Smart GPS Tracker Using Arduino

Harsh Vardhan Shekhawat[1], Akash tyagi[2], Nishant sharma[3] , Inder Kishor[4]

[1,2,3]Student, Department of Computer Science & Engineering, AIET, Jaipur, Rajasthan

[4]Assistant Professor, Department of Computer Science & Engineering, AIET, Jaipur, Rajasthan

ABSTRACT

Our main motive of this paper is provide security or safety to user in terms of tracking their devices or valuable items. In this paper also we are going to present the hardware and test results of a Smart GPS Tracking system based on GPS technology, Arduino system, Arduino IDE open source software, Google maps etc. This Smart GPS tracking device may be installed in all official vehicles so with the help of this applications in cutting down fuel expenses and to reduce misuse of official vehicles. This system offers easy availability, low power consumption, and cost-effective solution.

Keywords-Smart GPS tracker; ARDUINO , GPS module , live tracking

Introduction

All In a day, many people travel from one place to another place. While traveling, many people may carry valuable items. There might be a chance of losing/stolen of the items. No airline service provider or any other travel service provider, provides the real-time tracking feature/service to track the passenger's bags, if it got lost/stolen.

Similarly, in vehicles, any vehicle company is not providing any tracking system to track[2] the vehicle when it is stolen. We know generally cost of vehicle[3] will be high, so losing the vehicle cause people more stress.

To overcome these such types of problems, we build a Smart GPS tracking system

This device user used also for the following things :

1.Child :- Now a days our children goes out for schools and tuition classes so parents are worrying for them so get rid off this problem , parents put this device in children's bag.

2. The system can be installed in our vehicle. After installation of device, we can easily track our stolen vehicle with the help of mobile phone. we can also use this application to track the school bus

PROPOSED SYSTEM

A.   GPS Module

GPS means Global Positioning[4] System and it is used to detect the Latitude and Longitude of any location on the Earth, with exact Universal Time Co-ordinate time.

 This device receives the coordinates from the satellite for each and every second, with time and date.
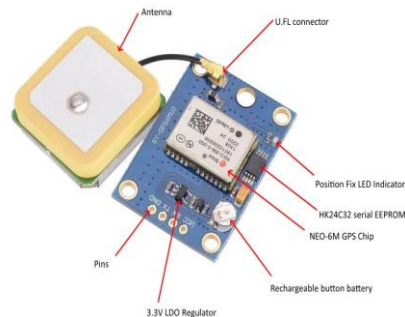

Figure 1 GPS Module

GPS offers great accuracy

It uses an NMEA protocol to track the GPS data. This is an ASCII based protocol which usually starts with the "$" symbol with carriage return/line feed

B. ARDUINO

Arduino is an open-source platform and it is used for building the projects of electronics. Arduino have both physical programmable[5] circuit board and a piece of software ,IDE that runs on your computer, and we can use to write and upload computer code to the physical board.We are using Arduino NANO in this project. Arduino Nano is a small, compatible and flexible breadboard friendly Microcontroller board, developed by Arduino.cc in Italy, based on ATmega328p.Arduino Nano micro controller is a smaller version of Arduino UNO[6] , it means both has almost same functionalities.It comes with an operating voltage of 5V, however, the input voltage can vary from 7 to 12V. Arduino Nano pinout contains 14 digital pins, 8 analog Pins, 2 Reset Pins & 6 Power Pins.

Figure 2 Arduino Nano micro controller

GSM MODULE

- GSM is mobile connection modem ; GSM refers as global system for mobile communication[7]
- GSM is widely used for mobile communication system in all over the world.
- GSM module is a hardware device which is used for GSM mobile telephone technology to provide a data link to a remote network.

We are using 4g GSM module in this project.

SIM7600 variant SIM7600EI[8] is a complete multi band LTE GPRS/GSM module solution in LCCtype which supports LTE 1up to 10Mbps for downlink and 5Mbps for uplink data transfer[9].

Designed in the compact and unified form factor, which allows the customer to design their application once for different technology and benefit from great development time-saving[10]
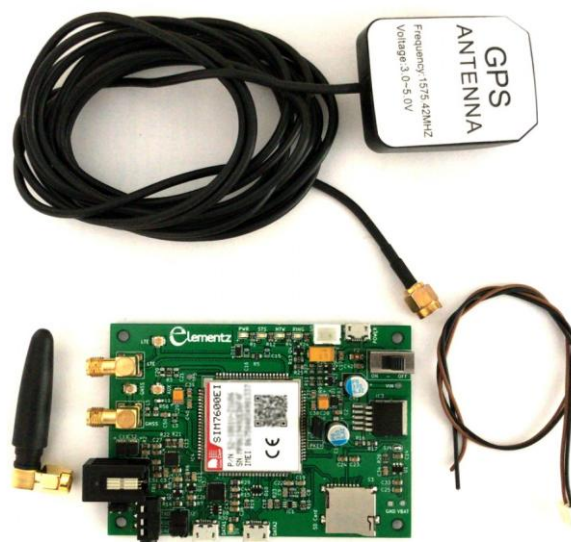

Figure 3 GSM Module

D. WIFI SENSOR / MODULE

What makes our project different from others ? Answer is WIFI sensor module . Sometimes, We all are facing problem of network connectivity .

Figure 4 Sensor Module

So get rid of this problem we are using WIFI sensor [11]. Wherever, This device face problem of network connectivity so with the help of WIFI sensor this device automatically search the open WIFI network and connect with it .

HOW THIS DEVICE WORKS ?

First of all power this device and wait for some time , now our device is ready for use. Now we can track live location (24*7) of user[12] / vehicle / other objects in our phone.

Figure 5 Live Location

FUTURE SCOPE OF THIS PROJECT

We can use this device for women Saftey (we will make our device even more compact and small. So that our device can keep easily in any small things like hand). In future we will also work on how can we take patient (driver / passenger) fastly to hospital like we implement smoke or gas sensor in this device so whenever accident will happen , we receive alarm so we can contact with ambulance or hospital

CONCLUSION

A Smart GPS tracker system has been successfully implemented. This device or system divided into three main subsystems GPS, GSM, and Arduino .subsystem. as we earlier discuss about gps , gsm and arduino. We are using gps module for describe the position of the our devcice in the form of longitude and latitude and after this both(longitude and latitude) is received by the GSM. And then GSM send this info to the trackers of device . Arduino [13] is used software (IDE) that write computer and used to write and upload computer code to physical board. And we are using google map to improve the accuracy of this system. . Google Map gives main enhancement first then improves the accuracy of tracking location of our device So it provides the additional functionality which requires high accuracy and also extract location of device . For further work a high scale deployment can accomplished. So this device provide live tracking so we easily track live location[14] of any vehicle , our children and also important thing like we can implement this device in our jewelry box so we can easily track our jewelry box.

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