

Structure And Implementation Of Smart Vehicle Theft Location Using Raspberry Pi And Iot Without A Doubt Time Application

¹Y Harisandana(15NE1A05B6),²N Neelima(15NE1A0572),³M Venkateswararao(15NE1A0563),
⁴Sk Apsara(15NE1A0598).

*Tirumala Engineering College, Jonnalagadda, Narasaraopet, Guntur, Andhra Pradesh.
Harisandana13@gmail.com*

Abstract: The wrongdoing identified with vehicle burglary has been a colossal ascent with criminal's getting to be more astute consistently. This creates a significant requirement for a compelling vehicle robbery finding framework. In this paper, a smaller, shoddy and productive framework is contemplated, planned and investigated utilizing Raspberry Pi as the center preparing unit of the entire framework. Sensors information of Passive Infra-Red (PIR) movement sensor, weight sensor, gas sensor, including Global Positioning System (GPS), Pi camera, ringer and a Liquid Crystal Display (LCD) show are gathered by inserted Linux framework. The gadget capacities in two modes: User mode what's more, Theft mode. The device has capacity of identifying interruption and on identification will ring an alert and send directions to the client's appointed E-mail. The gadget will send the scope and longitudinal subtleties to the client's email alongside the caught picture utilizing remote detecting at whatever point there is an interruption or if the gadget is dislodged after a specific edge as on account of bicycle burglary wherein the total vehicle can be easily dislodged without beginning the motor or deactivating physical locks. It is anything but difficult to find the vehicle and get exact position on Google Maps utilizing this plan. This paper investigates the likelihood of a smaller, flexible, reasonable, shabby and proficient vehicle burglary location framework.

Keywords: Raspberry pi, GPS module, IOT, Pi camera, PIR sensor, Tracking, Embedded.

1. INTRODUCTION

With the ascent in the quantity of vehicles, the robbery identified with it has additionally risen exponentially. Consistently in excess of 10 million vehicles are stolen far and wide and lion's share remain untraced. Culprits are getting to be more brilliant step by step and have achieved the phase of culmination against the current vehicle wellbeing frameworks. Stolen vehicles and bicycles are much of the time utilized in genuine wrongdoings that outcome in property harm, physical wounds and death toll after a mishap. This brings in for a need of a proficient robbery recognition framework. The vehicle following equipment is fitted on to the vehicle. It is fitted in such a way, that it isn't noticeable to any individual who is outside the vehicle. Web of Things (IOT) is the savvy innovation which encourages gadgets to remain associated in the present age. All gadgets can be coupled mutually and used to trade information with remote login clients to make life less difficult as appeared in fig-1. Security assumes a remarkable job in the present developing innovation. Vehicle security has achieved various quick changes yet the security plans cost are high and not middle of the road for all proprietors. An enemy of burglary framework is an equipment or component used to maintain a strategic distance from the unapproved access of somebody's vehicle. In this

paper we are proposing a framework which alarms and tells the proprietor if there should arise an occurrence of any interruption or robbery of the vehicle and furthermore sends the refreshed area of the gadget at ordinary interims, which will be an expansion to the effectively existing handle and wheel locks. Proprietor will be alarmed in regards to robbery endeavor and will be furnished with the co-ordinates of the vehicle utilizing GPS module through an E-mail. Piezoelectric sensor is utilized to recognize any superfluous vibrations caused due to physical altering, gas sensor to recognize any flame admonitions and a PIR movement sensor is utilized to identify interruption. Wi-Fi dongle is utilized for getting to the web. Python scripting is utilized for programming the board as it is perfect with Pi. After the vehicle has been left, it will be changed to 'robbery' mode and if an interloper endeavors to uproot the vehicle over certain limit, the alert begins ringing and a picture with the separate GPS co-ordinate is sent to the client. The GPS co-ordinates, date and time can be unequivocally put away in a database and further client can recover the information utilizing page. We are tending towards Raspberry pi since it's shabby, smaller, amazing and the accessibility of apparatuses for better support. This gives an edge over different bits of innovation for the same reason.

2. LITERATURE SURVEY

Mechanical gadgets have the detriment of being obliterated easily utilizing other mechanical apparatuses. We have considered the ongoing substitute frameworks on robbery recognition utilizing picture handling innovation which catches the picture of the driver and contrasts and the spared picture of proprietor to distinguish an interruption however have a lot of downsides and imperfections, and unique mark location which appears to be awkward and over the top expensive to actualize on bikes. The current frameworks likewise possess more territory which is one of the real requirements for bikes. Hoodlums and crooks have conceived methods to counter the current frameworks. The request is to structure a framework taking size, cost and power as requirements. In [1], the paper displays target of armada observing and the executives. The framework has two units: the primary is the security unit comprising of a GSM, GPS, hand-off, current sensor and microcontroller. The present sensor will transmit a simple flag to the controller at whatever point the vehicle is moving and affirmation is done by sending SMS to the proprietor. In [2], the structure recognizes the message and through CAN Bus communicates the message to the entire vehicle arrange. The precise area will be send to the proprietor inside less time. The GSM modem interfaced to the microcontroller gets the message, the yield of which orders a part that disables the start of the vehicle by utilizing stream sensor which brings about halting of the vehicle. In [3], the creator delineated a framework to alarm the client if the unapproved individual attempts to remove the vehicle and stop the start and deactivate the device. In [4], creator proposed a vehicle security framework required with a GPS and a GSM module. The client interfaces through this substructure with

vehicles and chooses their present zones and status utilizing Google Earth and the situation of alarmed vehicles can be trailed by customer. In [5], engines of vehicles are controlled utilizing GSM and microcontroller. The mystery word which has been announced should be dealt with for the vehicle to begin. Exactly when the mystery word organizes at that point and at precisely that point start of the vehicle will start. Each time mystery key fails to coordinate up to the three preliminaries then structure will begins the alarm and it will send the message to the proprietor through GSM framework.

3. WORKING AND OPERATION

The Raspberry Pi is a 32-bit Visa estimated single-board PC utilizing Broadcom BCM 2837 System on Chip (SoC), containing a quad center ARM cortex-A53 running at 1.2GHz and a videocore4 GPU as appeared in fig-2. It doesn't accompany an ongoing clock (RTC), so an OS must utilize a system time server. In any case, a RTC with battery fueled can be included by means of the I²C interface. The control supply is from the USB center point which yields 5v, 2A dc. The Ethernet link is associated with the Pi and the Laptop to give the have server. The OS utilized is Raspbian Squeeze and the program is written in Python IDE. Likewise, a 16 GB bootable SD card with Linux is mounted to the Pi Board for capacity. There is additionally a worked in Wi-Fi for the board yet for outside applications, however an outside USB Wi-Fi dongle can be incorporated for the web network. The camera module v2 interfaces with CSI-2 camera port and devours 250mA of intensity from the board utilizing a short strip link. The camera information is handled and at last changed over to a picture on the SD card. The camera is of 5 megapixels and we have utilized 720p goals so it devours less measure of capacity.

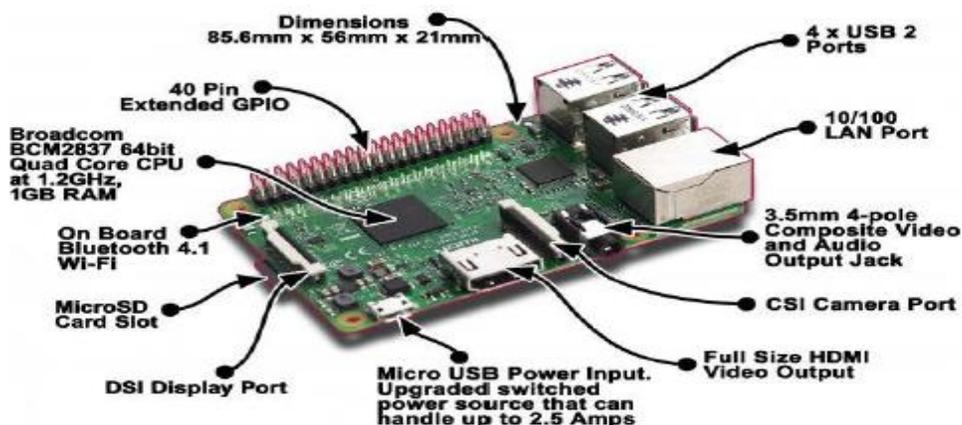


Fig.1 Raspberry Pi 3 model v2.2

The pictures are put away in .jpeg format. A Neo-6m GPS module is satellite route framework that gives position and time data in every single climate condition. The GPS recipient gives yield in NMEA group (- 157dBm). The recorded area information can be spared inside the following unit and can be sent to enlisted email upon identification of burglary. There are three sensors incorporated with the

structure. The PIR gets a HIGH flag at whatever point movement is identified by the PIR module. Alongside PIR, different sensors, for example, weight sensor to distinguish the vibration over certain edge and MQ-2 gas sensor for disturbing if fire turns up around the vehicle. A ringer is likewise interfaced for caution purposes.

A. Proposed System

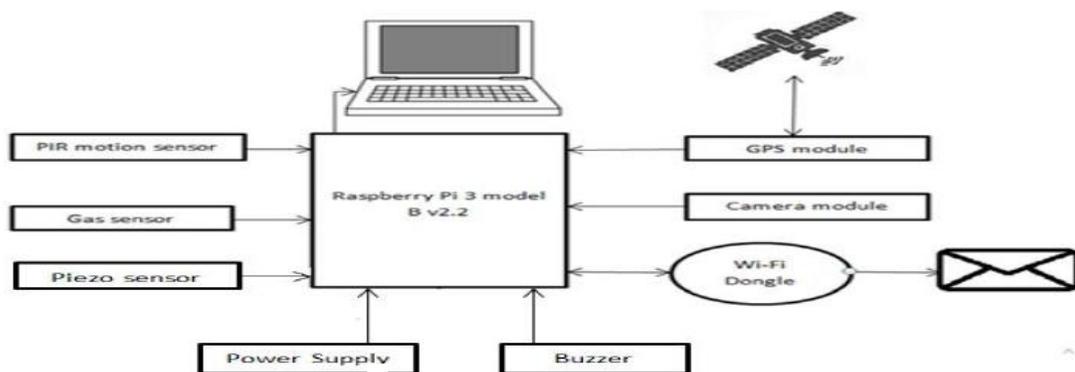


Fig Proposed block diagram.

B. . Algorithm

- 1) Initially the system will be working on user mode.
- 2) After the vehicle is parked, theft mode can be turned on using a switch.
- 3) PIR, pressure and gas sensors will continuously monitor any burglaries.
- 4) If output on those pins is HIGH, the camera module captures the image instantaneously.
- 5) GPS module tracks latitude, longitude, and date and time co-ordinates of the system.

- 6) If the vehicle is displaced by 120metres, then also the GPS module saves the revised co-ordinates of the System.
- 7) Camera image along with a link to respective spot are sent to the user via registered E-mail.
- 8) The authorized user can view the image and open the Google Maps to track the vehicle.
- 9) Once the user reaches to the vehicle, user mode can again be turned on.

C. Testing and Simulation

The segments, for example, Pi camera, GPS module, PIR movement sensor, Gas sensor, and bell

were interfaced with Raspberry Pi 3 board utilizing USB link and Ethernet LAN link as appeared in fig.4.

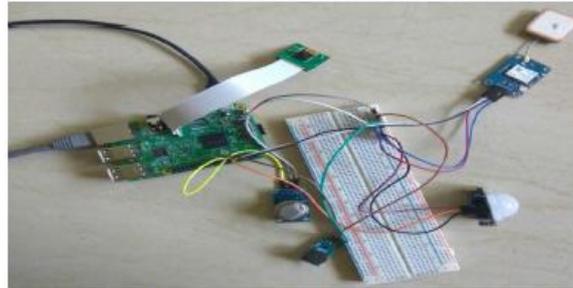


Fig.4 System Implementaion

After the fruitful execution of the above thought, at whatever point there is an interruption with the vehicle or flame around the vehicle, the signal began blaring and the co-ordinates were seen at pi terminal alongside robbery identified message. Notwithstanding it, a mail was sent to the client with the picture and a connection to Google Maps to follow the position. This project is designed using a Raspberry PI single board computer used for embedded application. The Interfacing components used are PI camera, GSM & GPS Modem, Door Sensors, Proximity Sensors, Wi-Fi Dongle as shown in Fig-2. USB mouse and key board can be used for user-friendly usage of the Board. The 32 bit ARM controller on the Raspberry Device supports the Functionality as the CPU Core [2]. Android Application is designed using eclipse software to support the locking/unlocking feature using SMS threading technique. This app can be installed on any Latest Android Smart phones. The user has to login using the authenticated username and password to access the application. Application is designed to generate Voice commands to intimate user regarding

the activity on the vehicle by detecting the Received SMS. GPS Modem Questar G702-001UB compact all-in-one is used for tracking [3]. The Driver is notified through the APP that the vehicle has been stolen/mishandled and the driver can activate the Tracking system which will enable the camera and start tracing the GPS location. The user can select whether he needs the Internal or External Image captured and saved over the device. This can be done by rotating the camera behind the rear view mirror of the CAR. The Mailing System utilizes the Hotspot Connection and Populates a mail to the users mail ID or the CIS (Centralized Image Server) mail ID stored in the Vehicles Interface at specified periodic interval. The Modem continuously received the signal from the satellites in View and provides accurate positioning data; the modem is ported to the Device using a Renesas processor to avoid overflowing of continuous data frames. Hence, both GSM and GPS are ported onto Single Serial Port of the Device. Data selection is done through a Switching Relay [4].

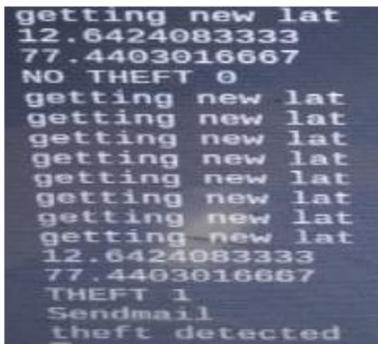
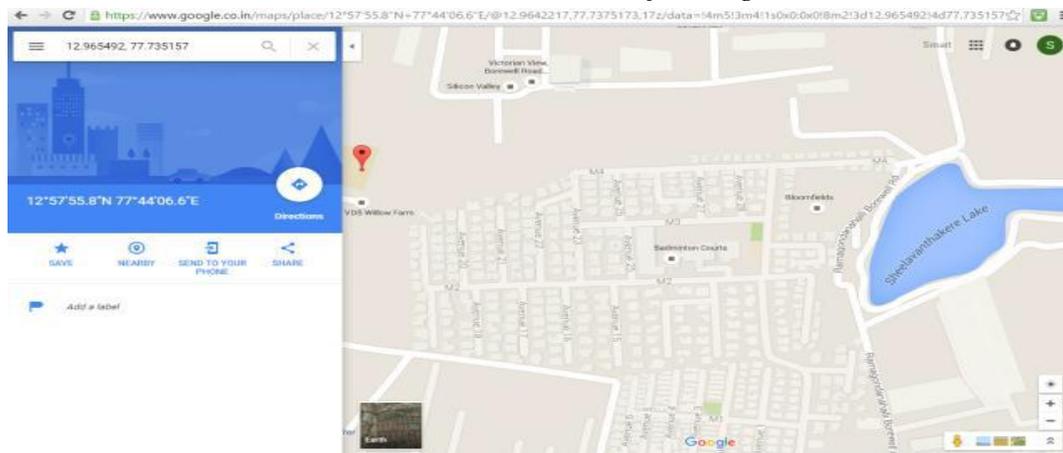


Fig.5: Simualtion and Results

D. GPS Location Traced on Google maps



At first, the motor will be ON by the control supply of the smaller scale controller, which implies that the motor is running in client mode and needn't bother with any assurance. After the client has left the vehicle, the robbery mode can be instantiated. In the event that a gatecrasher endeavors to begin the vehicle for example in the event that any undesirable vibration more noteworthy than a limit esteem is distinguished or the vehicle is separated to a range more prominent than the ideal esteem ,a ringer begins to ring by detecting action utilizing a piezoelectric sensor and an email is sent to the proprietor expressing that a break-in has happened. The client would then be able to make moment move by either illuminating the close-by police headquarters or utilizing some control capacities like immobilizing the vehicle from remote separation.

4. CONCLUSIONS

We got the opportunity to gain proficiency with a great deal about framework usage, part interfacing on the board and effective, smaller programming. Vehicle burglary identification gadget is the need of great importance and a reduced, productive and modest gadget can be made utilizing Raspberry pi. A amazing item can in the end be made out of this framework. We can improve the precision by expanding the expense of the parts. We can include rescue vehicle contact numbers and police headquarters contact number with the goal that they can connect exceptionally quick to that area. The application can be made equipped for creating the voice based alarm to the client. Additionally, the highlights to hinder the start unit by sending a few directions to the microcontroller can be added make the vehicle difficult to begin for improved security. The whole framework can be incorporated with an android application and the significant information

can be put away in a database so it may all the more effectively be available to the client.

REFERENCES

- [1] Montaser N. Ramadan, Mohammad A. Al-Khedher, Sharaf A. Al-Kheder, "Intelligent Anti-Theft and Tracking System for Automobiles" IJMLC, Vol. 2, No. 1, February 2012
- [2] Karan Siyal and G. Gugapriya," Anti-Theft Vehicle Locking System using CAN" IJST, Vol.9, December 2016
- [3] Pengfei Zhou, Yuanqing Zheng, Mo Li, "How Long to Wait? Predicting Bus Arrival Time with Mobile Phone Based Participatory Sensing," Mobile Computing, IEEE Transactions on, vol.13, no.6, pp.1228, 1241, June 2014
- [4] D. Jiang, V. Taliwal, A. Meier, and W. Holfelder, "Design of 5.9 GHz DSRC-Based Vehicular Safety Communication," IEEE Wireless Communications Magazine, October 2006
- [5] B.G. Nagaraja, Ravi Rayappa, M. Mahesh, Chandrasekhar M. Patil, Dr. T.C. Manjunath, "Design & Development of a GSM Based Vehicle Theft Control System" 978-0-7695- 3516-6/08©2008 IEEE, DOI 10.1109/ICACC.2009.154, pp.148-152
- [6] Hui Song, et.al, " SVATS: A sensor-network-based Vehicle Anti-Theft System", IEEE INFOCOM 2008 proceedings, IEEE INFOCOM 2008 Proceedings, pp 171-175, 2008
- [7] Liu Anqi Zhang, Shaojun Li, "Vehicle anti-theft tracking system based on Internet of things," Vehicular Electronics and Safety (ICVES), July 2013

- [8] J. Zhao and G. Cao, "VADD: Vehicle-Assisted Data Delivery in Vehicular Ad Hoc Networks," IEEE INFOCOM, April 2006
- [9] Le-Tien and Thuong, "Routing and tracking system for mobile vehicles in large area", Electronic Design, Test and Application, 2010, DELTA '10, Fifth IEEE International Symposium, pp. 297 – 300