

# “GPS BASED VEHICLE TRACKING AND MONITORING SY - A Solution for transportation

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**Abstract:** Automobiles are necessary for the movement of goods from one location to another. Consumers may face several problems as a result of delays in the delivery of goods. This delay may be due to drivers choosing incorrect or longer routes when delivering. To avoid these challenges, the Global positioning System (GPS) is increasingly being used for management of vehicle fleets, recovery of stolen vehicles, mapping and surveillance. This paper outlines the design and implementation of a real time GPS tracker system using Arduino. When a user makes a call on the number that is registered on the GPS-GSM shield attached to Arduino, the user receives the location continuously on the SD card simultaneously. This proposal has significant application for proposal has significant application for vehicle security, salesman tracking and private drivers.

**Key Words:** Arduino UNO, GSM, GPS, Storage card, LCD Display

## 1. INTRODUCTION

With advancements in technology, there has been an increase in the usage of vehicle tracking systems. The design of vehicle tracking systems enable the display of a vehicle's position is updated every 10 seconds as the vehicle is moving. Vehicle tracking systems are very useful now days. This technology popularly called real time Vehicle Tracking systems has proved useful in ensuring the security of vehicles. This hardware is Tracking Systems has proved useful in ensuring the security of vehicles. This hardware is fitted on to the vehicle in such a manner that persons who are in or outside of the vehicle cannot see it. Thus, it is used as a convert unit which continuously, or as a result of interruptions to the system, sends location data from the tracking system can be used to find the location and so inform the police for further action. When users make a request, the GPS coordinates of the vehicle are sent to a specified mobile. The user will be provided with the position of latitude and longitude which can be viewed using Google Maps. Additionally, the system has an SOS feature whereby the driver can press a button to get help for an emergency. This service is typically provided at a low cost. This service is typically provided at a low cost. This information is available

to authorized users of the via internet users of the system via internet websites[1].

### 1.1 Related Work

The hardware and software of the GPS and GSM network have been developed. The proposed GPS/GSM based system has two parts. The first part is a mobile unit and the second is a controlling station. All system processes including the various interfaces for transmission of data have worked successfully. These results are compatible with current GPS technology [2]. A vehicle tracking system is a device that is fitted in a vehicle, to enable the vehicle location. This paper proposes the design of a vehicle tracking system that utilizes GPS and GSM technology. This system build based on an embedded system, can be used for tracking and any car through GPS - Global positioning system and GSM- Global system for mobile communication. This design will continuously monitor the location of a moving vehicle and report the location of a moving vehicle and report the status of the vehicle on demand[3].

Face Detection system will be used to detect the face of the driver, and compare with a predefined face. If for example a car owner is sleeping while an individual steals the car, the Face Detection System will obtain images via a tiny web camera that is hidden in the car. The Face detection System will compare the obtained images with the stored images. If the images do not match, then the information is sent to the owner through GPS. The location of the car and its speed can also be displayed to the owner through SMS. The owner will be able to see images of the thief, as well as the vehicle location. As can be seen this system can be utilized in our day-to-day life [4].

In this approach, the system is in a position to observe the extent of the harmful gases like CO, LPG and alcohol among the vehicle, Associate in Nursing provides alerts through an alarm in dangerous situations. An SMS are going to be sent to a certified person through the GSM. In this method, the IR Sensor is used to detect the static obstacle in front of the vehicle and the vehicle will stop if any obstacle is detected. This mechanism can aid in avoiding collisions with obstacles [5].

Kai-Tai Song and Chih-Chieh Yang created a real-time, visual, vehicle safety tracking system. This paper outlines a

unique feature-filled vehicle-tracking algorithmic rule, ready to mechanically detect and track many moving objects like cars and motorcycles, earlier than the following vehicle. In conjunction with the idea of focus of growth (FOE) and think about analysis, the system will isolate options of moving objects from moving background and supply a collision word of warning in real-time. The projected visual following system has been valid in real road tests. The results give collision warning info in urban areas, with speeds of about 60 km/hour both at night and day times. A remote observance system supported SMS and GSM was enforced, inclusive of the hardware and software designs. This paper notes that remote signals are often transmitted through the GSM network. This includes two parts: the monitoring center and the remote monitoring station. First, the observance center is created from a laptop and also the GSM communication module. The software-monitoring center and the remote monitoring station were implemented using VB. The result of this demonstration shows that the system can control

### 1.2 Proposed System

This paper proposes a vehicle tracking system for tracking vehicle theft using GPS and GSM technology. The GPS receiver and GSM electronic equipment utilizes Arduino UNO. The system is affixed to the vehicle. A GSM movable is wont to send and receive the data. Therefore, the GPS system can send the longitudinal and angular distance values admire the position of auto to the GSM electronic equipment. If as an example, an individual forgets where their vehicle is parked, an SMS can be sent to the vehicle GPS, The SMS sent would be transmitted through the GSM service provider thereby reaching the vehicle. The vehicle will have a GSM device installed, which includes a SIM card.

Through the GMS electronic equipment, the SMS will be received and sent to the Arduino UNO in the vehicle. Upon receipt of the message, the Arduino UNO checks the password and the request. If everything matches then it'll perform the request needed by the owner by causation a link that has line of longitude & latitude through Google Maps, showing the location of the vehicle. communication between the monitoring center and the remote monitor.

### 2. Block Diagram:

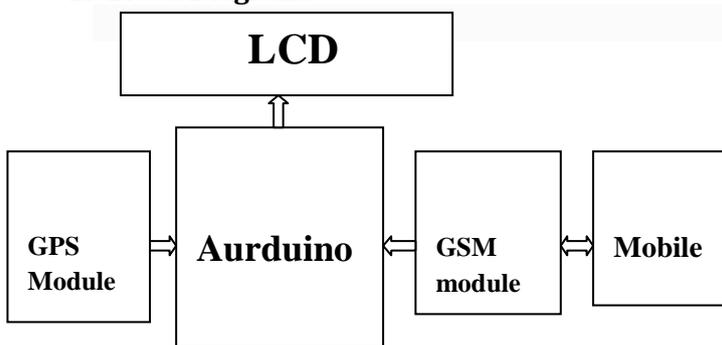


Fig. Block Diagram

### A. Arduino UNO

The Arduino is an open source, which means hardware is reasonably priced and development software is free. The Duemilanove board features an Atmel Atmega328 microcontroller operating at 5V with 2kb of RAM, 32 kb of flash memory for storing programs and 1 kb of EEPROM for storing parameters. The clock speed is 16 MHz, which translates to about executing about 30,000 lines of C source code per second. The board has 14 digital I/O pins and 6 analog input pins. There is a USB connector for talking to the host computer and a DC power jack for connecting an external 6-20V power source, for example 9V battery. Headers are provided for interfacing to the I/O pins using 22 g solid wire or header connectors.



Fig. Arduino UNO

### B. GPS MODULE:

The NEO-6 module series may be a family of complete GPS receivers that includes the high performance u-blox vi positioning engine. These versatile and value effective receivers supply various property choices in an exceedingly miniature sixteen x twelve.2 x 2.4 millimeter package. Their compact design and power and memory choices create NEO-6 modules ideal for battery operated mobile devices with terribly strict price and area constraints. The 50-channel u-blox vi positioning engine boasts a Time-To-First-Fix (TTFF) of underneath one second. The dedicated acquisition engine, with a pair of million correlators, is capable of large parallel time/frequency area searches, enabling it to seek out satellites instantly. Innovative style and technology suppresses electronic jamming sources and mitigates multipath effects, giving NEO-6 GPS receivers glorious navigation performance even within the mostly



Fig. GPS Module

**D.GSM Module( SIM 900a):**

This module is associated with Raspberry pi board which helps in making calls and sending instant messages which contain current location of the vehicle, the current location



Fig.GSM Module

comes from GPS to it

**E.LCD Display :**

A liquid-crystal display (LCD) is a flat panel display, electronics visual display, or video that uses the light modulating properties of liquid crystals. Liquid crystals do not emit light directly.LCD's are available to display arbitrary images or fixed images which can be displayed or hidden, such as a preset words, digits, and 7-segment displays or hidden, as in digital clock.In our system LCD display is used to display the longitude and latitude which are associated with the current location of the vehicle

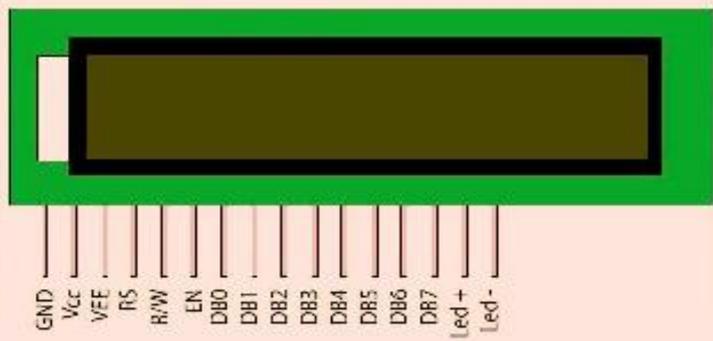


Fig. LCD display

**F. Software Requirement:**

In Arduino we have to use Arduino IDE to do programming. We can programme using C or C++ in it. In our task we use C to make association with Arduino.

**2.1 Working:**

An Arduino UNO is used for interfacing to various hardware components. The proposed design will allow for the continuous monitoring of vehicle status, and provision of reports as requested. To enable this reporting, an Arduino UNO is interfaced with a GSM Modem and a GPS Receiver. The electronic equipment is employed to send the placement of the vehicle from a far off place. The GPS electronic equipment can unendingly give information showing the

position of the vehicle. The GPS electronic equipment provides several parameters in its output, such as whether the vehicle is moving or is parked. This information are going to be sent to the user mobile upon demand. This vehicle tracking system takes input from GPS and sends data through the GSM module to the desired mobile. Vehicle Tracking Systems are among the biggest technological advancements for monitoring vehicle activity. the protection system utilizes GPS to search out the placement of the vehicle being half-track or monitored. Subsequently, satellite systems are used to send the coordinates and the location data to the monitoring center. At the monitoring centre, various software is used to locate the car on a map. In this means the vehicle house owners ar ready to monitor their automobile in real time. Due to this real-time tracking facility, owners of expensive cars have become increasingly interested in vehicle tracking technology.

When the GPS tracking system is insulated in a car, the system will run automatically and provide data updates on the move by sending SMS messages. The features of this design include:

- ☑ Users can set their own speed limit. If the car goes over the speed limit, the user will get alert message saying, "The car has exceeded the speed limit of ...miles";

- ☑ When the vehicle begins to move, or comes to a stop, the user will receive an alert indicating the location. This will aid in ensuring the driver does not take loner routes, or stop in locations that is not the final destination. The user can shut down the car engine. Therefore, if the car begins to move without the user's knowledge or consent, they can stop the engine by sending a SMS.

**G.Some Important Results:**



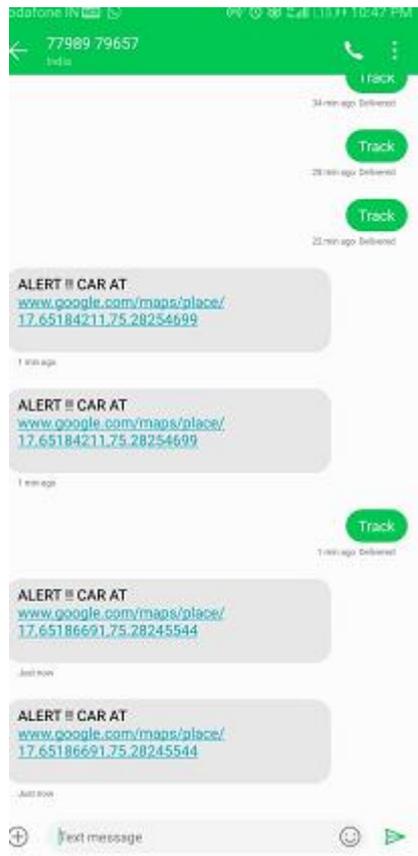


Fig.Result 2

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## 3. CONCLUSIONS

This paper notes the raised demand for vehicle following systems for following the larceny of vehicles through GPS and GSM technology. this technique is used for each personal and business functions to enhance safety and security, communication, and performance observation. Vehicle following systems became a lot of necessary in giant cities and square measure more secured than several alternative systems. Nowadays, vehicle larceny is quickly increasing. With this technology but, vehicle larceny is higher controlled. This technology can even facilitate to advance transportation systems, and may be employed in several organizations for security and following functions. Also, the projected system is additional helpful, as a results of the addition of various forms of sensors that facilitate to within the event of Associate in Nursing accident, the system can send the placement to selected numbers therefore help is provided as before long as doable. this can be significantly helpful in instances wherever accidents occur in deserted places and midnights. within the future, this vehicle following and accident alert feature can play a very important role in regular life.