Automatic Vehicle accident detection & Localization of Automobile using GPS/GSM.

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Abstract: **The Rapid growth of technology and infrastructure has made our lives easier. The advantage of technology has also increased the traffic hazards and the road accident take place frequently which causes huge loss of life and property because of the poor emergency facilities. Our project will provide an optimum solution to this draw back. An integrated Cell phone GPS-GSM system is proposed to track vehicles using Google Earth application develop in android application for mobile system. The remote module has a Bluetooth mounted on the moving vehicle with attached accident detecting sensor to identify if accidents happens. Here Bluetooth will be the medium of communication with the user mobile for activating the GPS position of the cell phone. In this case cell phone will get activated its application and track the current position of the vehicle and send it to the remote located predefined phone for tracking the real time position of the situation. After data processing, Google Earth application can be used to view the current location and status of each vehicle. (To detect the real time localization of the vehicle using Bluetooth technology with GPS locator in cell phone using android application.)**

Keywords: Bluetooth system, cell phone GPS-GSM technology, android application, accident place locator

I. INTRODUCTION

The ability to accurately detect a vehicle‟s location and its status is the main goal of automobile trajectory monitoring systems.& also The high demand of automobiles has also increased the traffic hazards and the road accidents. This is because of the lack of best emergency facilities available in our country This design is a system which can detect accidents in significantly less time and sends the basic information to first aid center within a few seconds covering geographical coordinates, the time and angle in which a vehicle accident had occurred. This alert message is sent to the rescue team in a short time, which will help in saving the valuable lives. These systems are implemented using several hybrid techniques that include: wireless communication, geographical positioning and embedded applications. project will establish a communication between the control station and the unit installed in vehicles. Vehicles will have GPS/GSM enabled tracking modules and will be tracked in real time using cellular networks. The software embedded in the microcontroller will control the various operations of the device by monitoring waveform from the vibration sensor. In case of accident the device will send an alert message along with location data from GPS module to control station using GSM network. It is a comprehensive and effective solution to the poor rescue response in case of accident. The accident reporting can automatically find a traffic accident, search for the spot and then send the basic information to the rescue agency covering geographical coordinates and the time and circumstances in which a traffic accident took place. At the server end, a control function will extract relevant data

1.1 Automatic Accident Detection and Reporting System using GSM and GPS:

Traffic has become an important event in the national interest now-a-days. We see that a lot of life spoils in every accident because of typically long response time to access the appropriate care that may be available if informed in-time. Application of our project can significantly shorten the response time of accident. This is a platform for emergency rescue which will operate within a minimal time. Besides, assignments can be scheduled in advanced based on current automobiles location. Therefore, central fleet management is essential automatically detecting the accident and a hardware to develop a machine, which will track the real time location and store it in a database, to which accident information From prototypes will be polled in real time. Our system combines advanced hardware design and sophisticated control technology into a compact, reliable package. The vehicle tracking systems are designed to assist corporations with large number of automobiles and several usage purposes. A Fleet management system can minimize the cost and effort of employees to finish road assignments optimally in order to reduce the golden time of arrival of rescuers in case of road accidents, when every micro-second counts. Our project aims to present a technology large enterprises to meet the varying requirements of tracking device based on GSM/GPS technology informing customers and to improve the productivity [1]. So taking at the occurrence of accident with sufficient details like in action all these things we are going to design and exact location and time at which accident happened. This

of the vehicle using blue tooth technology with the help of an android base mobile phones. The ability to accurately detect a vehicle‟s location and its status is the main goal of automobile trajectory monitoring systems. These systems are implemented using several hybrid techniques that include: wireless communication, geographical positioning and embedded applications. The vehicle tracking systems are designed to assist corporations with large number of automobiles and several usage purposes. This system can minimize the cost and effort of employees to finish road assignments within a minimal time. So taking in action all these things we are going to design and develop a machine, which will track the real time location of the vehicle using blue tooth technology with the help of an android base mobile phones.

The main goals of this project is to design and develop an economical model, which requires less power with less complex in structure, easy to implement. An additional setting could be implemented to interface the system to the car‟s alarm to alert the owner on his cell phone if the alarm is set off. The automobile‟s airbag system can also be wired to this system to report severe accidents to immediately alert the police and ambulance service with the location of the accident

II. LITERATURE REVIEW

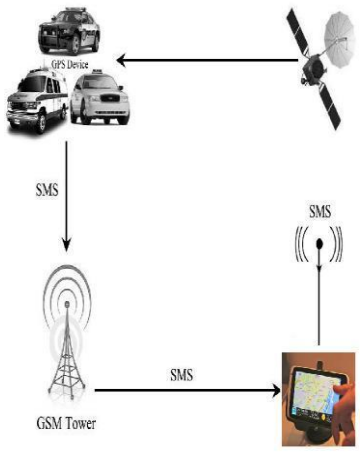
Traditionally, navigation systems have been large, expensive, and used only in aviaion or military applications. However, the presence of the GPS and the recent proliferation of small low-cost motion sensors have made possible navigation systems that are small and inexpensive enough to be used in consumer products. Commercial consumer-grade navigation systems are, in fact, readily found today in Japan, Europe, and the United States, with one application being automobile navigation systems.

The concept of in-vehicle navigation systems is not new, but implementations of such systems are relatively recent. Programs investigating the possibility of establishing an infrastructure to support widespread navigation for motor vehicles began in the U.S. as early as the late 1960‟s. However, results from these studies deemed that the supporting infrastructure for such a system would be too expensive, and further study in the United States was dropped until the 1980‟s. In the late 1980‟s, the U.S. government, recognizing that parts of the country‟s road system were taxed nearly to capacity, launched a campaign to promote the application of high-tech solutions to enhance roadway efficiency. Outlined in the National Program Plan for Intelligent Transportation Systems (NPP), this campaign includes a strategy for improving the efficiency of the U.S. highway system over a 20-year period. The NPP‟s goals include reducing highway congestion and fuel consumption and the number of traffic accidents by providing drivers with real-time traffic information, route guidance, electronic toll collection, knowledge of a vehicle‟s location lies at the heart of many services described in the NPP (e.g., route guidance and emergency response). In Japan, research efforts in real-time automobile route guidance were begun in the 1970‟s with the goal of reducing traffic congestion. Throughout the 1970‟s and 1980‟s, the Japanese government, in cooperation with industry, was continuously involved in launching initiatives which helped to mature vehicle navigation technology. Today, most Japanese car manufacturers offer factory-installed navigation systems in at least some of their models. Estimates indicate that, by the year 2000, per annum sales of vehicles with factory-installed navigation systems will be reach 2.5 million.

Many researchers have proposed the use of cutting edge technologies to served the target of vehicle tracking. These technology include Communication remote Control, GPS, GIS server systems and others.

III. ARCHITECTURE OF GPS TRACKING AND GSM MODULES

In this paper, we describe the design of a proposed tracking system in this paper is designed to track and monitor automobiles‟ status that are used by certain party for particular purposes, this system is an integration of several modern embedded and communication technologies. To provide location and time information anywhere on earth, Global Positioning System (GPS) is commonly used as a space-based global navigation satellite system. The location information provided by us GPS systems can be visualized using Google Earth technology. In wireless data transporting, Global System of Mobile (GSM) and Short Message Service (SMS) technology is a common feature with all mobile network service providers. Utilization of SMS technology has become popular because it is an inexpensive, convenient and accessible way of transferring and receiving data with high reliability. As shown in figure (1), the proposed system consists of: in-vehicle GPS receiver, GSM modems (stationary and in-vehicle), and embedded controller. The users of this application can monitor the location graphically on Google Earth; they also can view other relevant information of each automobile in the fleet.



advanced vehicle collision avoidance systems, and automatic notification to authorities in the event of a traffic

The implemented tracking system can be used to monitor

various parameters related to safety, emergency services and engine stall. The paper shows an implementation of several modern technologies to achieve a desirable goal of fleet monitoring and management.

The system has two main modules, as shown in figure (2). The first module is the tracking device which is attached to the moving automobile. This module composes of a GPS receiver, Microcontroller and GSM Modem The GPS Receiver receives the location information from satellites in the form of latitude and longitude real time reading. The Microcontroller has three main tasks to read certain engine parameters from automobile data port (OBD-II), to processes the GPS information to extract desired values and to transmit this data to the server using GSM modem by SMS. The chosen engine parameters are Revaluation per minute, engine coolant temperature, vehicle speed.

The second module consists of a recipient GSM modem and workstation PC. The modem receive the SMS that includes GPS coordinates and engine parameters. This text is processed using a Visual Basic program to obtain the numeric parameters, which to be saved as a Microsoft Office Excel file The received reading of the GPS is further corrected by Kalman filter technology. To transfer this information to Google Earth, the Excel file is converted to KML, Keyhole Markup Language format.

Google Earth interprets KML file and shows automobile‟s location and engine parameters on the map. The system‟s efficiency is depend on the sufficiency of the used communication network.

An additional setting could be implemented to interface the system to the car‟s alarm to alert the owner on his cell phone if the alarm had set off. The automobile airbag system can also be wired to this system to report severe accidents to immediately alert the police and ambulance service with the location of the accident.

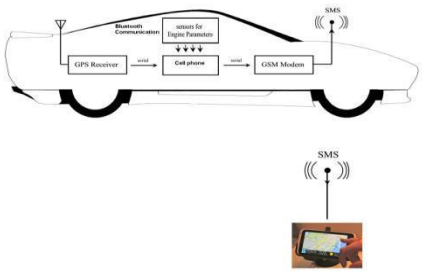


Figure 2: The system architecture: GPS tracking and GSM modules.

The second stationary module is a receiving module to collect

and process the transmitted information to a compatible format with Google Earth to remotely monitor the automobile location and status online. The transmit location of the vehicle has been filtered using Kalman filter to achieve accurate tracking. The *2DRMS* accuracy of estimated vehicle coordinates has been enhanced. The accuracy of filtered coordinates was less than 15 meters compared to about 43 meters for transmitted co-ordinates received by in vehicle GPS module.

CONCLUSION

In this paper, a real-time automobile tracking system via Google Earth is presented. The system included two main components: a transmitting embedded module to interface in-vehicle GPS and GSM devices in order determine and send automobile location and status information via SMS.

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