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# Node Tracking Module using GPS system

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**Abstract**— The paper presents an Internet of Things (IoT)-based system to track and monitor the health of soldiers. In today's world, war is an important factor for the security of any nation. First, the GPS continues to receive input data from the satellite and store the latitude and longitude values in the AT89s52 microcontroller buffer. If you need to track the vehicle, you need to send a message to the GSM device to activate it. It is also activated by detecting a crash on the vehicle's shock sensor. In parallel, turn off the GPS using a relay. After the GSM is activated, it takes the last latitude and longitude value received from the buffer and sends a message to a specific number or laptop that has been defined in the program The ability to track vehicles is useful in many applications such as passenger vehicle security, public transportation systems, fleet management, and more. Therefore, the development of vehicle tracking system using Global Positioning System (GPS) and Global Communication System (GSM) modem is done so that users can find their vehicles easily and conveniently.

**Keywords**— Vehicle tracking; Microcontroller; Google Maps Smartphone, Arduino UNO; GPS Module
GSM Module, LCD

## I. Introduction

The main objective of the vehicle tracking system is to ensure the safety of all vehicles. The main goal of the accident warning system is to save people in accidents. These are enhanced security systems for vehicles. The latest ones like GPS are very useful today, this system allows the owner to track and trace their vehicle and find out the movement of the vehicle and its past activities. This new technology, popularly called vehicle tracking systems, which has created many wonders in vehicle security. Thus, it is used as a hidden unit that sends location data to the monitoring unit continuously or during any system interruption. When a vehicle is stolen, the location data from the tracking system can be used to locate the vehicle and inform the police of the next course of action. Some vehicle tracking systems can even detect unauthorized vehicle movement and subsequently alert the owner. This provides an advantage over other technologies for the same purpose. In it, this accident alert system detects the accident and the place where the accident occurred and sends the GPS coordinates to the specified mobile, computer, etc. The vehicle tracking system is used to track the position and location of the vehicle. It is placed on every vehicle like trucks, buses and cars to get the exact location of the vehicle using GPS in terms of latitude and longitude from remote areas. When we use these latitude and longitude values in Google Earth, we get the exact area of the vehicle. We can calculate the distance travelled between two stations and we can also track the vehicle in any weather conditions.

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## II. Prospective Application

A Node Tracking module has its own prospective applications in various fields and settings.
Here are some potential use cases:

Food Industry: In the food industry, a node tracking is also used as to check the location of that delivery boy and ensuring food safety and quality.

Education Industry: In the education industry, a node tracking module is also use as child safety and give the live location of that child it may also use to track the school bus.

Detection Theft: we can use our Node Tracking system to detect the thief if he tried to escape from police by installing the node to its handcuffs.

Overall, the Node Tracking system is basically reducing the criminal escapes, deliver the food on time, safety of child and etc. it will manage time and work as smartly.

## III. Node Tracking Module

### *A. Architecture*

This project proposes to design an indoor system to track and locate any vehicle using Global Positioning System (GPS) and Global Network for Mobile Communication (GSM). In this project, Arduino Uno is used to interface to various hardware peripherals. The current design will continuously monitor moving Vehicles and report Vehicle status on demand. For Arduino Uno is serially interfaced to GSM Modem and GPS receiver. A GSM modem is used to transmit the location (latitude and longitude) of a vehicle from a remote location. The GPS modem will provide continuous data, i.e. latitude and longitude indicating the position of the vehicle. The GPS modem data output is read by the microcontroller and displayed on the LCD. The same

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information is sent from the mobile to the other end where the location of the vehicle is requested. EEPROM is used to store the data received by the GPS receiver. The device is connected to a microcontroller LCD display, a GSM modem and a GPS receiver. When the user's request is sent to the number on the modem by dialling, the system sends an automatic response to the user's mobile phone showing the location of the vehicle in terms of the google map link by clicking on the user. can track the vehicle. An application is configured which is used to locate the vehicle and send SMS to the registered user's phone number.

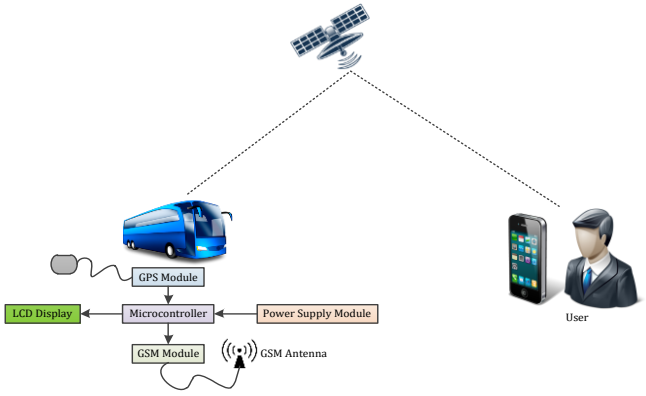


Figure 1: System Structure

## IV. Challenges And Future Scope

- Sometimes GPS may fail thanks to certain reasons and therein case you would like to hold a backup map and directions.
- If you're using GPS on A battery operated device, there could also be A battery failure and you'll need a external power supply which isn't always possible.
- Sometimes GPS signals aren't accurate thanks to some obstacles to signals like buildings, trees and sometimes by extreme atmospheric conditions like geomagnetic storms.
- GPS chip is hungry for power which drains battery in 8 to 12 hours. this needs replacement or recharge of battery quite frequently.
- GPS doesn't penetrate solid walls or structures. it's also suffering from large constructions or structures.

**System Complexity:** As systems become more complex, there is a greater potential for system failures and errors. Automatic temperature controllers must be designed with robust error-handling and fault-tolerance mechanisms to prevent system failures and reduce downtime.

**Cost:** The price of the gadget is very high. Also, people have to pay monthly for the service. Traffic is very common in this city life. Every day many mistakes happen on the road. Therefore, the need for security and control is enhanced. To solve such problems, systems using GPS and GSM technology were developed and implemented
shown in the research. We face different challenges:
1. In a critical situation (when the car is stolen) a person is confused about what to do
2. If a person has something valuable and wants to check it regularly
3. Find the shortest path The system overcomes all these problems.

### FUTURE SCOPE

Today's GPS trackers are more compact and powerful than a few years ago. GPS tracking devices are constantly changing and improving. Before you have the opportunity to follow the latest changes in GPS technology, new items can protect you. Given this dynamic landscape, we will focus on the future scope of GPS tracking from marketing to adapting to new technologies.

As location and positioning technology continues to evolve including the latest GPS trackers and other technologies such as geo-fences and beacons, we can only expect GPS trackers to become even more powerful in the future.

An increasing number of companies are adopting GPS technology as a cost-effective way to monitor and track vehicles, field personnel, and other critical company assets.

Businesses are increasingly using GPS-enabled vehicle tracking systems to evaluate driver performance and track company executives on business trips. It has been proven to be incredibly effective in increasing productivity and efficiency in many businesses.

### CONCLUSION

Development of a hardware prototype of a vehicle tracking system. The system can retrieve the vehicle's GPS coordinates and send them to the user's phone using a GSM modem. Advanced vehicle tracking systems provide real-time vehicle tracking capabilities that can be used for personal vehicle safety, public transportation systems, fleet management, and many other applications. The system can

provide improved uniqueness, global performance and cost compared to existing solutions. The tracking module receives the data sent by Miss Call, processes it and displays the location of the vehicle on Google Maps.

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