

Real Time Bus Monitoring ,Controlling,Tracking And Accident Detection System

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ABSTRACT

The ability to track, control and trace device has been mankind's unfulfilled desire. At the same time person wanted to be safe at any place . The usefulness of artificial intelligence, GPS and GSM has made them popular in their own context, integrating these technology can prove to be a good solution for many problems .The idea behind this paper is to use all of these technology together and develop an effective application for vehicle tracking as well as accident detection. This will provide benefit of tracing as well as safety. The speed limit, Door open and close, Leakage of gas is also detected by system. In this system, an efficient vehicle wireless system is designed and implemented for vehicle accident detection and reporting using accelerometer, pressure sensor and GPS. Accelerometer sensor and a pressure sensor is used to detect accident and GPS give a location of a vehicle. In a case of any accident, the system sends notification to nearby ambulance or hospital, police station and person's relatives.After getting notification if any damage is not there then, person can avoid help. Traffic congestion and Road accidents are the major problems in urban areas. Also, due to the delay in reaching of the ambulance at the accident location and the traffic congestion in between accident location and hospital, there is an increase in the chances of the death of a victim. So, to provide a solution for this problem, we developed an application which detects accident automatically as well as sends the notification to nearby emergency services like hospital, ambulance, police station along with his personal information. The whole system will be implemented in Microsoft .net technology. For system components C#.net is used and for web based part ASP.net will be used.

Keywords—GPS ; GSM ; Tracking system; Microsoft .net

INTRODUCTION

Consider company providing bus service for school having many vehicles, managing all such vehicles, Keeping track of of their drivers, Each time checking for safety is very difficult. So, there is need of system which could maintain all of these things. We can provide add on this by getting live location of each vehicle and finding their path, also we can determine what their current speed is. In our system, there will be one admin of system, who will going to control all his vehicles by using our application. The each and every bus have GPS tracking system, accelerometer are present at their door side,

Pressure sensor is attached to the front and backside. Each vehicle is track using GPS, it will give admin current location of his vehicle. One threshold value is first fix for pressure sensor and accelerometer. If the value of the pressure sensor is goes beyond threshold value, then it sends notification to the microprocessor which will

indicate that there is accident. Accelerometer indicates accident in case of vehicle is move down to the door side. Speed sensor will give us information about current speed of admin and leakage sensors and temperature sensor provides notification about gas leakage. The extra functionality will also provide by our application like ignition on-off, door open-close,overspeeding , Geofencing. Geofencing determine whether vehicle is arrive in particular area or not.

II.EXISTING TECHNOLOGIES

A. Automotive Navigation System

An automotive navigation system is a satellite navigation system designed for use in automobiles. We may see this system primarily in high cost cars. It typically uses a GPS navigation device to acquire position data to locate the user on a road in the unit's map database. Using the road database, the unit can give directions to other locations along roads also in its database. Dead reckoning using distance data from sensors attached to the drivetrain, a gyroscope and an accelerometer can be used for greater reliability, as GPS signal loss and/or multipath can occur due to urban canyons or tunnels, also this device can lead the driver to a particular destination by sensing the position of the car continuously. The portable GPS devices have helped increase and enhance safety for the people. In addition, the GPS system is a phenomenal navigational tool that is vital to every traveler. This system is good for the driver but by this system the owner of the vehicle cannot know the current vehicle details as and when needed, so this system may be useful to the driver but it is not that useful to the owner of the vehicle who may want to keep a watch on the driver.

B. GPSylon System

GPSylon is able to show maps downloaded from the expedia map servers. It may connect to a GPS device and track your position on the maps. At the moment, it is able to read GPS data in the NMEA standard from a serial GPS device, a file or a GPS daemon across a network. The main feature is the display of various maps. GPSylon allows the user to navigate around like in a digital atlas. It shows maps of different scales, so missing maps of one scale do not result in a black screen, but show the next larger scale. It allows the download of a single map or for a given location or for multiple maps in a given rectangular area from mapblast or expedia map servers. In the download mouse mode the user may choose a single map or by dragging a rectangle with the mouse, the user may choose to download maps for a larger area. This functionality allows the user to download maps in a given scale for a larger area. It is a desktop application so it requires installing on every machine, also it needs to download maps from servers which in turn affect their performance. It cannot control subparts of a vehicle. So a GPSylon System is far better than Automotive Navigation System discussed before.

C. Open GTS(GPS Tracking System)

It is an open source project designed specifically to provide web-based GPS tracking services for a "Fleet" of vehicles. It was designed to fill the needs of an entry-level Fleet tracking system; it is also very highly configurable and scalable to larger enterprises as well. Open GTS is entirely written in JAVA, using technologies such as Apache Tomcat for web service deployment, and MySQL for the datastore. OpenGTS

comes with support for OpenLayers/OpenStreetMap The main disadvantages of this system is that it only supports vehicle fleet tracking and not others, it uses the only GPS network to get the data but not the GSM network so the system cannot communicate with the device. Still this is far better than the above two system

D. ACCIDENT DETECTION SYSTEM

This system is using the heart beat sensor based mobile technology integrated with the android smart phone. The normal human heart beat range is 60 to 100 Beats Per Minute (BPM). If there is any variation from the normal heart beat range, then the system detects that may be an accident or not. Then the system will immediately transmit the location of the accident to the pre-configured contacts through Short Message Service (SMS). In case of an accident is occurred then the driver is prompted to respond by touch or voice in order to eliminate any false detection. But this system also have some limitation that its not so much user friendly.

III. PROPOSED SYSTEM

GPS satellite sends GPS data to the device which temporarily stores the data in case of bus we use AVL (Advance Vehicle Locator) and in case of accident we use a pressure sensors and accelerometer. This device contains a SIM card which is used to communicate with the local GSM network thus the device uses GPS as well as GSM network. The data on the device is send to the tracking server via GPRS through the local network. On the tracking server there is a software component called as Socket Listener to get the data from the device on a particular socket. After the data is received in hexadecimal format it is parsed and converted to readable format by the parser and converter, the data is then stored into the database and further processing is done for alerts and reports generation. There are web pages integrated with Google map and other APIs for the purpose of viewing the vehicle on GUI.

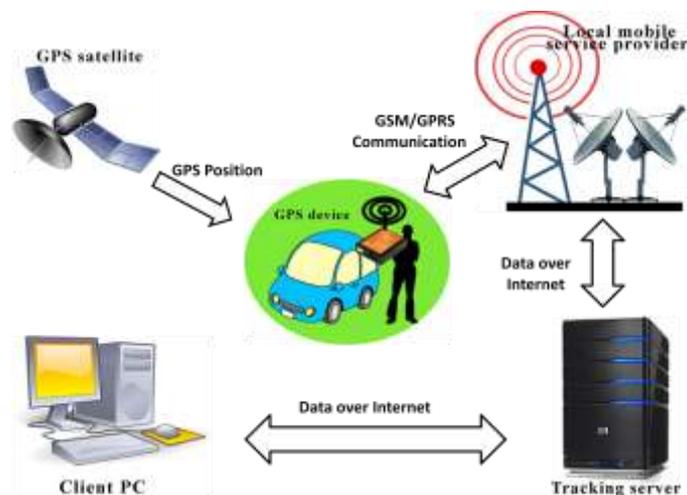


Figure 1. Tacking of vehicle using system

The generated notification will send to corresponding users like near by police station , ambulance and admin. In case of gas leakage we are going to use sensor like MQ6 and temperature sensor DS18B20 .In case of accident system will work as shown in figure.



Figure 2. Accident detection using system

IV.CONCLUSION AND FUTURE WORK

The vehicle tracking , monitoring, controlling and accident detection integration for vehicle and for person's life objects can be very helpful instead of just using GPS network alone.

This system can be further extended for multiple applications as follows

- Managing of public transports.
- Tracking of valuable assets
- Battery low alert, Fuel level alert, AC on/off

Thus, this system can prove to be very helpful in future.

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