

Accident Location Detection Using Vehicle Tracking System

Addala Suryanarayana Murthy, ¹T.Ravindra

¹M.Tech Student, ¹Assistant Professor

¹Gayatri Vidya Parishad college of Engineering, Visakhapatnam, 530048

Abstract

Traffic flow and congestion management are major problems during these days. Day by day road accidents in the city have been increasing and the loss of life due to the accidents is also increasing either due to lack of intimation to emergency services or late intimation. By implementing Accident Location Detection using Vehicle Tracking System, an automated control unit is developed which provides information both to the main server and to the manually registered phone number about where the accident happened (location) in the form of latitude and longitude. This enables emergency services to reach the accident area in time and can rescue the victims of the respective accidents.

Keywords

GPS, GSM, GUI

I. Introduction

Emergency occurs anywhere at any location, at any time, and in various ways will make one at risk. Loss of life results due to the delay in the intimation to the main server about the Accident location. Thus we propose a new design to automatically detect the accident location details and intimate to the server unit.

The entire system contains two units, the first one is Vehicle unit (Transmitter) it is present in every vehicle and the second one is server unit (Receiver) which is emergency service control unit.

Every vehicle unit has four major components. Mercury switch, GPS^[1] Module, GSM module, Microcontroller unit. It is designed to sense the accident impact from the sensor and then it retrieve the location co-ordinates from the GPS unit, made as a frame and sends it to the GSM unit and then it sends messages to the manually registered phone number and pre-programmed emergency number.

Server unit contains a GSM module and a PC with Microsoft visual studio software. Using Microsoft visual studio software an application is designed (GUI). It continuously monitors the GSM modem which is present in the server unit for recent inbox messages and the co-ordinates in the message are redirected to the internet explorer in the GUI.

Vehicle tracking is also designed. Whenever the programmed password is send to the GSM unit in the vehicle from any phone then it sends the location coordinates only to the manually registered phone number.



Fig. 1: Block Diagram of vehicle tracking

II. Literature Survey

This paper presents a new scheme called AARS (Automatic Ambulance Rescue System) to reduce the time for the ambulance to reach the hospitals in time and thus minifying the expiration of the patients by controlling the ambulance to know the accident spot through sensors, choose appropriate route to reach hospital and controls the traffic lights.[1]

A new scheme called ITLS (Intelligent Traffic Light system to provide a smooth flow for the emergency vehicles like ambulance to reach the hospitals in time and thus minimizing the delay caused by traffic congestion by automatically controlling the traffic lights in the path of the ambulance making use of GPS is explained in this paper. [2]

This document gives a complete idea on interfacing the GPS and GSM modules to ARM microcontroller (LPC2148) with examples in C language. [3]

III. Basic Block Diagram

The block diagram consists of following

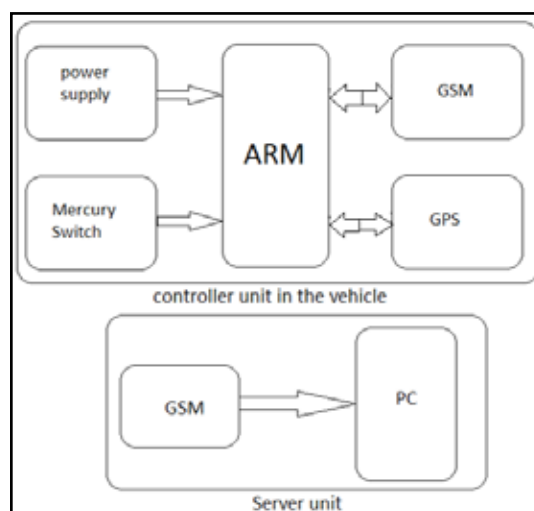


Fig. 1: Block Diagram

The above block diagram shows interfacing of modules to the vehicle unit and the server unit.

The Mercury switch used in this project as an input sensor which is to detect the accident impact. Whenever a vehicle hits an obstacle the collision is detected by the mercury switch and it sends signal to the microcontroller.

The GPS module is used get the location co-ordinates, it continuously receive the signal from satellite. To invoke the GPS receiver a simple command GPGGA is used.

The GSM module is used to communicate with the microcontroller to send messages to mobile phones through UART. To communicate over UART or USART, we just need three basic signals which are namely, RXD (receive), TXD (transmit), GND (common ground).

The server unit contains a GSM modem and a PC with visual basics software. The GSM modem which is connected to PC is interfaced through uart and visual basics software is used to design an application to monitor the accident location of the vehicle.

IV. New Proposed Scheme

The Accident Location Detection using Vehicle Tracking system is implemented by using some hardware interfacing and GUI (Graphical User Interface) application. Microsoft Visual Studio is an integrated development environment (IDE) from Microsoft. The below windows shows the sample GUI of Monitoring window. The below windows shows the screens of GUI.



Fig. 2: GUI of Monitoring window at server system

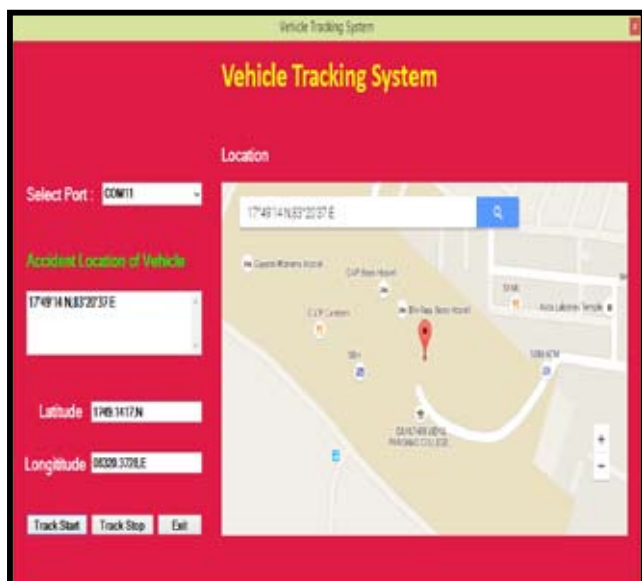


Fig. 3: Mapping the location of accident in server system

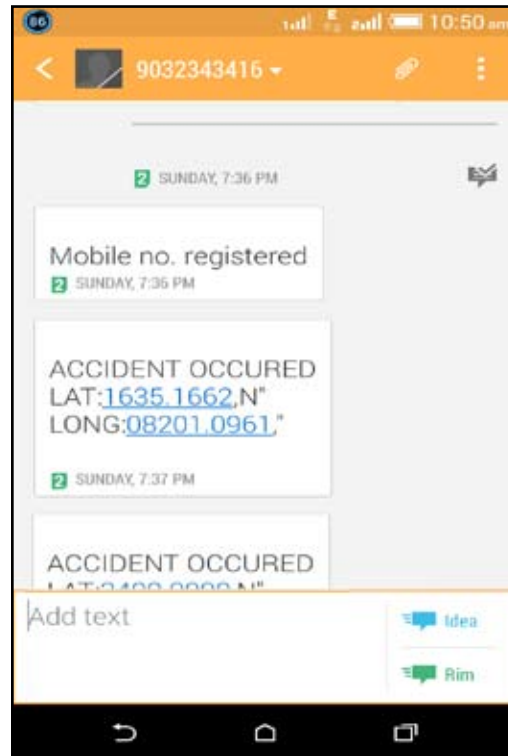


Fig. 4: showing accident location coordinates in the manually registered phone number

V. Conclusion

In this paper sensors, GPS and GSM are interfaced to the microcontroller. The data from the location from the GPS made as a frame and then it sent to GSM modem. The GSM modem sends the data to the pre programmed phone numbers. Hence Accident Location detection using Vehicle Tracking system using ARM was developed. The developed system simulation is successful in sending the data received from the input and the GPS receiver to the pre programmed phone numbers. In this project only one input sensor is used to detect the accident impact. This thesis can be further extended by taking multiple sensor inputs with different ID's. Then it can be implemented to detect not only the accident impact and also to estimate which part of the vehicle is exposed to the accident, before the police arrives to the accident location it automatically send a message to server. Then the vehicle can be cleared immediately from the traffic.

References

- [1] K.Athavan, S.Jagadeeshwaran, G.Balasubramanian, N.Dinesh, G.Abhilash, G.Gokul, "AUTOMATIC AMBULANCE RESCUE SYSTEM", *International Journal of Advanced Technology & Engineering Research (IJATER)*.
- [2] K.Sangeetha, P.Archana, M.Ramya, P.Ramya, "Automatic Ambulance Rescue with Intelligent Traffic Light System", *IOSR Journal of Engineering (IOSRJEN)*.
- [3] www.pantechsolutions.com, GPS and GSM interfacing to a LPC2148 (ARM) microcontroller.
- [4] Hind Abdalsalam Abdallah Dafallah "Design and implementation of an accurate real time GPS tracking system" *IEEE journal* 2014.
- [5] Wang Wei, Fang Hanbo, "Traffic accident auto-matic detection and remote alarm device", *Proceed-ings of International Conference on Electric Infor-mation and Control Engineering*, pages: 910-913, 2011.