Study of GPS Tracking System

Gauri Naik
Research Scholar
TIMSCDR, Mumbai

Shilpa Naik
Research Scholar
TIMSCDR, Mumbai

Divyam Nayak
Research Scholar
TIMSCDR, Mumbai

Sreeja S. S.
Assistant Professor
TIMSCDR, Mumbai

ABSTRACT
This Project offers a self-propelled localization system which uses GPS and GSM-SMS services. The system permits localization of the automobile and transmits the position to the owner on his mobile phone in the form of short message more specifically an SMS. This system can be interconnected with the car alarm system and it alerts the owner through his mobile phone. This tracking system is collection of a GPS receiver, Microcontroller and a GSM Modem. GPS Receiver acquires the location information from satellites in the form of latitude and longitude. The information is processed by the Microcontroller and is sent to owner using GSM modem. This application is low cost solution for determining the automobile position and status it is very useful in case of vehicle theft situations, for monitoring adolescent drivers by their parents as well as in car tracking system applications. GPS system along with other devices can be used in many other ways.

General terms
IP address, SIM card

Keywords
GSM,GPS,SMS,GPRS

1. INTRODUCTION

1.1. Motivation
The motivation for this research is the aspiration for advanced features in an already used technology. Currently there is no single system that integrates all tracking and tracing of any movable objects, there exist applications but all of them work separately so integrating all of them was the source of motivation for our team.

1.2. Need of GPS
You may think that a GPS tracking device is to take you from point X to point Y when you are unsure of which location you are when you are driving, but did you have any clue this system collaborated with other system can be used as solutions for different problems? GPS tracking systems is a kind of tracking system that is used to track anyone and anything these days. Technology has swiftly advanced in the past few years and it has become very easy for the average person to use such a tracking system. In order to avoid your vehicle from getting stolen you will want to place a GPS tracking system under your dash or in glove compartment. Every second counts with a lost or abducted child, so a tracking device is imperious to avoid a terrible and painful outcome. To secure the valuable items likejewelry or electronic instruments a GPS tracking system can be used. There are also various tracking systems that can trace items inside buildings and parking garages.

2. WORKING

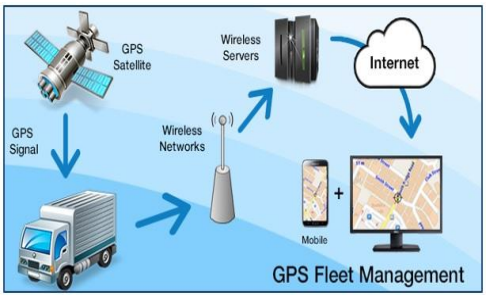

Fig1. Procedural diagram of GPS Tracking System[3]

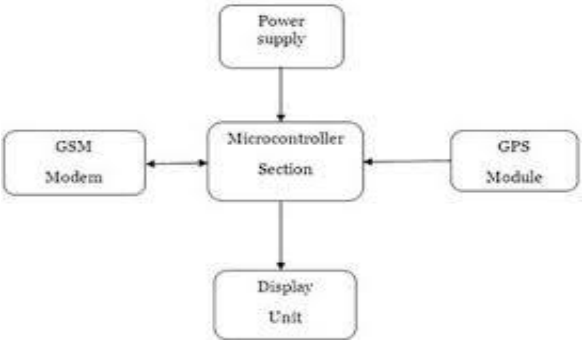

Fig2. Block Diagram of GPS Tracking system [1]

The GPS satellite gives the exact location of the device which is placed in the car. This device is in turn which is connected to the local GSM service provider through a GSM network as it has SIM card existing in it thus the GPS parameters which the device has are directed to the tracking server which has a Static IP address through a GPRS network. The tracking server comprises of a Socket listener application running in the back-ground which listens at a particular port. The GPS parameters established by the port listener are given to the Parser and converter for proper alterations and this data is stored in the database. These values from the database are raised and are manipulated to get the reports in proper format.

3. ALGORITHM ANALYSIS
The algorithm is used for GPS location tracking is based on three time lock GPS status. So it has three for loops present.

The algorithmconsistsof the following steps:

- Check Number of Satellites Visible = x
- If (x>3) then get the lat and long
- It checks this condition 3 times for getting confirms lock.
- So the time complexity of this algorithm is O(x^3).
- The space complexity of this project dependent on the data which the client wants to pile in database. Increase in the duration of data will gradually increase the space complexity. [2]

4. SYSTEM SPECIFICATIONS

4.1. Hardware Interfaces

Internet connection for Client pc.

Static IP for Server.

AVL (Advance Vehicle Locator) Device.

GSM SIM Card with GPRS activated. [2]

4.2. Software Interfaces

FM1100 Configurator (for configuration of AVL)

Microsoft Visual Studio10.

.Net framework 3.0/greater. [2]

4.3. Communication Interfaces

The only communication interface for our system is Internet. [2]

4.4. Non-functional Requirements

4.4.1. Performance Requirements

System should take least time for report generation. The system performance must not act by the number of automobiles present. The web pages should not take much time to load the pages.

4.4.2. Security Requirements

System should not allow authentication to any unauthorized person. The system should not be exposed to the security attacks. Information related to Admin password should be con denial.

5. WAYS IN WHICH GPS COULD BE USED

As we know the rate of robbery and theft of vehicles is increasing day by day. We, in this paper propose a solution for this which is that GPS along with GSM and an app could reduce the robbery rates. We could develop an app which the user can activate when he/she is leaving the vehicle. If the vehicle is being robbed, a message would go to the user's mobile using GSM informing him/her that the location of the vehicle has changed. The app can be deactivated when not needed or when user himself is using the vehicle. With robbery there is another major problem of road accidents. A device could be designed using Arduino chip, accelerometer, gyro sensor, GPS and GSM that would be installed into the vehicle. If an accident takes place, the gyro sensor will sense it, send a message to the user's relatives which would be fed in the app prior and also to the hospital. This could provide fast help to the user.

6. CONCLUSION

Instead of using GPS alone, integration of GPSand GSM would be very useful for tracking objects.This system can be further extended for numerous applications as follows:

- Anti-theft system for cars as well as bikes.
- Handling of public transports likes buses and trains.
- Tracking of valuable assets.
- Fleet Management of cars.
- As a vehicle management software for transport companies

A future invention could be a product that could be used to detect a 'bike accident' to provide immediate medical assistance to the victim after a road accident.This product can be implemented usingcombination of hardware & software.Hardware components consisting of Arduinoboard, GPS transmitter, and gyroscope &.accelerometer sensors will be integrated together. A program will be hard coded onto the chipset. A program will be hard coded onto the chipset.And many more related applications thus, this system can prove to be very helpful in future.

7. ACKNOWLEDGMENT

It gives us immense pleasure to present this Research Paper. We grab this opportunity to express our heartfelt obligation towards the people without whom completion of this Research Paper have not been possible. We would like to thank our guide Prof. Sreeja.S.Sfor her immense support and continuous encouragement to our team.

8. REFERENCES

[1]https://www.academia.edu/12234429/Research_paper_on_VEHICLE_TRACKING_SYSTEM_USING_GPS_AND_GSM_

[2] http://www.ijeert.org/pdf/v2-i7/9.pdf

[3] www.google.in