

Smart Vehicle Tracking System using RFID

Ragipati Karthik, T. Harshavardhan, M. Vinod Reddy



Abstract: A proficient vehicle tracking framework is projected and executed for the development of any vehicle following from any area at any time. The proposed arrangement takes points of interest of the two fundamental highlights in portable stage these days which are area administrations, predominantly GPS-GSM based, and essential communication administrations, principally SMS based. The utilization of RFID per user is to peruse the tag of a vehicle and the data will be sent to the framework, the highlights incorporate controlling the framework through UI. The contributions from RFID per users are persistently refreshed To Arduino for handling the information. The server gadget's primary duty is to give the careful area of the transport to the server, or the client if there should be an occurrence of SMS based inquiry from customer's gadget. Then again, customer's gadget can discover transport area either utilizing SMS administration or utilizing network access. If customer uses android mobile, user can introduce the application to follow the transport area utilizing web access. The server gadget will be put on the vehicle of enthusiasm with our application introduced inside it. It performs preferred from numerous points of view over other comparative vehicles following frameworks. The proposed framework utilized a prevalent innovation that joins a Smartphone application.

Keywords: GPS and GSM Module, RFID TAG, Smartphone Application, Vehicle Tracking.

I. INTRODUCTION

Vehicle following frameworks joins the utilization of programmed vehicle region in singular vehicles with programming that assembles this armada information for a thorough picture of vehicle areas. Related works were once in the past done yet there is a reality of significant expense and there is greater intricacy. Vehicle data can be viewed on google maps through web concentrated programming.

The RFID (Radio Frequency Identification) requires the cooperation of a RFID per user and an RFID tag. An RFID tag is an article that can be applied into an item with the end goal of ID and following.

Revised Manuscript Received on January 30, 2020.

* Correspondence Author

Ragipati Karthik*, Assistant Professor, Department of Electronics and Computer Engineering, Koneru Lakshmaiah Education Foundation, Vaddeswaram, AP, India. Email: karthik12625@gmail.com

T. Harshavardhan, B. Tech, Department of Electronics and Computer Engineering, Koneru Lakshmaiah Education Foundation, Vaddeswaram, AP, India. Email: harshavardhantagalapu3@gmail.com

M.Vinod Reddy, B. Tech, Department of Electronics and Computer Engineering, Koneru Lakshmaiah Education Foundation, Vaddeswaram, AP, India. Email: madireddyvinod.93@gmail.com

© The Authors. Published by Blue Eyes Intelligence Engineering and Sciences Publication (BEIESP). This is an [open access](https://creativecommons.org/licenses/by-nc-nd/4.0/) article under the CC-BY-NC-ND license <http://creativecommons.org/licenses/by-nc-nd/4.0/>

This should be possible by utilizing radio waves. A few labels can be perused from a few meters away and past the observable pathway of the per user. An RFID tag is an article that can be fused into an item. The main task is fixing the RFID technology for the accurate movement of the vehicle. This task manages Arduino which fills in as the focal controller acting like cerebrum of the framework. Individuals on along run sit tight for the transports at the bus station. Since they can't get the area of the transport, they get the chance to take some different methods of transport to arrive at their goal. To demolish the manual log passage and to computerize the procedure this task assumes an indispensable job. Mobiles telephones are picked as the medium to speak with the travelers that give simple access to them. In this paper the task centre is to follow the transports, sending SMS to the approved people, refreshing the travelers through notices and improving the openness to the framework [1]. The featured highlights of this venture build the enthusiasm of the travelers in taking open method of transportation.

The essential motivation behind a vehicle following framework is to follow the objective vehicle or different articles. The GPS beacon can transfer the data of the current location of the vehicle and its speed, and so forth. Most of such following frameworks comprises of an electronic gadget as for the most part introduced in buses and can be utilized for following engines, transports [2],[3].

II. SYSTEM BLOCK DIAGRAM

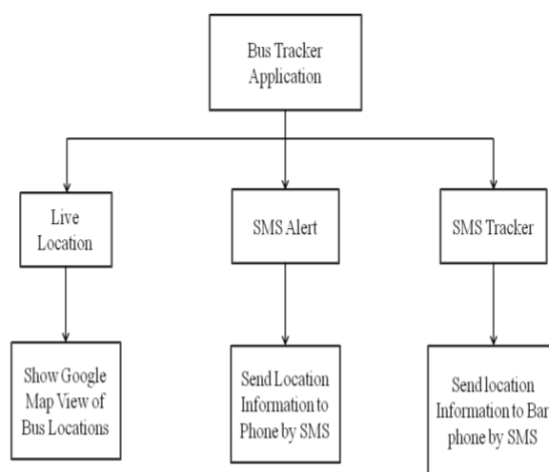


Fig. 1. Block Diagram of Methodology

A. Android Application

Figure 1 shows the system block diagram. The proposed android application comprises of two modules.

Smart Vehicle Tracking System using RFID

The first module will be introduced into that android mobile phone which will be in transport. This module will fill in as the server module. It will occasionally discover the GPS co-ordinates of the transport by utilizing area locations of the android mobile phone that is GPS collector of that mobile phone.

The module additionally incorporates a message alert administration. The second module is the application which will be introduced into the customer's mobile phone. It has three sub-modules. The initial one is a live location. It will show the area of specific transport alongside its recorded time on the Map. The second one is the message alert. It will give area data to the customer's mobile phone as a message. The third one is message tracker for getting the location without the help any web association or Android mobile phone [4].

B. GPS and GSM Module

A GSM modem is a wireless modem that operates on a GSM wireless network. A wireless modem functions like a dial-up modem. The main difference is that dial-up modems send and receive data over fixed telephone lines, whereas wireless modems send and receive data over radio waves. The GSM modem can be an external device or a PCMCIA card / PC card. Often the GSM modem is connected to a computer via a serial or USB cable. The GSM modem with PCMCIA card / card is designed for use with laptops. It must be inserted into the PCMCIA card / PC card (Figure 2). In order to use the GSM modem, you must have a SIM card with a wireless service provider, such as a GSM phone. GSM modems are a wireless modem for GSM wireless networks [5].



Fig. 2. GPS and GSM module

GSM specifications define the interface requirements and the functions only. This is because operators can purchase equipment from a variety of suppliers, although the designers are limited [6]. The GSM network consists of the switching system, the base station system, and the operating and support system.

C. RFID

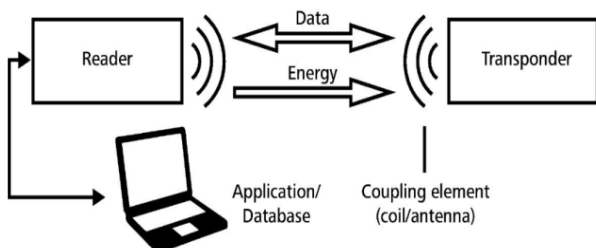


Fig. 3. RFID reader

RFID is radio recurrence ID, and thusly, RFID labels use radio recurrence innovation. Figure 3 shows the smart RFID reader. These radio waves transmit information from the tag to a user, which at that point transmits the data to an RFID PC program. RFID labels are as often as possible utilized for the stock, yet they can likewise be utilized to follow vehicles [7].

D. Arduino

The Arduino Uno board consists of Microchip ATmega328P microcontroller. Table-I shows the features of the Arduino board.

Table- I: Arduino board features

Items	Features/Ratings
Microcontroller	ATmega328
Operating Voltage	5V
InputVoltage (recommended)	7-12V
Input Voltage (limits)	6 – 20V
Digital I/O pins	14 (6 provide PWM output)
Analog Input pins	6
DC current per I/O pin	40mA
DC current for 3.3V pin	50mA
Clock Speed	16MHz
Flash Memory	32Kbits
SRAM	2Kbits

III. FRAMEWORK DEVELOPMENT

The circuit board comprises of the gadgets which are to be controlled are associated with the circuit board. A basic page is structured utilizing Arduino. It is mentioned by the customer to the server. At that point, the web forms these solicitation and server reaction for customer demand with the website page. The Client can know the status of the sensors and can control the gadgets, for example, engines that are associated with a hand-off through its program from a remote area. The status of the sensors and burden cell are appeared on the site page by composing the IP address of the server board. Thus, the customer can get to the entire business from any remote spot employing its nearby program.

This test plans to check if the vehicle entering and leaving the entryway are enrolled in the framework. Whenever enlisted, the green light will be lit, and the entryway will open, and the bell will make sound. The camera at that point catches the picture [8]. In this test, the framework should effectively check the enrolled RFID to have the framework play out the normal activity. Steps here incorporate the perusing of RFID card, distinguishing the vehicle through the ultrasonic sensor, at that point expected activity must be finished as per the status of the vehicle [9].

IV. FLOW CHART

The framework begins when the transport is detected by the RFID per user. Figure 4 shows the flowchart of the system.

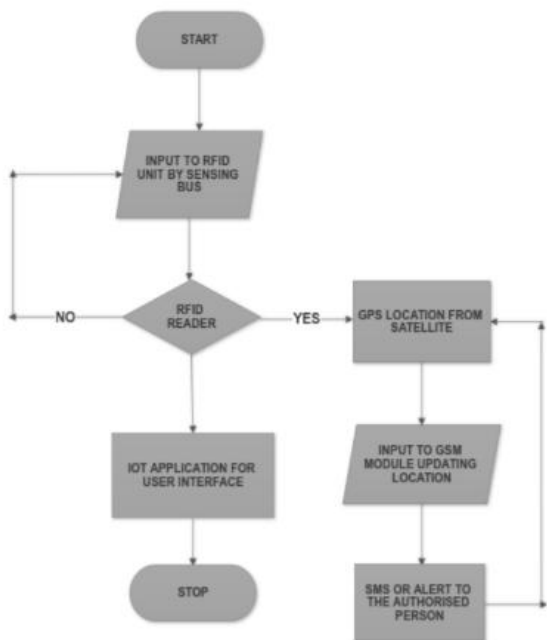


Fig. 4. System Flowchart

V. SYSTEM DEVELOPMENT

If the RFID per user yield is valid, at that point the GPS area is mentioned from the satellite and the information is given to the GSM module for refreshing the framework through the handling unit. Figure 5 shows the hardware development of the system.

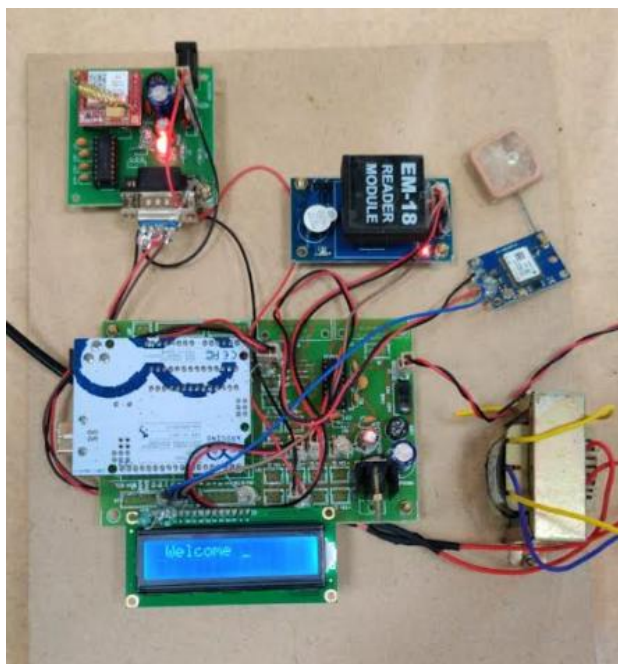


Fig. 5. System Development

VI. EXPERIMENTAL RESULTS

The GPS is sending the coordinates to the arduino board and the board in turn will be reading the obtained coordinates and extract the character of the coordinates. The required string will then be matched. The coordinates reading time, latitude and longitude are obtained (Figure 6). Once the string is matched, then the string is stored in a temporary array. After storing, these arrays are sent to user's mobile phone via SMS using the GSM module (Figure 7). SMS will be sent for each transport being followed. On the off chance that the RFID per user yield is bogus, at that point the per user holds up until its yield turns out to be valid. The following stage is giving the data to the client through IoT. The data to the client appears as warnings. This stream proceeds for each transport being followed [10].

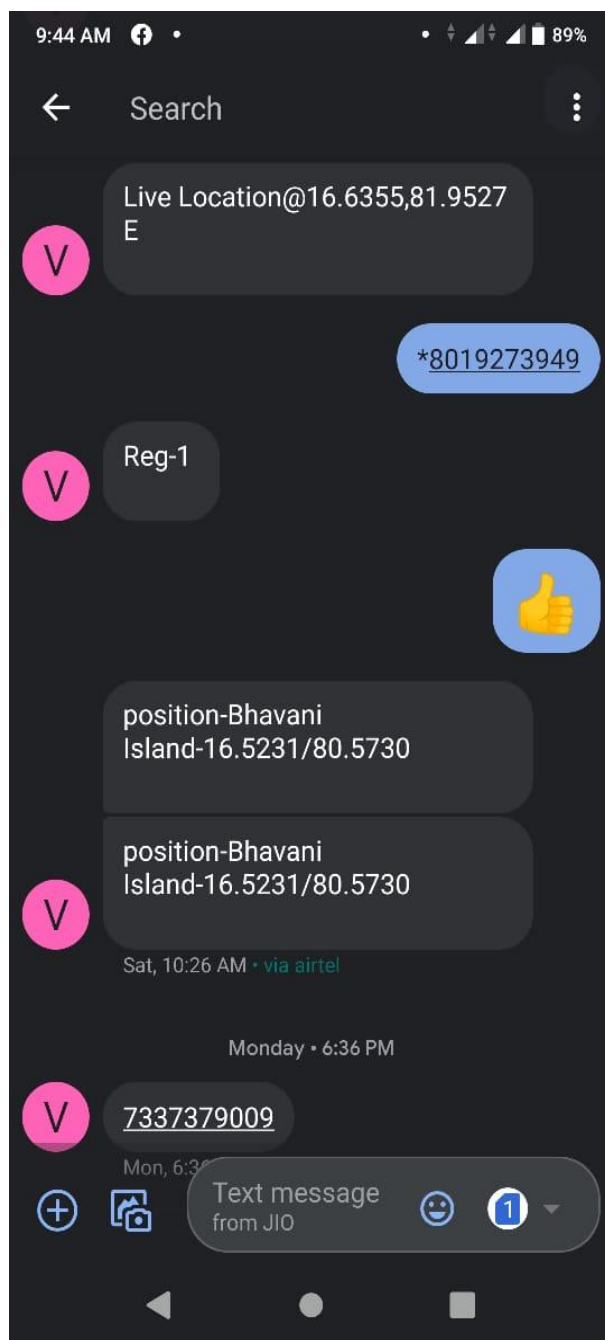


Fig. 6. Live location and position coordinates

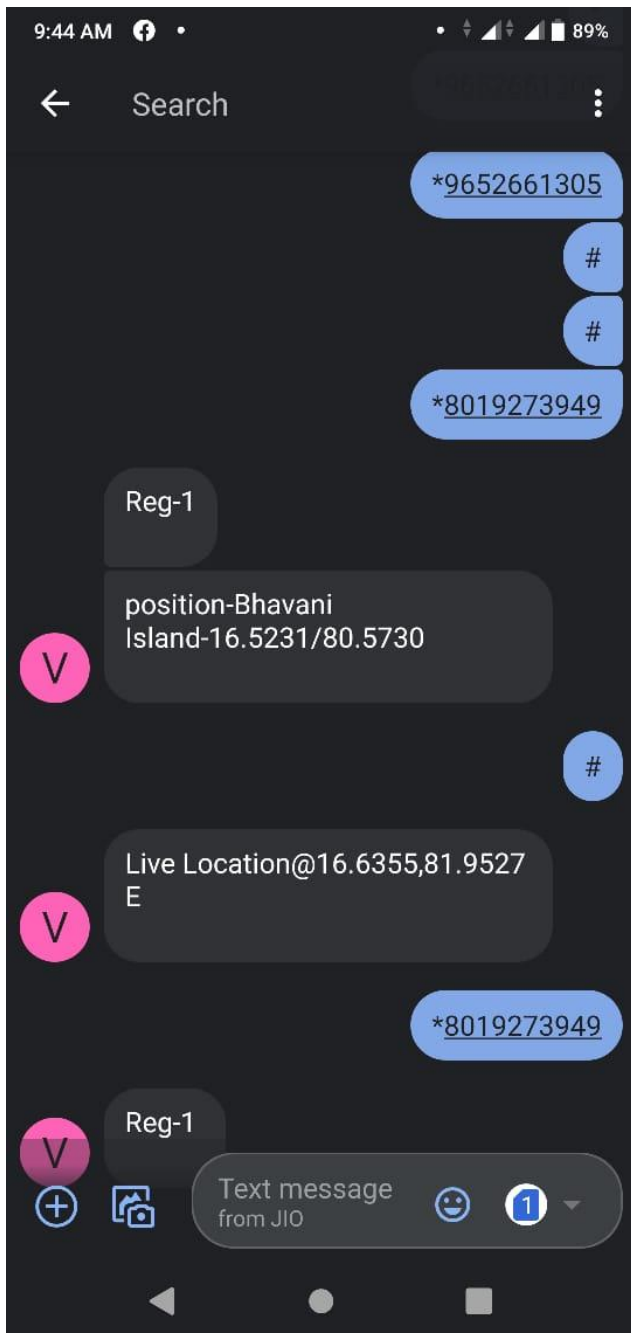


Fig. 7. Vehicle Tracking using GSM

VII. CONCLUSION

Planned as a framework, the purpose is to robotize the on-street vehicle checking by the police officers. For which we are presenting another idea that each vehicle ought to have RF Device fitted with the vehicle. By supplanting the on-street checking the RF Reading gadget put close by the street will peruse the card subtleties, and naturally approves the proprietor subtleties and relating testament subtleties. If any befuddle found the framework will consequently send alarms to the office. Lost vehicle discovery or potentially vehicle theft following. The proprietor and police officers can see the vehicle position that is the vehicle is under which station limit. So, it will be a lot simpler to discover the vehicle.

REFERENCES

1. N.M. Morshed, "Microcontroller based home automation system using Bluetooth, GSM, Wi-Fi and DTMF," 2015 International Conference on Advances in Electrical Engineering (ICAEE), Dhaka, 2015, pp.101-104.
2. M. Trinath Basu, Ragipati Karthik, J. Mahitha, V. Lokesh Reddy, "IoT based forest fire detection system," International Journal of Engineering & Technology, Vol 7 No 2.7, 2018, pp. 124-126.
3. Bellamkonda Jyothi, Dronamraju Sruthi, Ragipati Karthik, "Energy Monitoring Using Arm 7," International Journal of Innovative Technology and Exploring Engineering (IJITEE), Volume-8 Issue-6, April 2019, pp. 441-445.
4. Saranyakumar Chigurupati, Ravi Teja Vallamsetti, Yogesh Misra, Ragipati Karthik, "Intelligent vehicle pollution monitoring using IoT," International Journal of Engineering & Technology, Vol 7 No 2.7, 2018, pp. 376-378.
5. Michael Preetam Raj P, Tirupathi R, Krishna P.G, Sateesh J, Balachander V.K, "Designing a multi-purpose GSM based interactive embedded data acquisition system providing solutions for fire accidents," International Journal of Electrical and Computer Engineering, 6(4), 2016, pp. 1506-1513
6. Neeli R, Dabbakuti J.R.K.K, Rajesh Chowdhary V, Tripathi N.K, Devanaboyina V.R, "Modeling of local ionospheric time varying characteristics based on singular value decomposition over low-latitude GPS stations," Astrophysics and Space Science, 2018, 363(9), pp. 182
7. Satyanarayana P, Sai Prajwal K, Chandra Naga Varma, T, Sri Manojna E, Sitara S, "Advanced motion tracking based mobility assistance for physically disabled," ARPN Journal of Engineering and Applied Sciences, 2016, 11(15), pp. 9545-9552.
8. Krishnaveni K, Venkata Ratnam K, Prathyusha G, Gopi Krishna P, "Development of real time environment monitoring system using with MSP430," International Journal of Engineering and Technology (UAE), 2018, 7(2), pp. 72-76.
9. Satya Narayana P, Syam Kumar M.N.V.S, Keerthi Kishan A, Suraj K.V.R.K., "Design approach for wideband FM receiver using RTL-SDR and raspberry PI," International Journal of Engineering and Technology (UAE), 2018, 7(2), pp. 9-12.
10. Sujitha M.V.S, Ramesh N.V.K, Kotamraju, S.K, "Automatic speed controlling of vehicle and detection and notification of potholes and humps," Journal of Engineering and Applied Sciences, 2016, 11(9), pp. 1921-1924.

AUTHORS PROFILE



Ragipati Karthik, Currently working as Assistant Professor in the Department of Electronics and Computer Engineering (ECM), Koneru Lakshmaiah Education Foundation, Vaddeswaram, Andhra Pradesh, India. Received his Masters degree (M. Tech) from SRM University, Chennai, Tamil Nadu, India in the specialization Embedded Systems Technology, Received Bachelors degree (B. Tech) from College of Engineering, Attingal, Thiruvananthapuram, Kerala, India. He has nearly 7.5 years experience and has published papers in reputed scopus indexed international journals and conferences. His area of interests are IoT, Embedded Systems and Wireless Sensor Networks.



T. Harshavardhan, Currently pursuing B. Tech (IV/IV) in the Department of Electronics and Computer Engineering (ECM), Koneru Lakshmaiah Education Foundation, Vaddeswaram, Andhra Pradesh, India. His area of interests are IoT and Embedded Systems.



M. Vinod Reddy, Currently pursuing B. Tech (IV/IV) in the Department of Electronics and Computer Engineering (ECM), Koneru Lakshmaiah Education Foundation, Vaddeswaram, Andhra Pradesh, India. His area of interests are IoT and Embedded Systems.