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# Design and Implementation of IoT Based Vehicle Monitoring and Tracking System

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**Abstarct:** Recently, the significance of vehicle checking and global positioning framework has been expanded quickly. The significant worry of the proposed framework is distinguishing the vehicle robbery by carrying out enemy of framework. Vehicle global positioning framework is gainful from numerous points of view, for example, giving security to the cabs, taxis, school transportation, individual vehicles, taxis, taxis, school transports/vehicles and others. Global positioning framework is created by utilizing GPS and Raspberry pi to find the client's vehicle area. GPS module is utilized to follow the area of the vehicle as qualities like scope and longitude. These qualities are communicated to the client utilizing Wi-Fi modem through web. Results shows that we can screen client's vehicle area by means of their PDA utilizing web Blynk versatile application is utilized to screen the client vehicle area at whenever and anyplace on the planet. This is open-source android application to give UI to screen or control different IoT gadgets, this application works dependent on MQTT convention. This framework effectively tried to demonstrate assisting clients with finding their vehicles in case of a burglary

Key words: Raspberry pi, installed frameworks, GPS, Internet of Things

## 1. Introduction

A great many autos are lost every year in the state and a large number of cars are likewise recuperated by the Police from when they get the offenders or in any event, when the guilty parties leave the vehicles they have taken after they have utilized them. The standard issue with the recuperated vehicles arriving at the real proprietors is that the vehicle need not be found in a similar purview as one in which the protest was dispatched. Thus, when a vehicle is recuperated, typically the Police attempt to follow out the genuine proprietor of the vehicle from the RTO dependent on the permit and frame number. In any case, this is an extensive and tedious cycle for the RTO to follow out the genuine proprietors from the records and illuminate back to the Police stations. On account of these deferrals, vehicles that are recuperated all significant time-frame to really arrive at their proprietors. Regardless of the different advances that have been acquainted as of late with identify vehicle

Robberies and following it, It was accounted for that as numerous as vehicles were taken yearly on the planet. As per NCIC, in 2006, 1,192,809 engine vehicles were accounted for taken, the misfortunes were 7.9$ billion. A few security and global positioning frameworks are intended to help enterprises with huge number of vehicles and a few use purposes. An armada the board framework can limit the expense and exertion of workers to complete street tasks inside an insignificant time. [1][2]This project comprises of an android based distant vehicle separating framework will give viable, continuous vehicle area, planning and detailing this data worth and add by improving the degree of administration gave. A vehicle global positioning framework will advise where your vehicle is and where it has been, the means by which long it has been.

The improvement of vehicular plan acquires public numerous accommodation life yet additionally brings numerous issues simultaneously, for instance, gridlock, trouble in checking dispersive vehicle, robbery and other arrangement of issues [4].We are expected to made this observing remote utilizing RASPBERRY PI equipment stage ported with ongoing working framework µc/OS-Vehicle is the essential spot where security starts. In these days, auto logo thefts are extending. In India, logo of vehicle is taken at ordinary stretches upsetting experiences. Hereafter we should require vehicles to outfit with the latest example of headways and measures to make it a protected from criminal. The security system has been improved on the whole fields in the overall population. Vehicle security has moreover achieved various quick changes, yet the costs of all the security upgrades are so high and it isn't moderate for all the vehicle owners. This endeavor is intended to offer the best security response for auto logo at sensible cost. Here, we make an undertaking to add to a structure considering raspberry pi-3 advancement. In proposed structure we show an answer on the most ideal approach to get the auto logo. With this structure when someone is

endeavoring to take the auto logo it alerts the auto owner when he is at nearest partition and moreover when he is a long way from the auto. The structure thus cautions the auto owner and gives unusual state security. The Raspberry Pi 3 model B+ is the second time Raspberry Pi. It displaced the main Raspberry Pi 1 Model B+ in February 2015. Raspberry pi is a Visa assessed PC .It works practically as a PC. It offers more versatility for students than the less fatty (Pi 1) Model B+, which is more useful for embedded endeavors and assignments which require low force

## 2. Literature survey

Finger Vein Recognition Based Driver Authentication and Alertness System Using GSM [3]. In this paper creator recommended that with the help of biometric system we can get our vehicle. We need to start the engine by crushing their finger in the biometric system. There are two possible results that finger vein match or disregard to organize. If the finger vein is match vehicles start working fittingly. If it fails to coordinate with it alerts the auto owner by sending the message through GSM framework. This structure moreover cautions about the driver alcohol confirmation and lethargy. This system relies upon the Raspberry pi development. [4] Smart Surveillance Monitoring System Using Raspberry PI and PIR Sensor. In this paper creator suggested that sharp perception utilizing to check system is realized Raspberry pi and PIR sensor. There is infrared sensor to recognize the area of number of people in the room. Camera is normally turned on when the area of individual is recognized. By then the information is gotten and sends it to the high level cell phone of affirmed individual through 3G Dongle. [5] The Design of Mobile Control Car Security System. This paper gives the two path correspondence between the approve individual and introduced framework. More significant level of vehicle security highlights is given by this framework. At the point when interruption is recognized this framework will send the admonition message to the vehicle proprietor. When the vehicle proprietor gets the message he has position to control any vehicle include through his advanced cell. This framework is additionally ready to recognize the area of the vehicle by utilizing GSM situating idea. [6] GSM Based Car Security System. In this paper creator recommended that the place of this structure is to endeavor to save the auto considering GSM advancement. At the point when someone endeavors to take your auto it alerts the auto owner with alert and furthermore sends the prepared message to the auto owner through GSM framework. 8. Constant Vehicle Tracking System utilizing GSM and GPS Technology-an Anti-robbery Tracking System. This paper gives the two course correspondence between the endorse individual and presented system. More raised measure of auto security parts is given by this structure. Exactly when interference is perceived this system will send the notification message to the auto owner. At the point when the auto owner gets the message he has ability to control any auto feature through his PDA. This structure is furthermore prepared to recognize the territory of the auto by using GSM arranging thought. [5] Embedded Automobile Engine Locking System, Using GSM Technology. In this paper creator recommended that anyone can keep the burglary of vehicle by using GSM development. This structure is presented in the engine of vehicles with the GSM modem which is moreover connected with the microcontroller. If any individual requirements to start the vehicle then he needs to sort the mysterious word. Right when the mysterious word facilitates at that point and at precisely that point start of the vehicle will start. In case the mysterious key fails to coordinate to the tree preliminaries then structure will begins the alarm and it will send the message to the auto owner through GSM framework

## 3. Proposed system

Due to real-time tracking facility, vehicle tracking systems have become increasingly popular among owners of vehicles as they are able to monitor their vehicle continuously

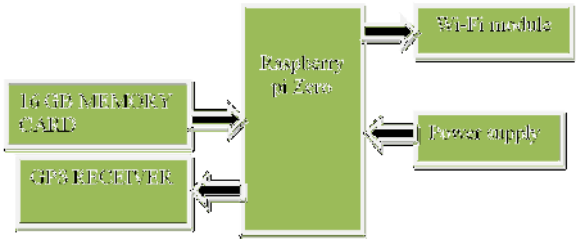


Fig1. Block diagram of proposed system

Figure 1 shows the square outline of Vehicle Tracking System. This task comprises of GPS recipient and Raspberry pi B+ module. The vehicle following equipment is fitted on to the vehicle in such a way that it isn't noticeable to any individual who is inside or outside of the vehicle. Consequently it is utilized as an incognito unit which ceaselessly or by any hinder to the framework, sends the area information to the checking unit. In the opposite end (principle vehicle station) on the cell phone is

connected to the PC with "Blynk" application. So the GPS framework will send the longitudinal and elevation esteems relating to the situation of vehicle to Raspberry pi. At the point when the gadget gets Wi-Fi association, the information get from GPS module. From that point forward, the information ship off the Wi-Fi and it deals with the information. It figures scope and longitude and speed of the close to vehicle. It additionally shows the area of the vehicle on the guide. The primary point of the task is the point at which the vehicle is taken, the area information from global positioning framework can be utilized to discover the area and we can consistently screen the vehicle area from anyplace on the planet.

4. Raspberry pi

Raspberry pi The Broadcom SoC utilized in the Raspberry Pi is comparable to a chip utilized in an old advanced mobile phone (Android or iPhone). While working at 700 MHz as a matter of course, the Raspberry Pi gives a genuine exhibition generally identical to the 0.041 GFLOPS On the CPU level the presentation is like a 300 MHz Pentium II of 1997-1999. The GPU gives 1 Gpixel/s or 1.5 of designs preparing or 24 GFLOPS of universally useful registering execution. The illustrations capacities of the Raspberry Pi are generally identical to the degree of execution of the Xbox of 2001. The Raspberry Pi chip, working at 700 MHz naturally, won't get adequately hot to require a warmth sink or extraordinary cooling. The SoC is stacked under the RAM chip, so just its edge is obvious. On the more established beta model B loads up, 128 MB was dispensed as a matter of course to the GPU, leaving 128 MB for the CPU. On the initial 256 MB discharge model B (and Model A), three unique parts were conceivable. The default split was 192 MB (CPU RAM), which ought to be adequate for independent 1080p video interpreting, or for basic 3D, yet presumably not for both together. 224 MB was for Linux just, with simply a 1080p casing support, and was probably going to come up short for any video or 3D. 128 MB was for substantial 3D, perhaps at the same time with video interpreting (for example XBMC)

Fig2. Raspberry Pi

5. GPS Receiver

A GPS modem is utilized to get the signs and get the signs from the satellites. In this undertaking, GPS modem get the signs from the satellites and those are given to the microcontroller. The signs might be as the directions; these are addressed in type of the scopes, longitudes and heights. Position (longitude, scope) character and temperature to the checking station and to the client/proprietors portable that should assist them with getting clinical assistance if mishap or the robbery. We are proposed to make this observing remote utilizing RASPBERRY PI equipment stage. In this day and age unintentional passings are expanding step by step on the whole most all mishaps the demise caused because of absence of medicines on schedule, due to not getting data to the closest emergency clinics and police headquarters quickly because of the present existing strategy for calling any individual to the clinic and police headquarters

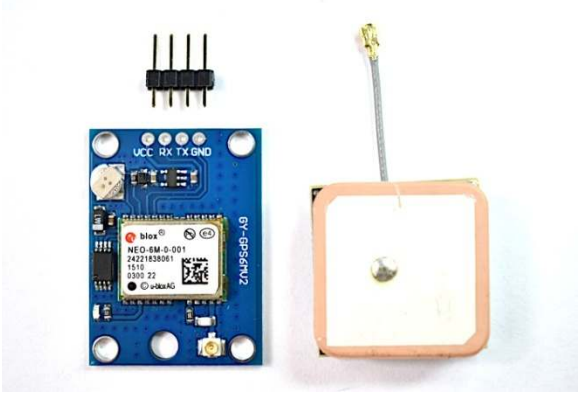


Fig3. GPS Receiver

**5.1 Software setup: Raspbian OS**

The Raspberry Pi primarily uses Linux kernel-based

working frameworks. The ARM11 chip at the core of the Pi depends on variant 6 of the ARM. The current arrivals of a few mainstream variants of Linux, including Ubuntu. won't run on the ARM11. It is preposterous to expect to run Windows on the Raspberry Pi. Raspbian (suggested) – Maintained autonomously of the Foundation; in view of the ARM hard-coast (armhf) Debian 7 'Wheezy' engineering port initially intended for ARMv7 and later processors (with Jazelle RCT/ThumbEE,VFPv3, and NEON SIMD expansions), arranged for the more restricted ARMv6 guidance set of the Raspberry Pi. A base size of 4 GB SD card is required. There is a Pi Store for trading programs. Raspbian is a free working framework dependent on Debian improved for the Raspberry Pi equipment. A working framework is the arrangement of essential projects and utilities that make your Raspberry Pi run. In any case, Raspbian gives in excess of an unadulterated OS: it accompanies more than 35,000 bundles, precompiled programming packaged in a pleasant configuration for simple establishment on your Raspberry PiThe starting form of more than 35,000 Raspbian bundles, enhanced for best execution on the Raspberry Pi, was finished in June of 2012. Nonetheless, Raspbian is as yet under dynamic improvement with an accentuation on improving the security and execution of however many Debian bundles as could be expected under the circumstances

5.2 Python programming

Python writing computer programs is a deciphered, significant level and universally useful programming language. Python's plan reasoning stresses code coherence with its striking utilization of huge space. Its language develops and object-situated methodology intend to assist software engineers with composing, consistent code for little and huge scope projects. Python is powerfully composed and trash gathered. It upholds different programming paradigms,including organized (especially, procedural), object-arranged and useful programming. Python is frequently portrayed as a "batteries included" language because of its thorough standard library. Guido van Rossum started chipping away at Python in the last part of the 1980's, as a replacement to the ABC programming language, and first delivered it in 1991 as Python 0.9.0. Python 2.0 was delivered in 2000 and presented new highlights, for example, list perceptions and a trash assortment framework utilizing reference tallying and was ended with variant 2.7.18 in 2020. Python 3.0 was delivered in 2008 and was a significant update of the language that isn't totally in reverse viable and much Python 2 code doesn't run unmodified on Python 3. Python reliably positions as quite possibly the most mainstream programming dialects

5.3 Blynk application

Web is empowered; like the ESP8266, Raspberry pi with Wi-Fi dongle, molecule photon or Spark Fun Blynk Board. The Blynk App is an all around planned interface developer. It chips away at the two IOS and Android. Blynk is a Platform with Ios and Android applications to control Arduino, Raspberry Pi and the preferences over the Interne. It is a computerized dashboard where a realistic interface can be worked for the undertaking by just moving gadgets. Blynk is a group of experts that can help with the IoT system and its conveyance. Blynk was intended for the web of Things. It can handle equipment distantly, it can show sensor information, it can store information, picture it and do numerous other cool things. There are three significant parts in the stage;

Blynk App: Which permits to make stunning interfaces for the activities utilizing different gadgets we give.

Blynk Server: This is answerable for every one of the correspondences between the advanced mobile phone and equipment. Blynk cloud can be utilized or private Blynk worker is runned locally. It is open source, could without much of a stretch handle a huge number of gadgets and can even be dispatched on a Raspberry Pi. Blynk Libraries for all the well known equipment stages empower correspondence with the worker and interaction every one of the approaching and out coming orders. Equipment utilized An Arduino, Raspberry Pi, or a comparable advancement unit. Blynk works over the web. This implies that the equipment ought to have the option to associate with the web. A portion of the sheets, as Arduino Uno will need and Ethernet or Wi-Fi Shield to convey, others are as of now. Beginning with the Blynk application

6. Experimental arrangement

Vehicle GPS beacon is designed with Raspberry pi and GPS module. The center piece of global positioning framework is Raspberry pi. The geo area of a vehicle can be caught through GPS collector and that information framework will be sent by utilizing Wi-Fi innovation. For checking the area of the vehicle on the guide, a web application has been created. A versatile application (Blynk application) had been created to see the area of vehicle in a cell

phone by utilizing Android Phone. The gadget gets Wi-Fi association, the information ship off the GPS module. From that point onward, the information ship off the Esp8266 and it deals with the information. It computes scope and longitude and speed of the close to vehicle. It additionally shows the area of the vehicle on the guide

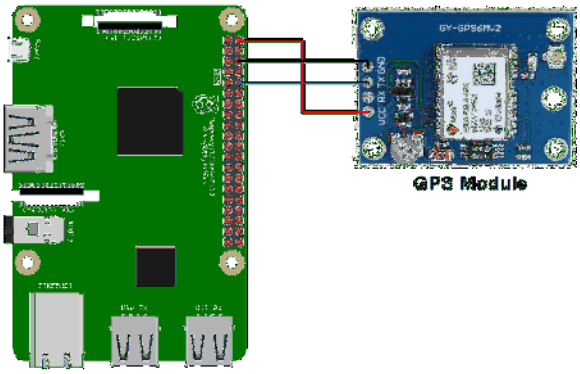


Fig4. Circuit diagram of proposed system

## 7. Result Analysis

We have to connect the kit according to block diagram as shown in fig4. Connect the raspberry pi to Wi-Fi. And then run the program in order to get out put GPS will trace the longitude and latitude values. These values will be sent to that Blynk android application using Wi-Fi. We can monitor vehicle location using Blynk android application as shown in fig5.


Fig5. View of Location on Mobile Blynk Application

## 8. CONCLUSION

In this work "Plan and Implementation of IoT Based Vehicle Monitoring and Tracking System" has been built up that is adaptable, adjustable and exact. This global positioning framework can screen the vehicle's area by means of versatile apk and online on Google map. To show the situation on Google map, Google Map API has been utilized. We considered planning a constant vehicle global positioning framework in our venture remembering the situation of Myanmar where vehicle robbery is quickly expanding. Our gadget can give great control on carjacking. The framework gives exact information progressively that makes it feasible for the client to follow the vehicle and it additionally empower an early recovery if the vehicle is taken. Execution of GPS tracker in vehicle can positively get progressive change agricultural nation like Myanmar where there is high metropolitan just as rustic vehicular progress each day. This paper has generally expanded our insight into GPS and furthermore improved our programming abilities.

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