



# INTELLIGENT VEHICLE SYSTEM FOR ROBOTICS

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## ABSTRACT

Now a day's any consignment carried by a vehicle has to travel in communication until it reaches the destination. Therefore, the fleet owner and the persons sending or receiving the consignment have to wait until the fleet arrives. To track the route of the vehicle and to monitor the various parameters like fuel consumption, location and the temperature of the engine in the vehicle, an intelligent device would come handy to suffice the problem of the fleet operators and the client. The objective of this project is to monitor parameters of a moving vehicle. To fulfill the requirements of such intelligent vehicle monitoring system, this architecture integrates (GPS) Global Position System, GSM module, various sensors and a Microcontroller Arduino R3 wireless in the whole. So, that the system can achieve the function of long-distance real-time monitoring and to control the vehicle. The safety of vehicles is extremely essential for public vehicles. Vehicle security and accident prevention is more challenging. So, in order to bring a solution for this problem this system can be implemented. This technique helps to find out the exact location of the accident or vehicle and with the help of server, an emergency vehicle can be sent to the exact location to reduce the human life loss.

**KEYWORDS:** GPS, GSM module, Arduino R3 microcontroller, sensors

## 1. INTRODUCTION

Vehicle tracking systems have brought this technology to the day-to-day life of the common person. Today GPS used in cars, ambulances, fleets and police vehicles are common sights on the roads of developed countries. All the existing technology support tracking the vehicle place and status. The GPS/GSM Based System is one of the most important systems, which integrate both GSM and GPS technologies.

1. It is necessary due to the many of applications of both GSM and GPS systems and the wide usage of them by millions of people throughout the world.
2. This system designed for users in transport business, provides real-time information such as location, speed and expected arrival time of the user is moving vehicles in a concise and easy-to-read format. This system may also be useful for communication process between the two points. Currently GPS vehicle tracking ensures their safety as travelling. This vehicle tracking system found in client's vehicles as a theft prevention and rescue device. Vehicle tracking systems accepted in consumer vehicles as a theft prevention and retrieval device. If improper functioning of vehicle is observed, system sends the information to the fleet owner.

## METHODOLOGY

### 1. TRANSMITTER END

The transmitter is set up in the vehicle and it consists of a microcontroller to which the GPS and the Bluetooth are connected. The analog signals from the transducer that are used to detect the proposed parameters, are sent to the microcontroller. The microcontroller acquires the position of the vehicle from the GPS and sense it to receiver and the analog values, through the GSM module.

The fuel level transducer, ultrasonic sensor, gas and flame sensor, vibration sensor, Accelerometer, GSM module and the GPS is connected to the microcontroller. The GPS gives the location of the vehicle. All the data collected are sent to the GSM module, which sends the data to the Receiver.

Parameters Monitored and Transmitted

- 1) Location of the Vehicle
- 2) Speed of the Vehicle.

- 3) Fuel Level of the vehicle.
- 4) Distance from one vehicle to other

**RECEIVER END**

The receiver consists of a mobile to which a GSM module is connected to its serial port the information is received by the GSM module and then it is sent to the mobile, which makes use of a map plotting a software to the plot the position of vehicle along with its parameters.

**BLOCK DIAGRAM**

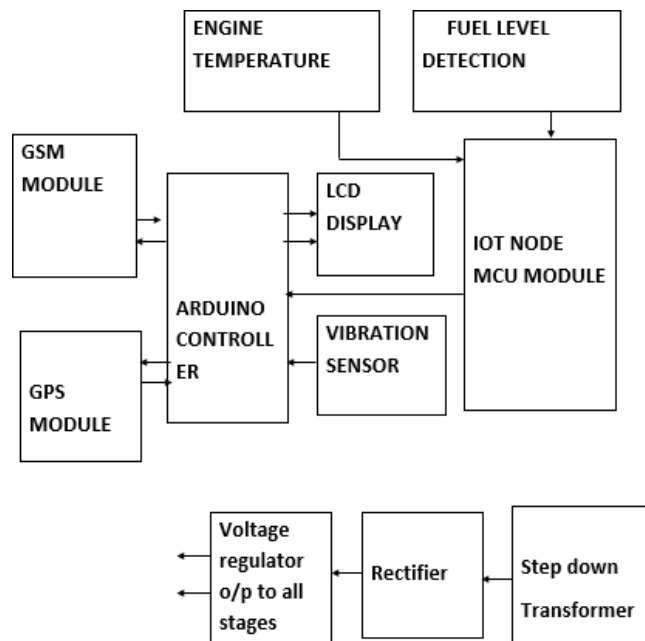


Fig 3.1a| Block diagram of a system for software implementation

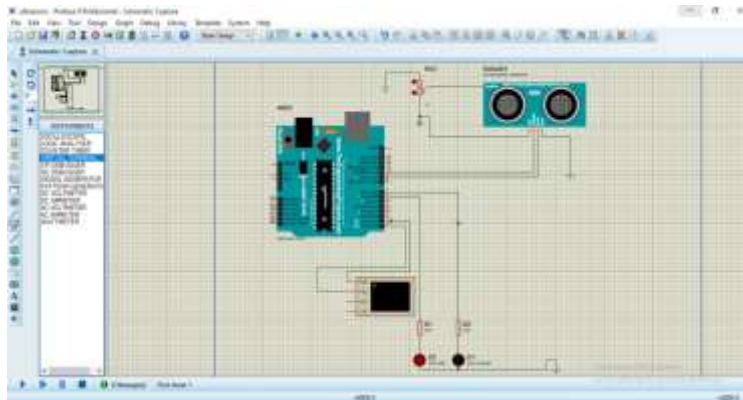
For vehicle monitoring, theft control, safety information and all these applications can be implemented on a child vehicle or any objects. GPS (global positioning system) is used to get positional data on earth, which depends on the satellites movement around the Earth. GPS is an electronic system. We get the exact location coordinates of the vehicle. The project consists of a GPS module, a microcontroller circuit and a GSM module. The above system can be used in a vehicle (car), with the battery for the power supply. When the vehicle is moving, GPS gives the location coordinates, the microcontroller process them and this data is sent as SMS by the GSM module to a known Mobile number. The time interval between the SMS can be preprogrammed in advance. We collect only the location coordinates in this project

**HARDWARE AND SOFTWARE SPECIFICATIONS**

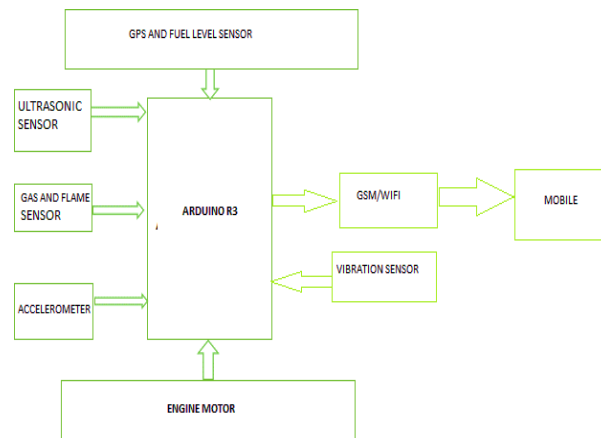
**1.HARDWARE SPECIFICATION**

- 1.GPS Module
- 2.Ultrasonic sensor
- 3.Fuel level indicator
- 4.Vibration sensor

5. Temperature Sensor
6. Gas and Flame sensor
7. GSM module
8. Node MCU
9. Mobile
10. Arduino R3



## 2. SOFTWARE SPECIFICATION



11. Proteus design suite 8.9
12. Programming Language – Embedded C
13. Windows 10
14. SKETCH software to compile C codes for arduino controller
15. BLYNK Software
16. WORKING

As shown above the HC-SR04 Ultrasonic (US) sensor is a 4 pin module, whose pin names are Vcc, Trigger, Echo and Ground respectively. This sensor is a very popular sensor used in many applications where measuring distance or sensing objects are required. The module has two eyes like projects in the front which forms the Ultrasonic transmitter and Receiver. The sensor works with the simple high school formula that

$$\text{Distance} = \text{Speed} \times \text{Time}$$

Working of ultrasonic sensor

• This Vibration Sensor Module consists of an SW-420 Vibration Sensor, resistors, capacitor, potentiometer, comparator LM393 IC, Power, and status LED in an integrated circuit. It is useful for a variety of shocks triggering,

theft alarm, smart car, an earth.

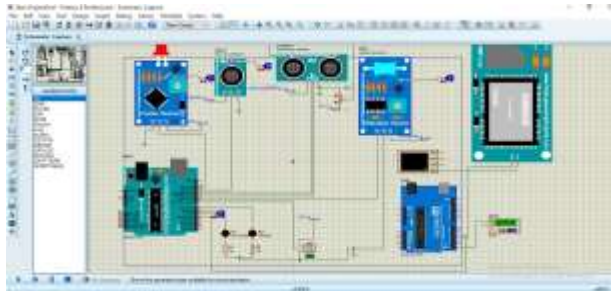
Working of gas sensor □

- The ability of a Gas sensor to detect gases depends on the chemiresistor to conduct current. The most commonly used chemiresistor is Tin Dioxide ( $\text{SnO}_2$ ) which is an n-type semiconductor that has free electrons (also called as donor). Normally the atmosphere will contain more oxygen than combustible gases. uake alarm, motorcycle alarm, etc.

Final Integration of software implementation

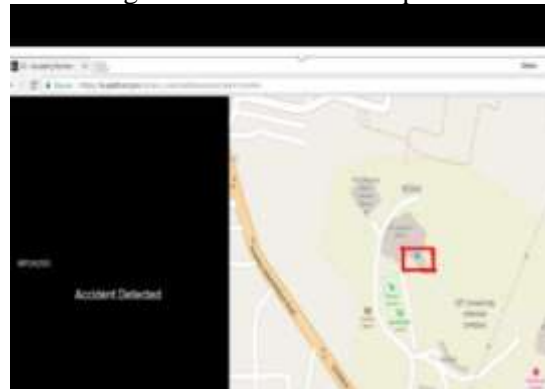
## APPLICATIONS

1. Accident Avoidance system.
2. Vehicle tracking system.
3. Rescue Device.
4. Variable speed limits and alerts.
5. Fuel management



## RESULT

Dummy Accident detected status shown using Virtual Simulation in proteus



## CONCLUSION

The proposed system is successfully implemented using Arduino with various sensor such as vibration sensor, fuel level sensor ,fuel leakage sensor, GPS sensor, accident detection sensor and ultrasonic sensor. Proteus VSM is used to provide dummy information about vehicle location, accident detection to the owner. The abnormal condition of vehicle information will send as an sms notification to the owner. And it was tested for various scenarios and the proposed system is responding precisely. The proposed system made essay for the owner to vehicle real time. Road traffic accidents and fuel monitoring are predictable and therefore preventable.

By implementing these systems we are avoiding vehicle theft and fuel loss, which leads to profit for owner. In future, Data analytics will be done with the help of IoT cloud services.

## LITRATURE SURVEY

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Fig:GPS Module

## SYSTEM SOFTWARE

The Arduino Integrated Development Environment (IDE) is a cross-platform application (for Windows, macOS, Linux) that is written in functions from C and C++. It is used to write and upload programs to Arduino compatible boards, but also, with the help of third-party cores, other vendor development boards.

The source code for the IDE is released under the GNU General Public License, version 2. The Arduino IDE supports the languages C and C++ using special rules of code structuring. The Arduino IDE supplies a software library from the Wiring project, which provides many common input and output procedures. User-written code only requires two basic functions, for starting the sketch and the main program loop, that are compiled and linked with a program stub `main()` into an executable cyclic executive program with the GNU toolchain, also included with the IDE distribution

## 1.SOFTWARE IMPLEMENTATION

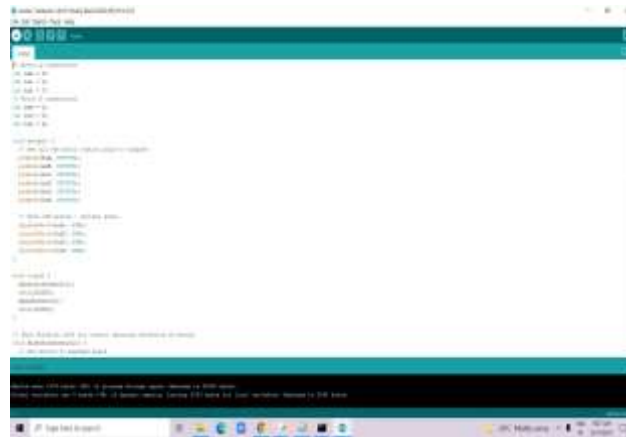


Fig 10.1: Arduino IDE

## FUTURE SCOPE

In the future, we intend to add 'live video streaming' capability to our system so that the parents, as well as the concerned authorities, can view the video showing the condition inside the vehicle in real-time.

We also plan to improve the sensitivity and quality of our pressure pad devices. As we mostly used home-quality materials in constructing the pressure pad devices, they tend to malfunction after being used for a long time. We plan to address this issue by trying out different materials with higher longevity while keeping the material cost as low as possible.

In addition to ideas above, we intend to develop a web-based interface where registered parents or authorized personnel can log into the system from anywhere in the world using a web browser and internet connection and view sensor and other data of a vehicle in real-time.

## CONCLUSION

- 1.The objective of this proposed system is to develop an application which will help to provide security for school going children's.
- 2.This allows parents and management to check the status of secure smart school bus by using GSM.
- 3.The proposed system will provide various facilities like speed control, check drunk and drive, missing children's, accident emergencies, inappropriate drop, panic button, logistic management etc. which are helpful for child security.
- 4.At its most essential, the Internet of Things is a mark for a future in which standard, ordinary things – from family unit machines to autos to mobile devices – are equipped with sensors and associated with the Internet to share their information. Seen all the more extensively, the IoT will offer ascent to a whole environment for interconnected devices, articles, frameworks, and information all cooperating. In this new world, most correspondences will be machine-to- machine (M2M), and there will be a nonstop trade of data between gadgets, sensors, PCs and systems.

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