IOT BASED GPS TRACKING SYSTEM WITH BLACK BOX

A PROJECT REPORT

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INTERNAL EXAMINER **EXTERNAL EXAMINER**

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ABSTRACT

The IoT based GPS Tracking System project aims to develop a system that can track the location of a device in real-time using GPS technology. The system will use an IoT-based architecture that includes a GPS module, a microcontroller, and a communication module to enable real-time tracking of the device. The device will be equipped with a GPS module that will send its location data to the microcontroller, which will then process and transmit the information to the server via the communication module. The system will also have a web-based user interface that allows users to track the device's location on a map and receive real-time updates. Once an accident is detected, the system sends an alert to a pre-defined emergency contact number with the location of the accident. If the accident is not severe then the owner of the vehicle can press panic switch in order to cancel the alert message. It is used to mainly focus on developing a system that can record important data during accidents or critical events in a vehicle. In the event of an accident or other critical event, the data can be retrieved and analyzed to determine the cause of the event. It provides valuable information for accident investigation and can help improve vehicle safety by identifying areas for improvement.

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LIST OF ABBREVIATIONS

ABBREVIATIONS	EXPLANATION
IOT	INTERNET OF THINGS
GNSS	GLOBAL NAVIGATION SATELLITE SYSTEM
ILS	ITERATIVE LEAST SQUARE
CV	CONSTANT VELOCITY
NN	NEAREST NEIGHBOR
PDA	PROBABILISTIC DATA ASSOCIATION
PPP	PRECISE POINT POSITIONING
GSM	GLOBAL SYSTEM FOR MOBILE COMMUNICATION
SSDLC	SYNTHESIZED SAFETY DISTANCE FOR LANE CHANGING
JMPC	JOINT MODEL PREDICTIVE CONTROL
AGV	AUTONOMOUS GROUND VEHICLE

CHAPTER 1
INTRODUCTION

In the present day everyone is running behind speed all want to come first. In such sceneries accident are increasing. Daily many new vehicles are being added on the road. This also increases the amount of accident. Many are being enforced to reduce accidents but none of them have been able to stop them, but they are only able to decrease them to an extent. The highway safety association in Europe and America has been planning to implement some devices into vehicles which would safely guard the interest of the passengers. The motor giant General Motors have initiated many research and developmental activities in this regard. The vehicles are fitted with airbags, anti-lock braking system and many such things. But in order to do any research or development there is a need for the knowledge of the real cause of the accident. The accident may occur due to the mistake of others or the problems in the working of the vehicle such as break failure or fire accident. The presently available features which are incorporated into vehicles are GPS, tracking and mapping. The European Union and America are planning to incorporate certain data loggers into vehicles which would record the vehicle parameters. The IEEE has also introduced some standards in this regard. The system proposed to be like a black box which logs implementation inside the vehicles and the performance of the vehicles. The proposal of the IEEE association is audio and video logging and engine parameters such as the temperature brake conditions, sharp turn, torque of the vehicle etc. this is analogous to a black box billion-dollar aircraft industry is affordable such costly devices cannot be incorporated into a car as such systems will cost more than the car itself. Moreover, there is no alert system. So, we made an initiative to design a data logger as an emergency alert system.

This initiative was made because of delayed medical help and relief. We also kept in mind as to decrease the cost so as to make it affordable to vehicle of all ranges. Our data logger logs the conversation and voice inside the cabin and also the location. The accident is sensed for the fire accidents and physical collision and when such an accident occurs an alert message is sent to pre-stored mobile number. Our system can be also further expanded by adding up many more sensors such as vibration sensors, gas sensors. This can also be incorporated with GPS mapping to find out the way. There is a video recording option but since it costly it can only be incorporated in to high end cars. is a crucial initiative aimed at improving emergency response time and reducing fatalities resulting from accidents. The proposed system is designed to use sensors to detect sudden changes in vehicle movement and communicate the information to a central server for analysis. The system can be integrated with GPS to provide accurate location data and can send alerts to a pre-defined emergency contact number in the event of an accident. The project aims to develop a system that can significantly reduce the response time to accidents and provide real-time location data to emergency responders. The Black System project aims the paramount importance as it can save precious lives by enabling prompt emergency response to accidents. The system can also provide valuable information for accident investigation and help identify areas for improvement in vehicle design and operation. The project aims to integrate cutting-edge sensor and communication technologies to develop an efficient and reliable Accident Alert System that can revolutionize the automotive industry

1.1 IOT (INTERNET OF THINGS)

The Internet of Things (IoT) is a network of physical devices, vehicles, buildings, and other objects that are embedded with sensors, software, and connectivity, allowing them to collect and exchange data. This data can be used to improve efficiency, safety, and convenience in a wide range of applications such as smart homes, healthcare, transportation, and industrial automation. IoT devices can range from small consumer devices such as smart thermostats and wearables to large industrial equipment such as oil rigs and turbines. These devices are often connected to a cloud-based platform where data can be processed, analyzed, and used to inform decision-making. The benefits of IoT include improved efficiency and productivity, cost savings, enhanced customer experiences, and increased safety and security. For example, a smart home system can adjust heating and cooling based on occupancy, while a smart city can optimize traffic flow to reduce congestion. However, the growth of IoT also brings challenges such as security risks, data privacy concerns, and the need for standardized protocols to enable interoperability between devices. As the technology continues to develop, it will be important to address these challenges while maximizing the benefits of IoT. The applications of IoT are broad and varied, ranging from smart homes and cities to industrial automation and healthcare. IoT has the potential to transform entire industries, making them more efficient and cost-effective, while also improving safety and quality of life for individuals.

CHAPTER 2

LITERATURE SURVEY

2.1 Title: Navigation in GPS Spoofed Environment Using M-Best Positioning Algorithm and Data Association

Author: Bethi Pardhasaradhi, Pathipati Srihari, and P. Aparna (February 2021)

Description:

Intentionally misguiding a global positioning system (GPS) receiver has become a potential threat to almost all civilian GPS receivers in recent years. GPS spoofing is among the types of intentional interference, in which a spoofing device transmits spoofed signals towards the GPS receiver to alter the GPS positioning information. This paper presents a robust positioning algorithm, followed by a track filter, to mitigate the effects of spoofing. It is proposed to accept the authentic GPS signals and spoofed GPS signals into the positioning algorithm and perform the robust positioning with all possible combinations of authentic and spoofed pseudo range measurements. The pseudo range positioning algorithm is accomplished using an iterative least square (ILS). Further, to efficiently represent the robust algorithm, the M-best position algorithm is proposed, in which a likelihood-based cost function optimizes the positions and only provides M-best positions at a given epoch. However, during robust positioning, the positions evolved due to spoofed pseudo range measurements are removed to overcome GPS spoofing. In order to remove the fake positions being evolved owing to wrong measurement associations in the ILS, a gating technique is applied within the Kalman filter (KF) framework. The navigation filter is a three-dimensional KF with a constant velocity (CV) model, all the position estimates evolved at a specific epoch are observations. Besides, to enhance this technique's performance, the track to position association is performed by using two data association algorithms: nearest neighbor (NN) and probabilistic data association (PDA).

2.2 Title: Real-time GNSS precise point positioning with smartphones for vehicle navigation

Author: Zishen Li1, Liang Wang, Ningbo Wang, and Ang Liu (March 2021)

Description:

The availability of raw Global Navigation Satellite System (GNSS) measurements from Android smart devices gives new possibilities for precise positioning solutions, e.g., Precise Point Positioning (PPP). However, the accuracy of the PPP with smart devices currently is a few meters due to the poor quality of the raw GNSS measurements in a kinematic scenario and in urban environments, particularly when the smart devices are placed inside vehicles. To promote the application of GNSS PPP for land vehicle navigation with smart devices, this contribution studies the real-time PPP with smartphones. For data quality analysis and positioning performance validation, two vehicle-based kinematic positioning tests were carried out using two Huawei Mate30 smartphones and two Huawei P40 smartphones with diferent installation modes: the vehicle-roof mode with smartphones mounted on the top roof outside the vehicle, and the dashboard mode with smartphones stabilized on the dashboard inside the vehicle. To realize high accuracy positioning, we proposed a real-time smartphone PPP method with the data processing strategies adapted for smart devices. Positioning results show that the real-time PPP can achieve the horizontal positioning accuracy of about 1–1.5 m in terms of root-mean-square and better than 2.5 m at the 95th percentile for the vehicle-based kinematic positioning with the experimental smartphones mounted on the dashboard inside the vehicle, which is the real scenario in vehicle navigation.

2.3 Title: GPS Based Vehicle Tracking System

Author: Mohd Hakimi Bin Zohari, Mohd Fiqri Bin Mohd Nazri (April 2021)

Description:

The research is about creating a system for tracking vehicle. Objective of the research is to design and develop a GPS based Vehicle Tracking System in order to display location of vehicle on Google Maps. This system used Arduino MEGA as a microcontroller and it will be used as the main processing unit. Next, Ublox NEO-6m GPS module is used to routing the coordinate while SIM 900A GSM module is used to connecting with the user. The product was successfully run at outdoor and having some problem at indoor due to GPS module cannot extract the accurate coordinate when there is a roof or obstructer that block the direct signal connection between the GPS and satellite. For the next improvement, the researcher can use the high quality of GPS module to connect with satellite. An example, GPS NEO-6P module where it can collect data more accurate and stay connect to the satellite. Nowadays, crime rates in Malaysia are increasing rapidly, such as stolen vehicles cases. Various devices have been invented to reduce the crime rate. This is because criminals are also become crafty and they using various ways to commit crimes. Now the demand for the vehicle's detection devices increases from time to time, it is increasing in line with the growing number of vehicles in Malaysia. Lot of tracking devices have been installed in vehicles, either by the car manufacturer or by third party developer. Today's electronic technology is growing fast, making users more tend to using tools that can be controlled directly through their phones or computer.

2.4 Title: Accident Detection and Alert System

Author: Dr. C. K. Gomathy, K Rohan, Bandi Mani Kiran Reddy, Dr. V Geetha (May 2022)

Description:

Road accidents rates are very high nowadays, especially two wheelers. Timely medical aid can help in saving lives. This system aims to alert the nearby medical center about the accident to provide immediate medical aid. The attached accelerometer in the vehicle senses the tilt of the vehicle and a heartbeat sensor on the user's body senses the abnormality of the heartbeat to understand the seriousness of the accident. Thus, the systems will make the decision and sends the information to the smartphone, connected to the accelerometer through GSM and GPS modules. The Android application in the mobile phone will send text messages to the nearest medical center and friends. Application also shares the exact location of the accident and it can save time. Nowadays, the rate of accidents has increased rapidly. Due to employment, the usage of vehicles like cars, bikes have increased, because of this reason the accidents can happen due to over speed. People are going under risk because of their over speed, due to unavailability of advanced techniques, the rate of accidents can't be decreased. To reduce the accident rate in the country this paper introduces a solution. Automatic accident detection and alert systems are introduced. The main objective is to control the accidents by sending a message to the registered mobile, hospital and police station using wireless communications techniques. When an accident occurs in a city or any place, the message is sent to the registered mobile through GSM module in less time

2.5 Title: A lane changing time point and path tracking framework for autonomous ground vehicle

Author: Jiayu Fan Jun Liang Anjan K. Tula (March 2022)

Description:

Performing stable and safe lane changes can avoid collisions and improve traffic safety. In recent years, most of the research in automated ground transportation was focused on path planning and path tracking. However, this work emphasizes the importance of lane changing time point. Based on traditional safety distance, a novel concept, that is the synthesized safety distance for lane changing (SSDLC), is proposed to study lane changing time point. It consists of the reference safety distance and lane changing safety distance, and the weight coefficient between them is obtained by fuzzy logic control algorithm. Additionally, the joint model predictive control (JMPC) is proposed to follow the reference trajectory. This newly established algorithm not only considers the physical saturation of actuators but the yaw stability characteristics. To overcome the calculation difficulty to obtain the optimal results in the prescribed time, the algorithm adds a relaxation factor in the objective function. Finally, the lane changing time point and path tracking framework is modeled and simulated on a CarSim-Simulink platform. Four scenarios are carried out to illustrate the feasibility of the proposed framework. In recent years, the traffic accidents resulting from people frequently happen. In order to reduce these accidents and improve car driving safety, autonomous ground vehicle (AGV) is brought to the forefront. Every AGV is equipped with many active safety systems which can ensure vehicle safety and stability. Among these, the active vehicle collision avoidance system is one crucial portion, which conducts lane changing behavior.

CHAPTER 3

SYSTEM ANALYSIS

3.1 EXISITING SYSTEM

The extent of work that has been done so far in existing system involves creating the “Blackbox” module and doing several test runs on different streets inside the city to collect data for varying road conditions. The collected data provides a rough idea of the varying road conditions of different parts of the city. For example, usage of appropriate machine learning algorithms to train the collected data will go a long way for the research to reach its ultimate aim. Different appropriately chosen data science techniques must be implemented to come up with conclusive measures. Moreover, several test runs for more varying road conditions are to be carried out and a fully accessible database with an alert system is to be developed with the intent of aiding drivers around the country in the form of alerting them about hazardous road conditions. At its current stage the module can successfully detect accidents and send alerts to first responders in the fastest possible time. Moreover, while in operation, it can also read and record several vital parameters of the condition of a road.

3.1.1 Disadvantages of Existing System

- Cannot cancel the alert message if crash is not severe.
- Short range of communication.
- Crash details cannot be recorded.
- Implementation cost is high.

3.2 PROPOSED SYSTEM

The proposed Black Box System is a comprehensive system that uses advanced sensor and communication technologies to provide real-time alerts in the event of an accident. The system includes sensors that detect sudden changes in vehicle movement and send the data to a central server for analysis. The system can be integrated with GPS to provide accurate location data, and the communication module can send alerts to a pre-defined emergency contact number in the event of an accident. Multiple sensors are used in vehicle to detect and inform through IOT and GPS in black box module. Panic switch is used to control the sending information. The information will be sent to nearby police station or hospital or home. Event of crash is stored in webpage and server.

3.2.1 Advantages of Proposed System

- The vehicle safety authorities can enhance the crash reports for post- crash analysis of the event.
- Multiple sensors are used for multiple purposes with help of GPS and IOT Module.
- Implementation cost is low.

CHAPTER 4

SYSTEM REQUIREMENTS

4.1 HARDWARE REQUIREMENTS

- CPU type : Intel Pentium 4
- Clock speed : 3.0 GHz
- Ram size : 512 MB
- Hard disk capacity : 40 GB
- Monitor type : 15 Inch color monitor
- Keyboard type : Internet keyboard

4.2 SOFTWARE REQUIREMENTS

- Operating System : Windows OS
- Language : PHP, Embedded

CHAPTER 5

SYSTEM DESIGN

5.1 SYSTEM ARCHITECTURE

A system architecture or systems architecture is the conceptual model that defines the structure, behavior, and more views of a system. An architecture description is a formal description and representation of a system, organized in a way that supports reasoning about the structures and behaviors of the system. System architecture can comprise system components, the externally visible properties of those components, the relationships (e.g: the behavior) between them.

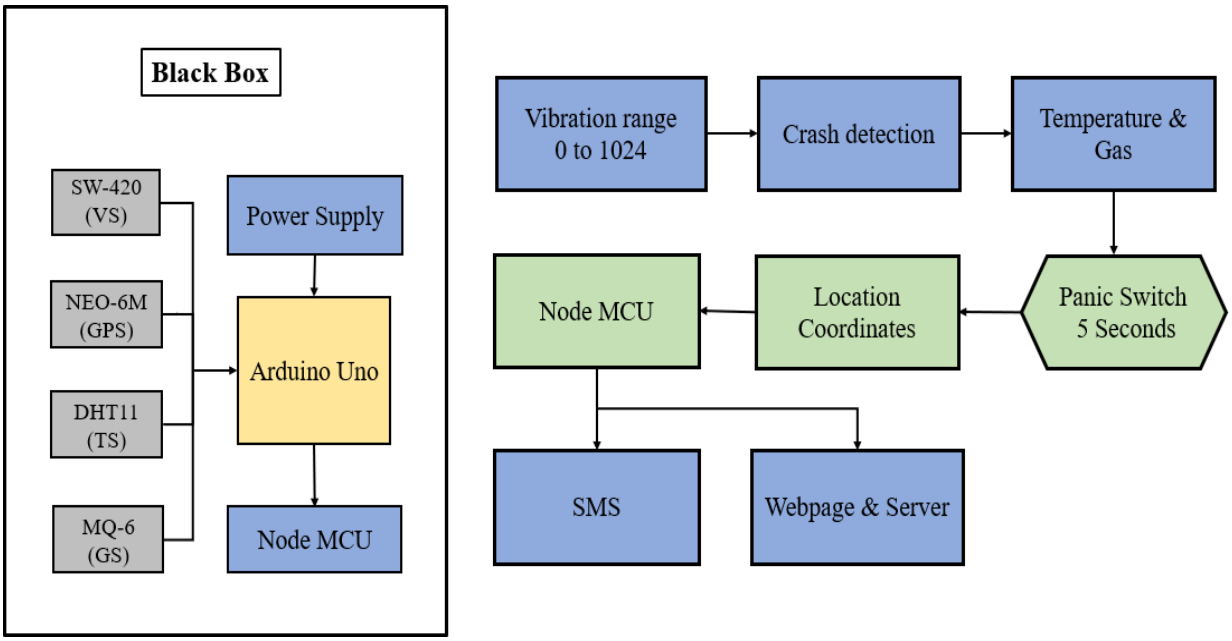

Figure No: 5.1.1 System Architecture

5.2 BLOCK DIAGRAM

A block diagram typically represents the architecture of a system or device, showing the various components and their connections. The blocks in a hardware block diagram can represent physical components such as processors, memory chips, input/output interfaces, power supplies, sensors, and actuators.

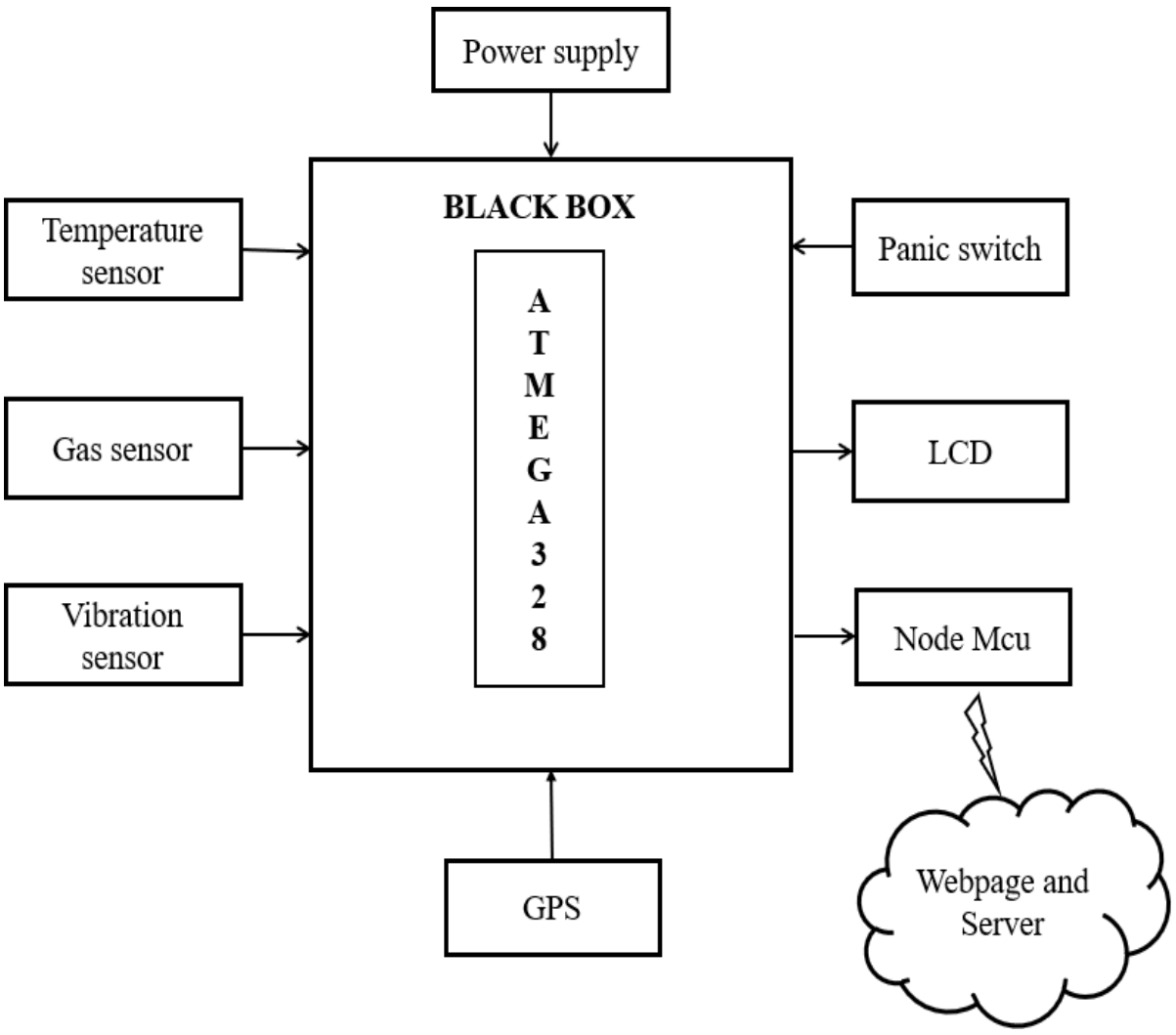

Figure No: 5.2.1 Block Diagram

5.3 CIRCUIT DIAGRAM

Use case diagrams are usually referred to as behavior diagrams used to describe a set of actions (use cases) that some system or systems (subject) should or can perform in collaboration with one or more external users of the system (actors).A use case diagram at its simplest is a representation of a user's interaction with the system that shows the relationship between the user and the different use cases in which the user is involved.

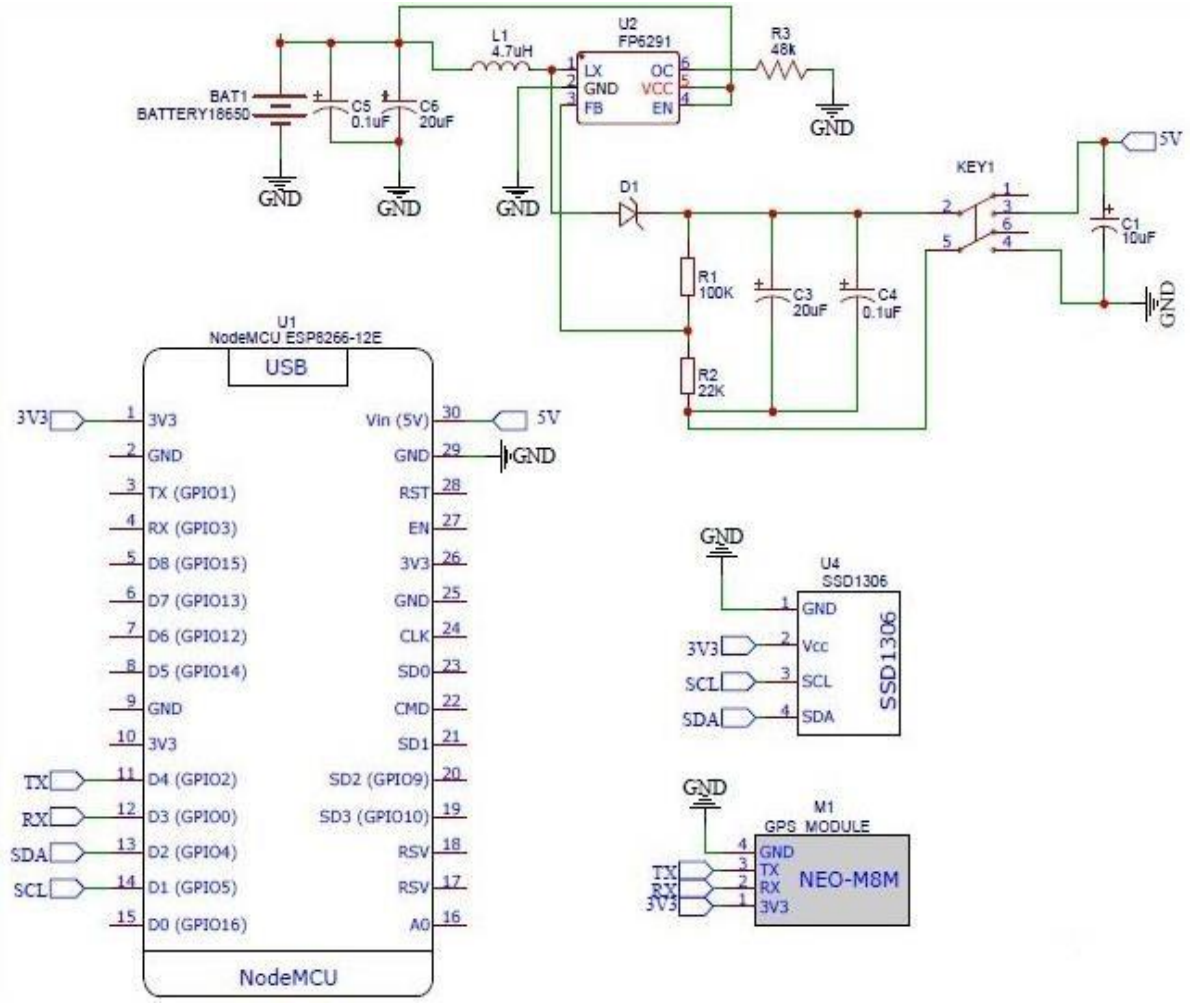

Figure No: 5.3 Circuit Diagram

5.3.1 ACTIVITY DIAGRAM

An activity diagram visually presents a series of actions or flow of control in a system similar to a flowchart or a data flow diagram. Activity diagrams are often used in business process modeling. They can also describe the steps in a use case diagram. Activities modeled can be sequential and concurrent.

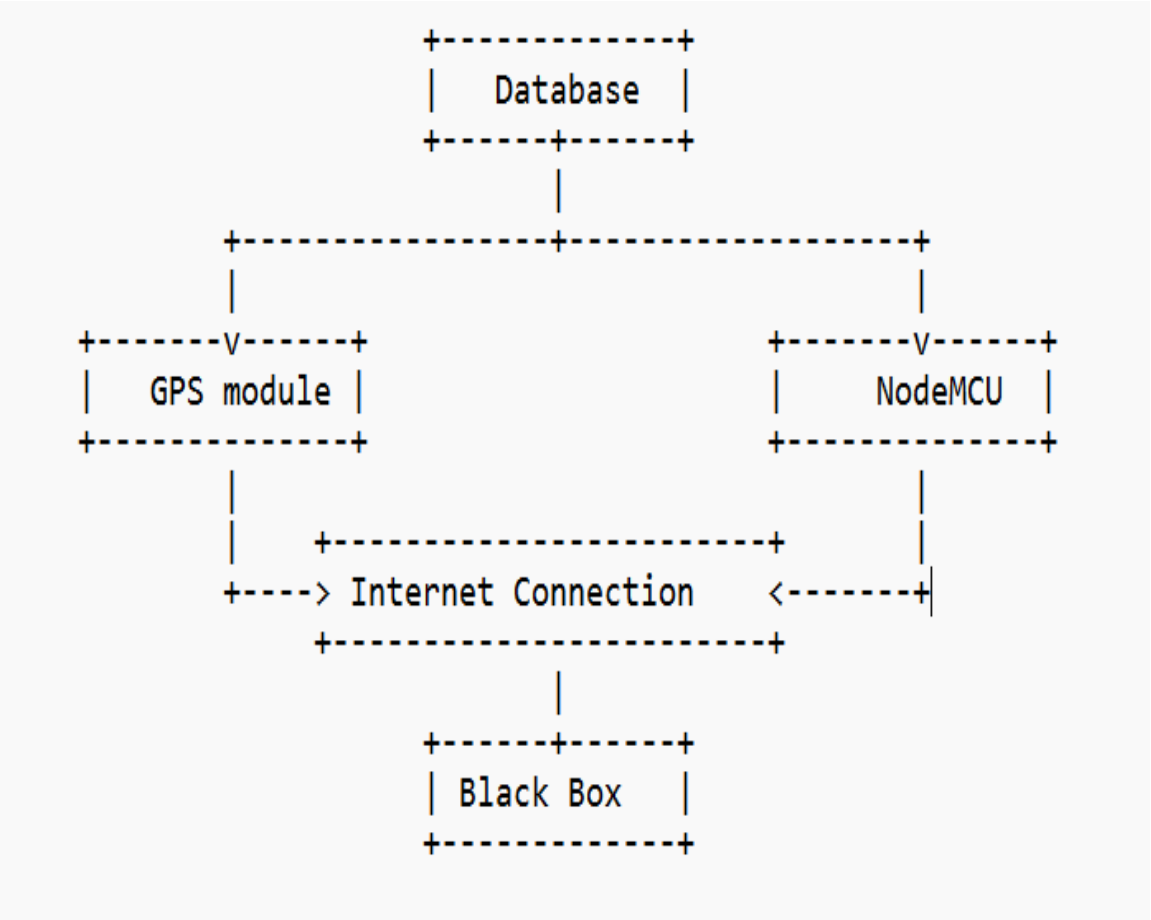

Figure No: 5.3.1 Activity Diagram

5.3.2 SEQUENCE DIAGRAM

The sequence diagram is a good diagram to use to document a system's requirements and to flush out a system's design. The reason the sequence diagram is so useful is because it shows the interaction logic between the objects in the system in the time order that the interactions take place. A sequence diagram shows object interactions arranged in time sequence.

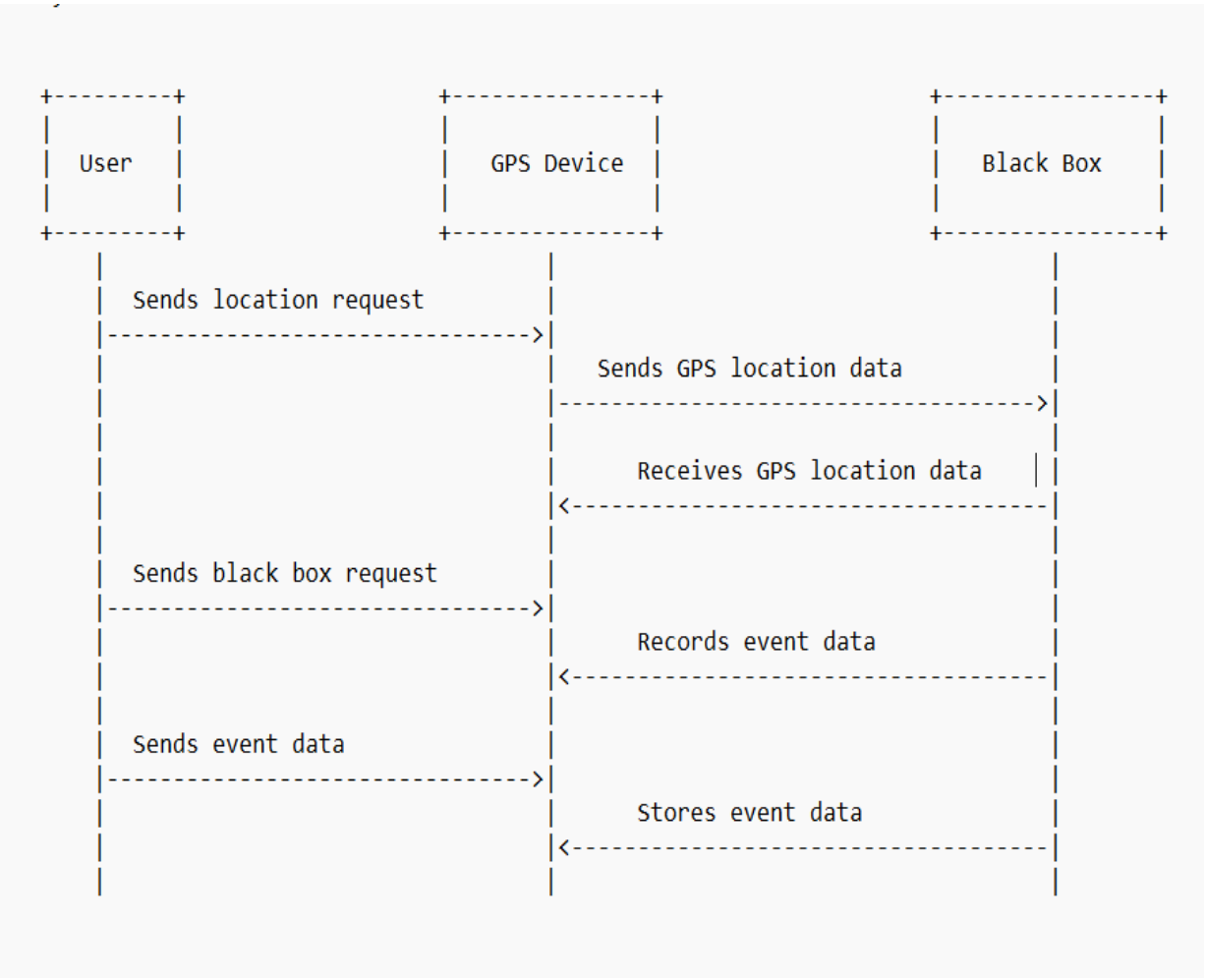

Fig: 5.3.3 Sequence Diagram

CHAPTER 6

MODULE DESCRPTION

6.1 List of Modules

- Vibration detection
- Data acquisition
- GPS module
- Message alert

6.1.1 Vibration Detection

Vibration detection using IoT (Internet of Things) involves the use of sensors to detect and measure vibrations in different types of equipment, such as machines, vehicles, and buildings. These sensors can be connected to the internet, allowing for remote monitoring and analysis of the collected data. The collected data can be analyzed using machine learning algorithms to identify patterns and anomalies in the vibration signatures. This information can be used to predict potential equipment failures and schedule preventive maintenance, reducing downtime and improving overall equipment efficiency.

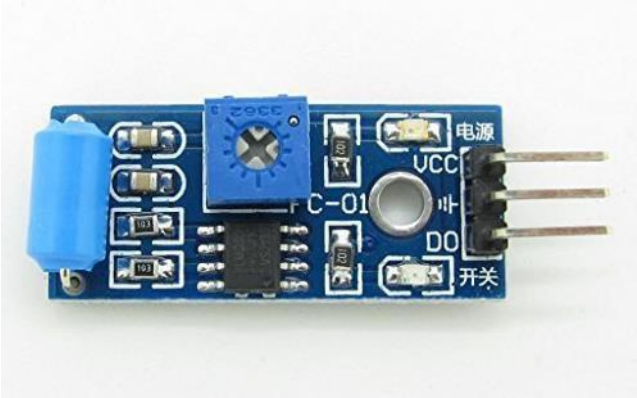

Figure 6.1.1 SW-420 (Vibration Sensor)

6.1.2 Data Acquisition

Data acquisition in IoT (Internet of Things) refers to the process of collecting data from various connected devices or sensors and storing it for analysis or further processing. In IoT, a large number of devices are connected to the internet and produce vast amounts of data, which can be used to gain insights and improve decision-making. It is an essential component of many applications, such as smart cities, industrial automation, and healthcare. It enables real-time monitoring and control of various systems, improves operational efficiency, and reduces costs. However, data security and privacy are also critical concerns in IoT data acquisition, as the data collected can contain sensitive information about individuals or organizations. Therefore, proper security measures must be implemented to protect the data and prevent unauthorized access.

Figure 6.1.2 MQ-6 (Gas sensor)

Figure 6.1.2.1 DHT11 (Temperature Sensor)

6.1.3 GPS Module

The NEO-6M is a small and affordable GPS module that is commonly used in various applications, such as drones, robotics, and vehicle tracking systems. It is designed to provide accurate and reliable GPS data with minimal power consumption. The NEO-6M module uses the Global Positioning System (GPS) to determine the location of the device it is attached to. It receives signals from multiple GPS satellites to calculate its position and provides this information to the device it is connected to in real-time. The module communicates with the host device through a serial interface and provides GPS data in the form of NMEA sentences. These sentences contain information such as latitude, longitude, altitude, speed, and heading, which can be used to track the position and movement of the device. The NEO-6M module is small in size and can be easily integrated into various electronic projects. It requires minimal power to operate and has a built-in backup battery that helps it retain its GPS data even when the power is turned off. Overall, the NEO-6M GPS module is a cost-effective and reliable solution for obtaining accurate GPS data. Its small size, low power consumption, and easy integration make it a popular choice for various GPS tracking applications

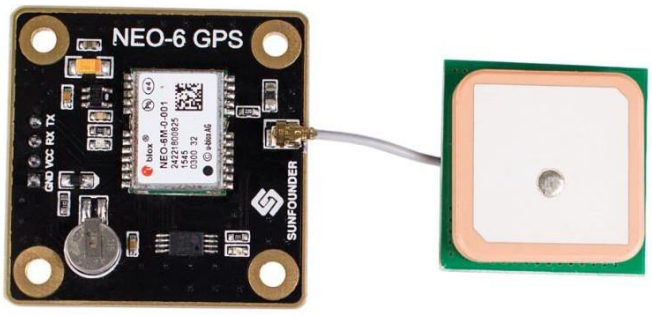

Figure 6.1.3 Neo-6m (GPS Sensor)

6.1.4 Message Alert

A message alert in IoT (Internet of Things) refers to a notification or alert that is triggered by a device or sensor connected to the internet. This notification is usually sent to a user's mobile device or computer, informing them of a certain event or change in status in their IoT system. Message alerts in IoT can be customized and configured to meet the specific needs of the user. They can be triggered by various events such as changes in temperature, By receiving these alerts, users can take prompt action to address any issues or concerns in their IoT system.

CHAPTER 7

HARDWARE

7.1 List of Hardware:

- Arduino Uno
- Node MCU
- LCD display
- Power Supply

7.1.1 Arduino Uno:

The Arduino Uno is a microcontroller board based on the ATmega328P microcontroller chip. It has 14 digital input/output pins (6 of which can be used as PWM outputs), 6 analog inputs, a 16 MHz quartz crystal, a USB connection, a power jack, an ICSP header, and a reset button. The board is designed to be easy to use and program, making it a popular choice for hobbyists and beginners. The digital pins on the Arduino Uno can be used for a variety of purposes, including controlling LEDs, motors, and other devices. The analog inputs can be used to read sensors and other analog signals. The board can be programmed using the Arduino software, which is based on a simple programming language that is easy to learn. The Arduino Uno board is compatible with a wide range of shields, which are boards that can be plugged onto the Arduino to add additional functionality. For example, there are shields available for controlling motors, connecting to wireless networks, and more. Overall, the Arduino Uno is a versatile and easy-to-use microcontroller board that is well-suited for a wide range of projects, from simple LED blinking to more complex robotics and automation applications.

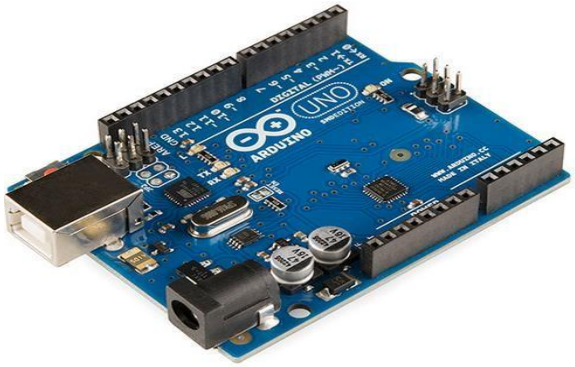

Figure 7.1.1 Arduino Uno

7.1.2 NodeMCU

NodeMCU is an open-source firmware and development board based on the ESP8266 microcontroller. It is designed to provide a platform for Internet of Things (IoT) projects and can be programmed using the Lua scripting language. The NodeMCU board has a built-in Wi-Fi module, which makes it easy to connect to the internet and communicate with other devices. It also has a USB interface for programming and power supply, and a number of GPIO pins that can be used for controlling external devices. The Lua programming language used by NodeMCU easy to learn and well-suited for IoT applications. It allows developers to quickly prototype and develop applications that can be deployed on the NodeMCU board. In addition to Lua, the NodeMCU board can also be programmed using the Arduino IDE, which makes it compatible with a wide range of libraries and tools. This makes it a versatile platform for IoT development, and has contributed to its popularity in the maker community. Overall, the NodeMCU board is a powerful and easy-to-use platform for developing IoT applications. Its built-in Wi-Fi module, GPIO pins, and support for the Lua programming language make it an attractive choice for developers looking to quickly prototype and develop IoT projects.

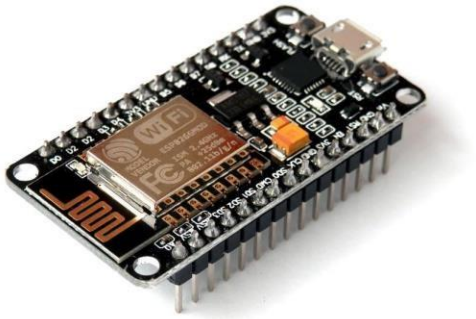

Figure 7.1.2 ESP8266 (NodeMCU)

7.1.3 LCD Display

LCD stands for Liquid Crystal Display. It is a type of flat-panel display that is commonly used in electronic devices such as televisions, computer monitors, and smartphones. LCDs work by using liquid crystals, which are a type of material that can change the polarization of light passing through them when an electric field is applied. The liquid crystals are sandwiched between two layers of glass, and the glass is coated with transparent electrodes that can apply the electric field. The system can be connected to the internet, allowing data to be transmitted to a central server for analysis and reporting.

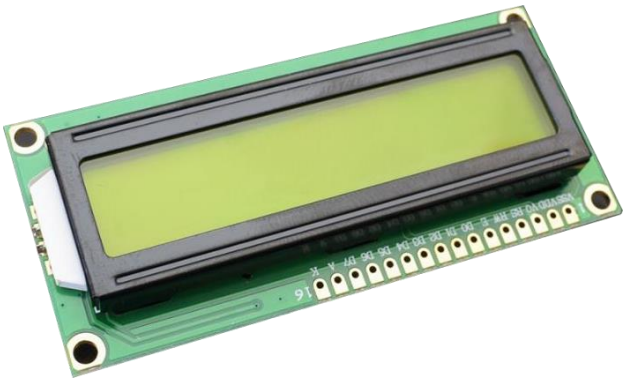

Figure 7.1.3 LCD Display

7.1.4 Power Supply

The power supply used in a black box or event data recorder (EDR) in vehicles typically comes from the vehicle's electrical system. In modern vehicles, the black box is usually connected to the car's battery and powered by the electrical system. The black box may also have its own backup power supply, such as a small battery or capacitor, to ensure that it can continue to record data in the event of a power loss or interruption. The black box continuously records data, including vehicle speed, acceleration, braking, and other important information, which can be used in accident investigations or to help manufacturers improve vehicle safety. It's worth noting that the black box is not something that can be easily accessed by the average person, as it's typically located in a secure location within the vehicle and requires specialized equipment to retrieve the data. The data stored in the black box is also subject to strict privacy regulations, and can only be accessed under specific circumstances, such as for accident investigation or legal proceedings.

CHAPTER 8

CONCLUSION AND FUTURE ENHANCEMENT

8.1 CONCLUSION

In conclusion, the Black Box system project is an important and innovative project that has the potential to save lives and reduce the severity of injuries in case of accidents. By using a combination of sensors, microcontrollers, and wireless communication technologies, the proposed system is able to detect accidents and send alerts to emergency services and designated contacts in real-time. The system is designed to be easy to install and use, and can be customized to meet the specific needs of different users. It is also cost-effective and reliable, making it a practical solution for improving road safety. Overall, the accident alert system project demonstrates the potential of technology to address important societal challenges and improve people's lives. By leveraging the power of IoT and other emerging technologies, we can create innovative solutions that have a positive impact on society.

8.2 FUTURE ENHANCEMENT

There are several potential future enhancements that could be made to the black box in vehicle project to improve its functionality and usefulness. Here are some ideas: Integration with telematics systems: The black box could be integrated with existing telematics systems to provide more comprehensive data on vehicle performance, fuel efficiency, and other factors. Real-time monitoring and feedback: The black box could be enhanced to provide real-time feedback to drivers on their driving behaviour, such as speeding, hard braking, and aggressive cornering. Advanced data analytics: The data collected by the black box could be analysed using advanced data analytics techniques to identify trends, patterns, and other insights that could be used to improve vehicle performance and safety. Integration with autonomous driving systems: The black box could be integrated with emerging autonomous driving systems, providing valuable data and insights that could be used to improve the safety and reliability of these systems. Advanced crash detection: The black box could be enhanced to include advanced crash detection technology, such as sensors and cameras, that could provide more detailed information on the cause and severity of accidents.

APPENDICES

A) SOURCE CODE

```
#include <ESP8266WiFi.h>
#include <WiFiClient.h>
#include <ESP8266WebServer.h>
#include <ESP8266HTTPClient.h>
const char *ssid = "SMART-G";
const char *password = "10112019";
const char *host = "https://myprojectfinal.in";


void setup() {
  delay(1000);
  Serial.begin(9600);
  WiFi.mode(WIFI_OFF);
  delay(1000);
  WiFi.mode(WIFI_STA);
  WiFi.begin(ssid, password);
  Serial.println("");
  Serial.print("Connecting");
  while (WiFi.status() != WL_CONNECTED)
  {
    delay(500);
    Serial.print("*");
  }
  Serial.println("");
  Serial.print("Connected to ");
  Serial.println(ssid);
  Serial.print("IP address: ");
  Serial.println(WiFi.localIP());
  delay(1000);


}
void loop()
{

 while(Serial.available())
{

//HTTPClient http;
```

```
  String postData;
  String key = Serial.readString();
  Serial.print(key);
//  postData = "uname=" + key;
//   http.begin("http://myprojectfinal.in/healthm1/view.php");
//  http.addHeader("Content-Type", "application/x-www-form-urlencoded");
//  int httpCode = http.POST(postData);
//  String payload = http.getString();
//  Serial.println(payload);
//  http.end();
//  delay(1000);

HTTPClient http;
//String postData;
postData ="uname= "+String(key);
http.begin("http://patient.fantasysolution.in/miethome.php");
http.addHeader("Content-Type", "application/x-www-form-urlencoded");
int httpCode = http.POST(postData);
String payload = http.getString();

  http.end();

  //Serial.println(payload);
delay(1000);

  HTTPClient http1;
  String postData1;
  //String key1 = Serial.readString();
    postData1 =
"username=fantasy&password=596692&to=8124417446&from=FSSMSS&message=Dear
user your msg is "+String(key)+" Sent By FSMSG
FSSMSS&PEID=1501563800000030506&templateid=1507162882948811640";
     Serial.print(postData);
  http1.begin("http://smsserver9.creativepoint.in/api.php");
  http1.addHeader("Content-Type", "application/x-www-form-urlencoded");
  int httpCode1 = http1.POST(postData1);
  String payload1 = http1.getString();
  //Serial.println(payload);
  http.end();
  delay(1000);

}
}
```

WEB PAGE

```
<?php
include("config.php");
session_start();
extract($_POST);

if(isset($_POST['btn']))
{
$del=mysqli_query($con,"delete from pfd4");
}
?>
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0
Transitional//EN" "http://www.w3.org/TR/xhtml1/DTD/xhtml1-
transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
<head>
<meta http-equiv="Content-Type" content="text/html; charset=ISO-
8859-1" />
<title>PFD</title>
</head>
<body>
<div align="center"><h1>BLOCK BOX</h1></div>
<table align="center" border="3" width="30%">
<tr height="50"
align="center"><th><h3>SL.No</h3></th><th><h3>Date &
Time</h3></th><th><h3>Message</h3></th></tr>
<?php  if($con)
{
 $sqlCheckUname = mysqli_query($con,"select * from pfd4 ORDER
BY id DESC");
$i=1;
while($rr=mysqli_fetch_array($sqlCheckUname))
{
?>
<tr align="center"><td><?php echo $i;?></td><td><?php echo
$rr['date'];?></td><td><?php echo $rr['msg'];?></td></tr>
<?php
$i++;}
}
?>
```

```
</table>
<form id="form1" name="form1" method="post" action="">
<table width="46%" border="0" align="center">
<tr>
<td> </td>
<td rowspan="2"><label>
<input name="btn" type="submit" id="btn" value="reset" />
</label></td>
</tr>
</table>
</form>
</body>
</html>
```

B) SCREENSHOTS

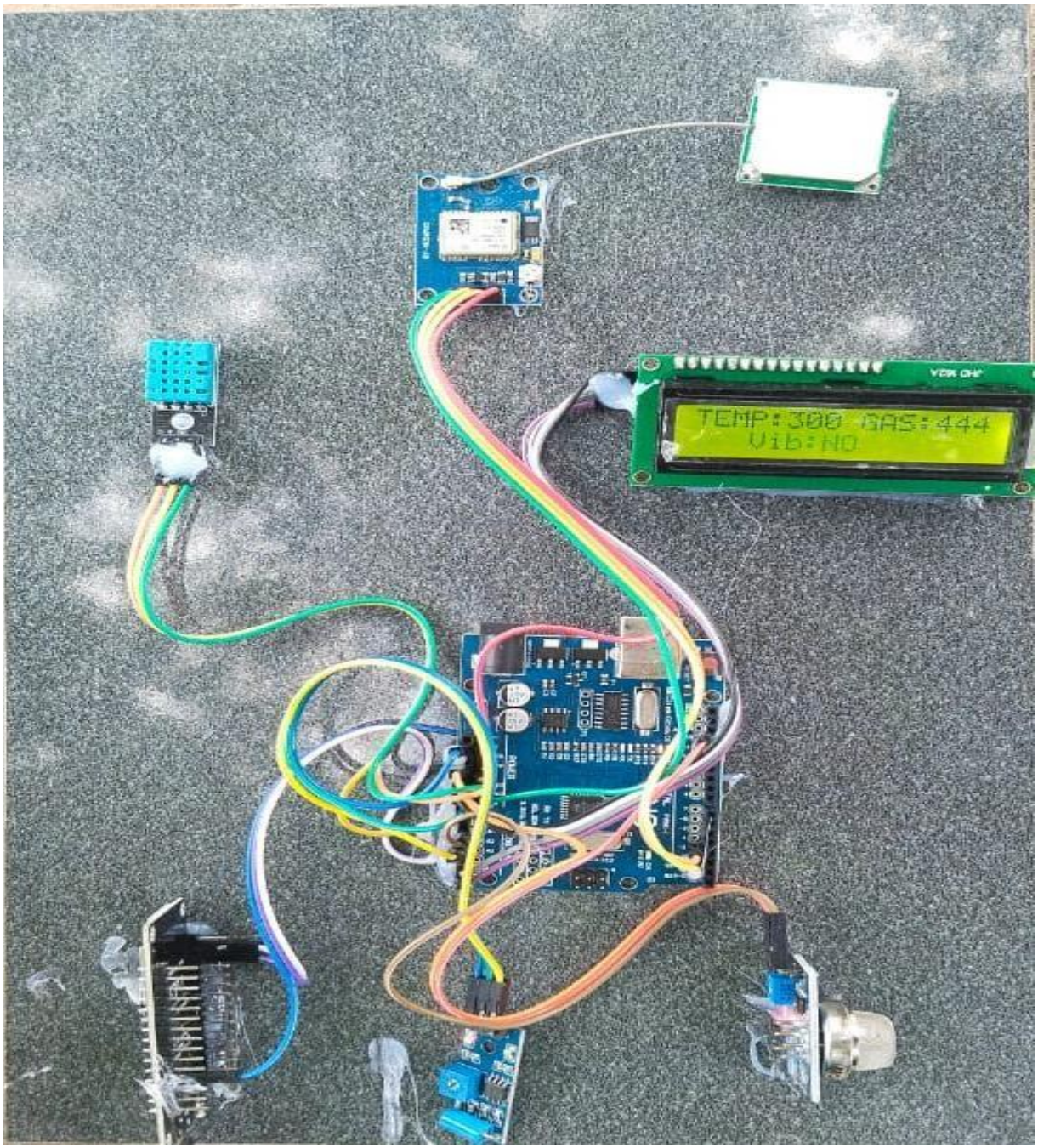

Figure No B.1: Project being tested

BLACK BOX

SL.No	Date & Time	Message
1	24-04-23 09:42:20	*BBOX message temp: 300 GAS: 444 ACCIDENT DETECTED Lan:10.73 Lot: 78.71
2	24-04-23 09:43:27	*BBOX message temp: 300 GAS: 441 ACCIDENT DETECTED Lan:10.73 Lot: 78.71
3	24-04-23 09:43:44	*BBOX message temp: 300 GAS: 427 ACCIDENT DETECTED Lan:10.73 Lot: 78.71
4	24-04-23 09:44:01	*BBOX message temp: 300 GAS: 433 ACCIDENT DETECTED Lan:10.73 Lot: 78.71
5	24-04-23 09:44:18	*BBOX message temp: 300 GAS: 433 ACCIDENT DETECTED Lan:10.73 Lot: 78.71
6	24-04-23 09:44:34	*BBOX message temp: 300 GAS: 433 ACCIDENT DETECTED Lan:10.73 Lot: 78.71
7	24-04-23 09:44:55	*BBOX message temp: 300 GAS: 432 ACCIDENT DETECTED Lan:0.00 Lot: 0.00

reset

Figure No B.2: Data stored in Webpage

Figure No B.3: Data stored in webpage

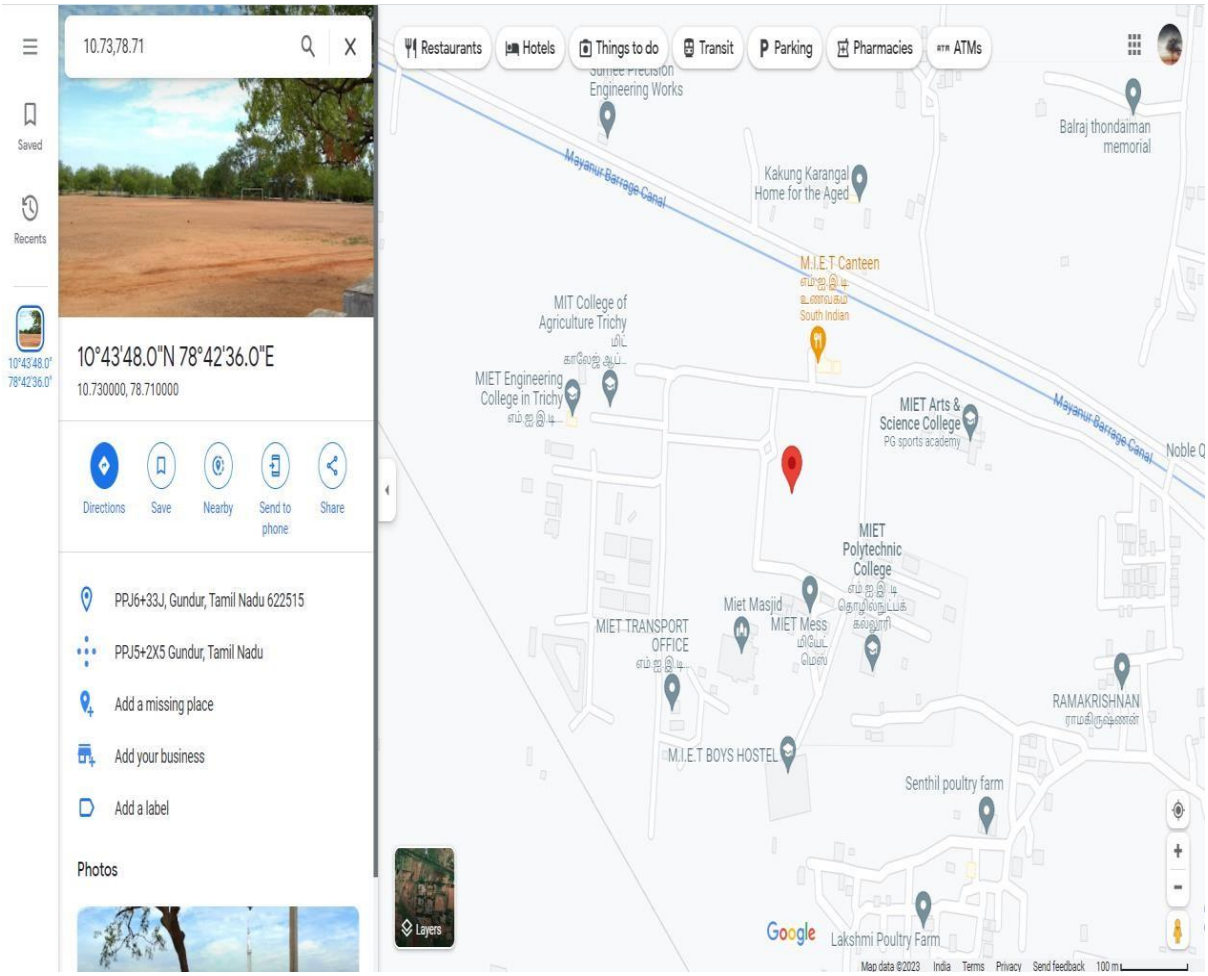

Figure No B.4: Location of Vehicle

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