’s lives can be saved if we know their exact location. Due to these accidents only not, the driver lost their life but also many innocent people die. If we talk about the buses a mistake by a driver can risk all the life of passengers. A small mistake can risk the lives of innocent people. If we analyze the factor of accidents, then the major factor is overspeeding drink and drive and weather conditions. To reduce these accidents, we are establishing a system in which the figure of road accidents due to over speeding drink and drive foggy weather and the bad health of drivers can be reduced and also to get the exact location of accidents that happened so that we can send them medical facilities instantly.

1. **FUTURE OUTCOME**

As we all know, road traffic accidents are increasing day by day. 1.3 million people die each year in the world as a result of road traffic accidents. In India, 1,33,201 people died due to road accidents during 2020. More than 3.54 lakh road accidents happened in India and approx. 60% of cases were due to overspeeding. If we talk about the percentage of death rate in India from the given of 1.3 million by W.H.O is 10% of 1.3 million. Many people’s lives can be saved by knowing their accidental location. [Problem Statement] If we analyze the factor of accidents, then the major factor is overspeeding drink and drive and weather conditions. To reduce these accidents, we are establishing a system in which the figure of road accidents due to over speeding drink and drive foggy weather and the bad health of drivers can be reduced and also to get the exact location of accidents that happened so that we can send them medical facilities instantly. [Problem Statement] We have to make a system in which we can control the number of accidents occurring day by day.

By using the Arduino UNO Microcontroller, Ublox Neo 6m GPS Module, SIM800L GSM Module, ESP8366 Wi-Fi Module, Pulse Sensor, LM-35 Temperature Sensor, MQ-3 Sensor, Web Server, Google Map API, and Laser, we can develop an IoT based Architecture in which we can monitor the alcohol level, pulse level, temperature of driver and exact location of the vehicle also we can reduce the accidental risks due to bad health of driver or alcohol consumption of driver.

We can decrease the road accidents of vehicles in foggy weather by making a Laser-Based System. By monitoring the health of the driver, we can reduce the number of accidents that happen in today’s world. Also, we can save the lives of innocent people who die in accidents and save their life by tracking the location of the vehicle where the accident happened to send them medical facility instantly.