

Vehicle Tracking and Accident Reporting System

B Kedarnath, B Ramanuja Charya, Y V Avinash

Abstract: A minimal effort Global Positioning System (GPS) beneficiary has generally been utilized for traditional applications to track the vehicle location with respect to the co-ordinates such as Latitude and Longitude with a direction having reliable and continuous information provision as well. The main objective is to make a controllable framework that can show the area of a vehicle utilizing Global situating framework (GPS) to stick point the area and General Packet Radio Service (GPRS) as a mean for speaking without any difficulty of finding after mishap occurs. The current framework is made either for mishap announcing or vehicle following at whatever point mentioned the data can be sent by means of Short Message Service (SMS). In this paper both GPRS and GPS modules are used along with Accelerometer Sensor (for vibration detection), IR Tx-Rx (to detect whether an object is coming closure to our vehicle) and Temperature sensor (to monitor engine heat). The proposed design used in real time applications undergoes by uploading the information regarding position of the vehicle into the web page and accident detection will be sent via SMS to the respective mobile number. The performance of the proposed design is analyzed and explored over ARMLPC2148.

Keywords: ARMLPC2148, GPRS, GPS, Accelerometer Sensor.

I. INTRODUCTION

Progressively, installed frameworks engineers and framework on-chip fashioners select explicit microchip centres and a group of instruments, libraries, and off-the-rack parts to rapidly grow new microchip-based items and applications. ARM is one of the significant alternatives accessible for the installed framework designer. In the course of the most recent couple of years, ARM engineering has become the most unavoidable 32-piece design on the planet, with a wide scope of ICs accessible from different IC makers. ARM processors are installed in items going from cell/cell phones to car stopping mechanisms. An overall network of ARM accomplices and outsider sellers has created among semiconductor and item configuration organizations, including equipment engineers, framework architects, and programming designers. ARM7 is one of the generally utilized miniaturized scale controller families in the implanted framework applications. ARM is a group of guidance set structures for PC processors dependent on a RISC engineering created by British organization ARM Holdings. A RISC-based PC configuration approach implies ARM processors require essentially fewer transistors than run of the mill processors on normal PCs.

This methodology lessens costs, warmth and force use. These are alluring qualities for light, convenient, battery-controlled gadgets—including cell phones, PCs, tablets, and notebook PCs), and other inserted frameworks. A less complex structure encourages progressively effective multi-centre CPUs and higher centre tallies at a lower cost, giving higher handling power and improved vitality effectiveness for servers and supercomputers. In 2005, about 98% of every cell phone sold utilized in any event one ARM processor. The low force utilization of ARM processors has made them exceptionally well known: 37 billion ARM processors have been created starting in 2013, up from 10 billion of every 2008. The ARM engineering (32-bit) is the most generally utilized design in cell phones, and most well-known 32-bit one is installed frameworks. As indicated by ARM Holdings, in 2010 alone, makers of chips dependent on ARM structures detailed shipments of 6.1 billion ARM-Based processors, speaking to 95% of cell phones, 35% of advanced TVs and set-top boxes and 10% of portable PCs. It is the most broadly utilized 32-piece guidance set engineering as far as the amount delivered. LPC2148 is the broadly utilized IC from the ARM-7 family. It is fabricated by Philips and it is pre-stacked with numerous inbuilt peripherals making it progressively productive and a dependable alternative for the apprentices just as a very good quality application engineer. The wide assortments of sensors utilized for the advancement of this proposed framework are Accelerometer sensor (for vibrations), LM35 (for observing motor warmth), IR Tx-Rx (for showing objects are coming nearer to the vehicle) and the modules GPS (for vehicle position) and GPRS (to sent SMS when a mishap occurs). General Packet Radio Service is a parcel exchanging innovation that empowers information moves through cell systems. It is utilized for versatile web, MMS and other information correspondences. In principle, the speed furthest reaches of GPRS is 115 kbps, however, in many systems, it is around 35 kbps. Casually, GPRS is additionally called 2.5G. GPRS module is a breakout board and a base arrangement of the SIM900A Dual-band GSM/GPRS module. It can speak with controllers by means of AT orders. This module bolsters programming power on and reset. The Global Positioning System (GPS) is a space-based satellite route framework that gives area and time data in every single climate condition, anyplace on or close to the earth where there is an unhindered view to at least four GPS satellites. Already, numerous works are done on this application with an alternate sort of venture that appeared around then. In any case, because of progression in the advancements that for the most part centre around the unwavering quality and execution of different structures. The effective utilization of vehicle guides utilizing a Mixture Particle Filter for Inertial Sensors or Odometer or Map Data or GPS mix was portrayed by Jacques Georgy et al. [1] To follow the vehicle area utilizing.

Manuscript received on 03 February 2021 | Revised Manuscript received on 19 February 2021 | Manuscript Accepted on 15 March 2021 | Manuscript published on 30 March 2021.

* Correspondence Author

B Kedarnath, Computer Science and Engineering in SRM Institute of Science and Technology located in Chennai, Tamil Nadu, India.

B Ramanuja Charya, Computer Science and Engineering in SRM Institute of Science and Technology located in Chennai, Tamil Nadu, India.

Y V Avinash, Computer Science and Engineering in SRM Institute of Science and Technology located in Chennai, Tamil Nadu, India.

© The Authors. Published by Lattice Science Publication (LSP). This is an open access article under the CC-BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>)

Vehicle Tracking and Accident Reporting System

Global Positioning System and Global System for Mobile Phone was upgraded by M.F. Saaid.et.al and M.A.Kamaludin.et.al.[2]

The progression in double jump Vehicle to Vehicle Co-employable Communications by Yusing Choi.et.al and Dongwoo Kim.et.al.[3] The improvement of an on-request minimal effort situating and following in enormous conditions by Jaun I. Godino-Llorente.et.al.[4] A compelling traffic reconnaissance framework for identifying and following moving vehicles in evening time traffic scenes was examined by Yen-Lin Chen.et.al.[5] The proposition of Inter vehicle Communication Assisted Localisation was recommended by Nabil Mohamed Drawil.et.al.[6] The constant estimation of street incline dependent on coordinating installed sensor with GPS done by Kichun Jo.e.t.al.[7] To forestall a sidelong crash by structuring a notice module for sporadic vehicle conduct was depicted by Tang-Hsien.et.al and Chieh wang.et.al.[8] Developing a cell phone application to follow the vehicle utilizing GPS and GPRS innovation was upgraded by SeokJu Lee.et.al. what's more, Girma Tewolde.et.al.[9] An ARM-based traffic discovery framework was structured by Li Xue and Ye Qing.et.al.[10] In this paper, the location of a vehicle is traced with the help of GPS module and that information is uploaded to the web page. Simultaneously it checks for accident detection with the help of IR Tx-Rx, Accelerometer Sensor and Temperature Sensor. Whenever accident happens it sends a SMS to the respective number through GPRS module. The paper organisation done as: the methodology to design this model is described in Section II i.e. it gives a brief description about the block diagram and working of this model is explained in a flowchart. The outcome or the results of this design is shown in Section III. The further extension of this design is described in few lines in section IV, and finally the conclusion made in section V.

II.METHODOLOGY

The design proposed in this model uses ARM7 LPC2148, IR Tx-RX, an Accelerometer Sensor, Temperature Sensor, GPRS, GPS modules and finally the data from GPS is uploaded into a webpage. The methodology of this design can be easily understandable with the block diagram shown in the figure 1. The block diagram gives a brief description about the design. From the figure 1, it can be easily understood that two modules are implementing simultaneously i.e. Vehicle Tracking using GPS and Accident Reporting System using GPRS.

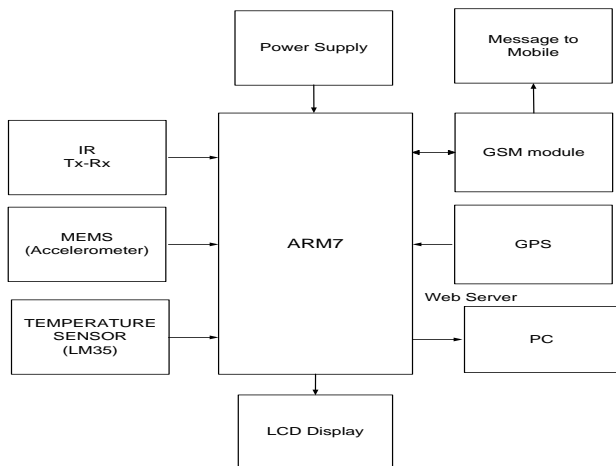


Figure 1: Block Diagram

In accident reporting system the given inputs are IR Tx-Rx, Accelerometer sensor, Temperature sensor and GPRS module. The first step it checks for the IR Tx-Rx whether an object is coming closure to the vehicle or not. If an object is coming closure then it checks for vibrations by using accelerometer sensor. If the vibrations exceeded than the threshold given that indicates another vehicle hits the source vehicle so it immediately checks for the temperature sensor (LM35) output. If LM35 output also exceeds the threshold value that represents vehicle engine blown out and indicates accident occurred. Now the essential task is reporting that accident to the family members through GPRS modem. ARM LPC 2148 uses the "AT" commands for sending SMS through GPRS modem. The following are the AT Commands used in this design shown in below table.

Table: AT commands used for GPRS modem

Commands	Description
AT	Checking the communication between the module and computer
ATE	Command Echo
AT+CSQ	Checking Signal Quality
AT+CMGF	Set message format
AT+CNMI	New message indications to TE
AT+CMGS	Send Message

In-vehicle following framework the sources of info given are GPS and GPRS modem. GPS module is utilized to pinpoint the area of the vehicle by the co-ordinate's scope and longitude. To improve the coordinates from the GPS module the command "\$GPRMC" is utilized.

The circuit chart of the vehicle follows and mishap announcing the framework is shown in the following figure 2.

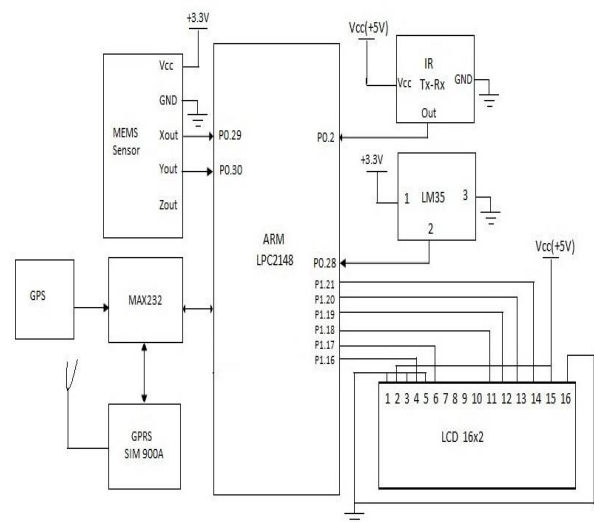


Figure 2: Vehicle Tracking and Accident Reporting System



The entire operation of the proposed system is clearly defined in the following flow chart shown in the figure 3.

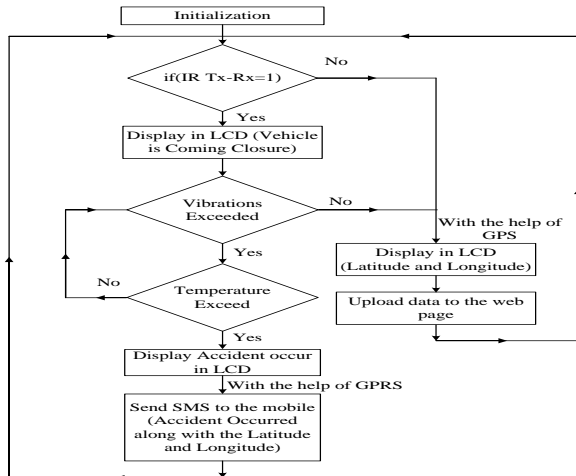


Figure 3: Flow Chart for the Vehicle tracking and Accident Reporting System

The above flow chart clearly discussed about the functioning of accident reporting system and vehicle tracking simultaneously based on the IR Tx-Rx and upload the data into the webpage.

III.RESULTS & DISCUSSIONS

At the point when IR Tx-Rx is ON, on the off chance that the vibrations surpassed, at that point, it checks for the temperature. On the off chance that it surpasses the edge, at that point an SMS send to the versatile showing that mishap happened. With the assistance of the GPS module, the Latitude and Longitude coordinates are sent to the versatile utilizing GPRS modem.

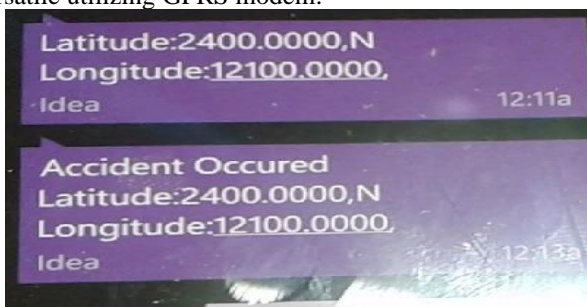


Figure 4: Vehicle tracking and Accident Reporting System

THE SIMULTANEOUS OUTPUT OF VEHICLE TRACKING AND ACCIDENT REPORTING SYSTEM IS SEND VIA SMS TO MOBILE SHOWN IN THE FIGURE 8.

IV.FUTURE SCOPE

In this paper, it has been stated that the location of a vehicle has been tracked with the help of GPS module and when the accident happens it is reported to the mobile through SMS to the family members. There is a wide advancement in the technologies and there are wide varieties of GPS modules exist. Differential GPS module which is more reliable and efficient than the GPS module used in this system. There is a problem in defining the co-ordinates of GPS module due to the disturbances created by the other vehicles so there may be chance of displaying wrong co-ordinates. So if an efficient filter is used for the correct latitude and longitude

co-ordinates which can be recursively calculated by using the errors. Kalman channel predicts the evaluated condition of the time 't' utilizing the assessed condition of the time 't-1' and in refreshed stage, it consolidates the time 't' state gauge with the current estimated qualities and updates the present state gauge.

V.CONCLUSION

The basic aim of proposing this model is to explore an ARMLPC2148 with an application of accident reporting and location tracking system. The two modules are done separately and then simultaneously both the modules are worked out based on IR Tx-Rx. The data from the GPS module i.e. latitude and longitude co-ordinates are uploaded into the web page. Finally exploring over ARMLPC2148 is done with two specific applications and the outcomes are analyzed and verified.

REFERENCES

1. Jacques Georgy, "Vehicle Navigator using a mixture particle filter for inertial sensors / Odometer / Map Data / GPS Integration".
2. Md. Syedul Amin, Jubayer Jalil and M.B.I. Reaz "Accident Detection and Reporting System using GPS, GPRS and GSM Technology".
3. Yunsung Choi and Dongwoo Kim, "Quality Supporting Duration for Dual-Hop Vehicle-to-Vehicle Co-operative Communications".
4. Juan I. Godino-Llorente, "P2P multiuser Low-cost universal solution Solution for On-Demand GPS Positioning and Tracking in Large Environments".
5. Yen-Lin Chen, "A Real time vision system for Nighttime Vehicle Detection and Traffic Surveillance".
6. Nabil Mohamed Drawil, "Intervehicle Communication Assisted Localization".
7. Kichun Jo, "Interacting multiple model filter based sensor fusion of gps with in vehicle sensors for real time vehicle positioning".
8. Tang-Hsien Chang, Chih-Sheng Hsu, Chieh Wang and Li-Kai Yang, "Onboard measurement and warning module for irregular behavior".
9. SeokJu Lee, Girma Tewolde, Jaerock Kwon, "Design and implementation of Vehicle Tracking using GPS/GSM/GPRS Technology and Samrtphone application".
10. Du Rongyi, Ye Qing and Li Xue, "Design of control unit of Traffic Detection System based on ARM".

AUTHORS PROFILE



B Kedarnath was born in Andhra Pradesh, India in the year 2000. He is a student currently perusing Computer Science and Engineering in SRM Institute of Science And Technology located in Chennai, Tamil Nadu, India.



B Ramanuja Charya was born in Andhra Pradesh, India in the year 1999. He is a student currently perusing Computer Science and Engineering in SRM Institute of Science And Technology located in Chennai, Tamil Nadu, India.



Y V Avinash was born in Telangana, India in the year 2000. He is a student currently perusing Computer Science and Engineering in SRM Institute of Science And Technology located in Chennai, Tamil Nadu, India.

