

A Robust System For Vehicle Tracking And Accident Detection

Rajesh K M¹, Priyanka P², Rakshith Babu H V³

¹Assistant professor, Dept. of Telecommunication, GSSSIETW, Mysuru, Karnataka, India

²Assistant professor, Dept. of Electronics and Communication, GSSSIETW, Mysuru, Karnataka, India

³M.Tech in Digital Electronics, SJBIT, Bengaluru, India

Abstract- Vehicular monitoring in the continuous time is the important aspect of our daily life. In this paper, the design of vehicle tracking, accident detection and monitoring system is proposed. Global system for mobile communication (GSM) and Global positioning system (GPS) are used for tracking the location of the vehicle. MEMS sensor is used for accident detection. Temperature variations in the vehicle are monitored by temperature sensor. The proposed system provides the information like location of the vehicle, accident spot and temperature conditions. ARM7 processor is used to collect the information and then to transmit the same to the authorized user's cell phone using GSM.

Keywords- Global positioning system (GPS); global system for mobile communication (GSM); Micro-electro-mechanical Systems (MEMS).

I. INTRODUCTION

The total numbers of vehicles are growing rapidly day by day. Along with vehicles the death rate due to accident is also increasing. According to road statistics of India, one person is dying for every four minutes. Accidents are occurring due to lack of road availability compared to numbers of vehicle. In most of the cases, deaths are occurring due to no proper treatment at the right time. So in order to find a proper solution for these kinds of problems, this project is focused on monitoring the vehicle and recognizes the problem to notify to respected circle of the victim. GSM is required to interact with the proposed system to the user's cell phone device.

In the proposed system GSM SIM 3000 module [1] is used. This module operates on AT commands with TTL interface. The accident and vehicular monitoring system [2] is developed on arm platform using real time operating system [3]. The remaining part of this paper includes methodology of the proposed system, observed experimental results, advantages and conclusion.

II.METHODOLOGY

The block diagram of the proposed tracking system is shown in figure 1 which can be able to trace the location of the vehicle. It includes MEMS accelerometer, GPS receiver, GSM module, LCD display and temperature sensor. GPS is commonly used for tracking, since it is easy to use and also less cost.

The proposed system can also be used as anti-theft system to avoid the stealing of the vehicle. This system provides the location details like latitude and longitude coordinates and by using these we can locate and trace the particular vehicle on maps using internet. By implementing this system we can do real time tracking of vehicles in our day to day life like buses, trains and cars. Also by using this system as application in cell phones, we can get the arrival and dispatching of trains and buses in transportation area.

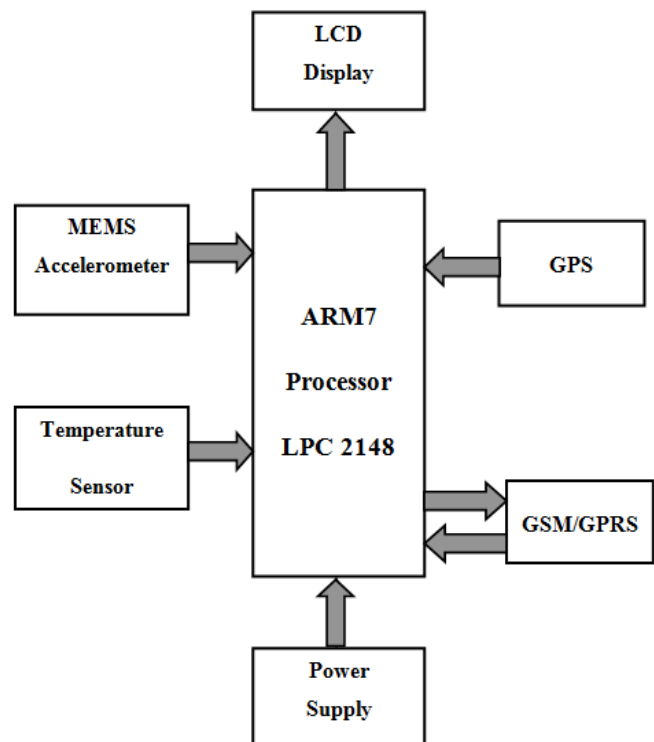


Fig 1: Block diagram of the proposed system.

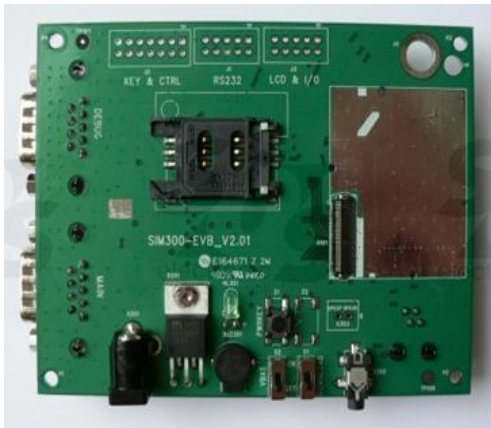


Fig 2: GSM module.

GSM module is used for sending and receiving of text messages of vehicle location coordinates from and to the registered users.

Figure 3 shows the GPS receiver which is used to send the geographical locations of the vehicle which are obtained from geographical satellites, ARM processor receives these coordinates in the form of latitude & longitudes then it sends that information as SMS via GSM module.

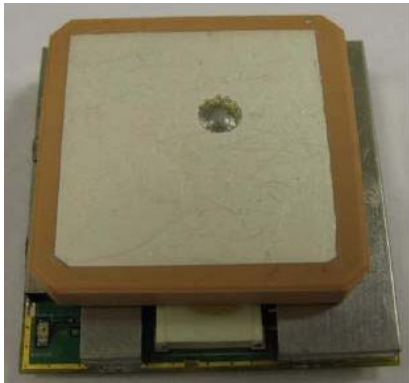


Fig 3: GPS receiver.



Fig 4: MEMS accelerometer

MEMS accelerometer is used for accident detection which is shown in above figure. It is a three dimensional device which senses in three dimensions i.e., X, Y and Z direction. If the vehicle is met in accident, MEMS

accelerometer will sense that and sends it to the ARM processor. This information is used to intimate the relative person of the accident victim and also to the nearest hospital and/or police station. 16X2 LCD display is used to displays the continuous updates of the system which includes tracking details, text messages and location coordinates. The proposed system is designed to work on 5V or 9V power supply. Storage device is used to store the continuous information recorded.

The working of the proposed system includes the following steps.

Step 1: Real time tracking information i.e., latitude, longitude and velocity to the registered users to notify the location details, accident details or theft details.

Step 2: Store the detected information in database at the same time display it on GUI.

Step 3: Accessing facility to the registered users to get real time tracking details.

Step 4: monitoring the temperature conditions of the system to avoid the burning of the vehicle due to fire or any obstructions.

III. RESULTS

The experimental results are shown below, which includes position coordinates, tracking details and text message notifications.



Fig 5: Displaying of position coordinates on LCD display.

Continuous updates of the monitoring system will be displayed on the 16X2 LCD display as shown in figure 2. All the updates are stored into storage memory.

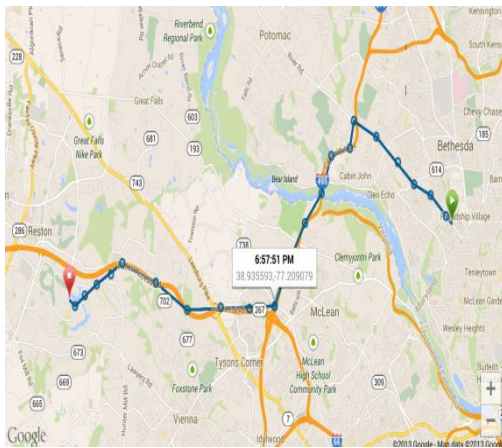


Fig 6: Vehicle tracking using Google map.

Figure 3 shows the real time tracking of the vehicle using google map, here the vehicle's position can be mapped and the location details can be found. GPS receiver is used to receive the location details of the vehicle.

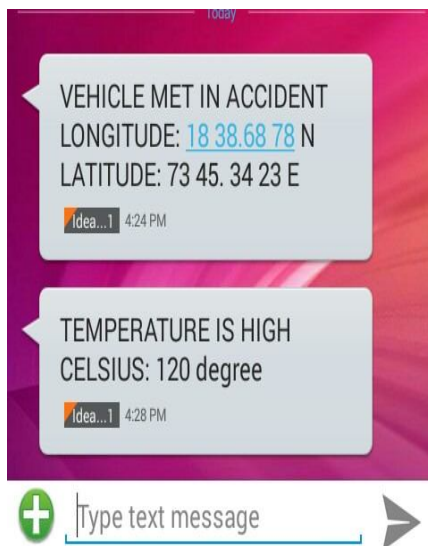


Fig 7: Text "SMS" notification.

If any variation or problem found in the system, GSM module used in the system which is given a set of AT commands so that it will able to send the information to the registered users via "SMS". The message may consists the information related to accident or temperature variation. This can be useful for in time notification to the concerned persons.

IV.ADVANTAGES

By studying the applications of the proposed system we can observe the advantages as listed below.

- Real time monitoring.
- Reduces the death rate.
- Cost effective.

V.CONCLUSION

This paper has presented the accident detection and vehicle tracking system. From the observed experimental results, the system is able to find the location and status of the vehicle. This system plays a vital role in the safety of the victims by notifying the family of victims if he met in accident by sending SMS. It can be used to decrease the death rate due to accidents. Finally due to all positive features, the system can be used to reduce the accident rates.

REFERENCES

- [1] Saurabh S. Chakole, Vivek R and Y. A. Suryawanshi, "ARM Hardware Platform for Vehicular Monitoring and Tracking", 2013 International Conference on Communication Systems and Network Technologies, IEEE proc.CSNT, 2013.
- [2] Md. Marufi Rahman, Jannatul Robaiat Mou, "Real Time Google Map and Arduino Based Vehicle Tracking System", 2nd International Conference on Electrical, Computer & Telecommunication Engineering (ICECTE), pp: 1-9, December 2016.
- [3] B.Praveen kumar, V.Anuragh, "Accelerometer Based Vehicle Monitoring And Tracking System Using ARM Processor And GPS", International Journal of Science Engineering and Advance Technology (IJSEAT), Vol 2, Issue 11, pp: 823-825, November 2014.
- [4] Dr.R.Ch A Naidu Nagababu.G, "An Advanced Trouble Intimation and Automatic Prior Notification System of Locomotives and its Conditions", International Conference on Computational Techniques in Information and Communication Technologies (ICCTICT), 2016.
- [5] Zhang Wen and Jiang Meng, "Design of Vehicle Positioning System Based on ARM" ,ISBN-number 978-1-61284-109-0, 2011 IEEE .
- [6] Peng Chen, "ShuangLiu, "Intelligent Vehicle Monitoring System Based on GPS, GSM and GIS", WASE International Conference on Information Engineering. 2010.
- [7] Varsha Gaud and V. Padmaja, "Vehicle Accident Automatic Detection and Remote Alarm Device", IJRES, Vol.1 No.2, 2012.
- [8] Lu Xutao1, Cui DongSen2" Design of Transport Vehicles Remote Monitoring System", 2nd International Conference on Education Technology and Computer (ICETC). 2010.