Finding Hit And Run Vehicle Using GPS Tracker

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Abstract- **An efficient vehicle tracking system is designed and implemented for tracking the movement of any equipment vehicle from any location at any time. The proposed system made good use of a popular technology that combines a application with a microcontroller. The designed in-vehicle device works using GPS and GSM for mobile communication. This paper proposes a novel intelligent system which is able to automatically detect road accidents notify them through vehicular networks and estimate their severity based on the concept of knowledge interference. Using our tracking system we can keep track of the vehicles by periodically using GPS. GPS is one of the technology that are used in a huge number of applications today. One of the applications is tracking your vehicle and keeps regular monitoring on them. This tracking system can inform you the location and route travelled by the vehicle and that information can be observed from any other remote location.**

Index Terms—**GPS module, GSM, Lock system, LCD, PIC16F877A microcontroller, Vibration sensor.**

I. INTRODUCTION

Vehicle tracking system was first implemented for the shipping industry because people wanted to know where each vehicle was at any given time. These days, however, with technology growing at a fast pace, automated vehicle tracking system is being used in a variety of ways to track and display vehicle locations in real time. This paper proposes a vehicle tracking system using GPS/GSM technology.

Before arriving to the zero accident objective on the long term, a fast and efficient rescue operation during the hour following a traffic accident significantly increases the probability of survival of the injured, and reduces the injury severity.

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Hence to maximize the benefits of using communication system between vehicles, the infrastructure should be supported by intelligent system capable of estimating the severity of accidents and automatically deploying the actions required, thereby reducing the time needed to assist injured passanger

Many of the manual decisions taken nowadays by emergency services are based on incomplete or inaccurate data, which may be replaced by automatic system that adopt to the specific characteristics of each accidents.

For wireless data transmission, GSM and SMS technology are commonly used. The SMS technology through GSM network and GSM modem provide a user with vehicle Location information. Utilization of SMS technology has become popular because it does not required much cost. It is convenient and accessible way of transferring and receiving data with high reliability.

The basic purpose of a vehicle tracking system is to track a specific target vehicle or other objects. The tracking device is able to relay information concerning the current location of the vehicle and its speed, etc. Most of such tracking system consist of an electronic device as usually installed in-vehicle and can be used for tracking motor cycle, buses, and trains. The vehicle tracking system proposed in the paper has the following features.

Acquisition of a vehicle's geographic coordinates and a vehicle's unique ID from an in-vehicle device in real time using the GPS module. Transmission of a vehicle's location information and a vehicle's ID to a web server after a specific time interval using GSM/GPRS module. Database is to design to store and manage received vehicle's location information

II. LITERATURE REVIEW

In the number of works about this topic in the literature is not particularly large. In addition, most attempts to carry out a data mining process related to traffic accidents only considered data from a single city or a very small area, making results only slightly representative.Several works are based on data obtained from the Traffic Office of Ethiopia, since this country presents one of the largest number of accidents per capita. Beshah and Hill [29] used data from 18,288 accidents around Addis Ababa as the basic data set. This study uses Naïve-Bayes, decision trees, and k-nearest neighbors (KNN) algorithms to classify the data using a cross-validation methodology, with accuracy values close to 80%. However, the authors only provided estimations for the whole accident, not for single occupants. Data from Ethiopia was also used to build regression tree models for accident classification in [30]. Only 13 out of 36 variables available in the data were used to build the classification models, but the selection process was not shown, and again only estimations about the whole accident were provided.

The area of South Korea was also selected to develop classification models based on artificial neural networks, decision trees, and logistic regression [31]. The data set involved 11,564 accidents, and the authors concluded that the different classification algorithms provide similar results in terms of accuracy, being the use of protection devices, such as the seat belt and the airbag, the most relevant factors to classify accidents. This work was extended in [32] using ensemble methods (i.e., multiple models to obtain better predictive performance than could be obtained from any of the constituent models) combined with a prior assignation of instances through clustering, attaching a different classification model to each cluster, which produced a better class assignment More recently, Chong et al. [33] selected data from all over the United States obtained during the 1995-2000 period to propose a set of models based on artificial neural networks, decision trees, and Support Vector Machines (SVMs). All the classification models presented similar accuracy results, and they were highly effective at recognizing fatal injuries. From previous works, we detected significant shortcomings when attempting to combine their results with vehicular networks, since existing works about estimating the severity of road accidents have not been used to improve the assistance to injured passengers. All the above papers used a whole variety of attributes to build the classification models, whereas only some of them could be effectively extracted from the vehicle itself (e.g., the driver's inebriation level). In addition, none of them used an adequate feature selection algorithm to select the optimal variable subset. Finally, some of the models are extensively used (decision trees), while other interesting methods received minor attention (SVMs, and Bayesian networks).

III. PROPOSED SYSTEM

Our approach collects information available when a traffic accident occurs, which is captured by sensors installed onboard the vehicles. The data collected are structured in a packet, and forwarded to a remote Control Unit through a combination of wireless communication. In this project we proposed the design, development and deployment of GPS (Global Positioning System) based Vehicle Tracking and Alert System which allows traffic police control station to track vehicles which made accident, in real-time and provides an alert system. Now a day all the new vehicle consist of vibrating sensor and GPS system .we are modifying this system with GSM the proposed system diagram is shown below. The vehicle section module consist of Microcontroller,GPS module, vibrating sensor, lcd, GSM and a car lock system.

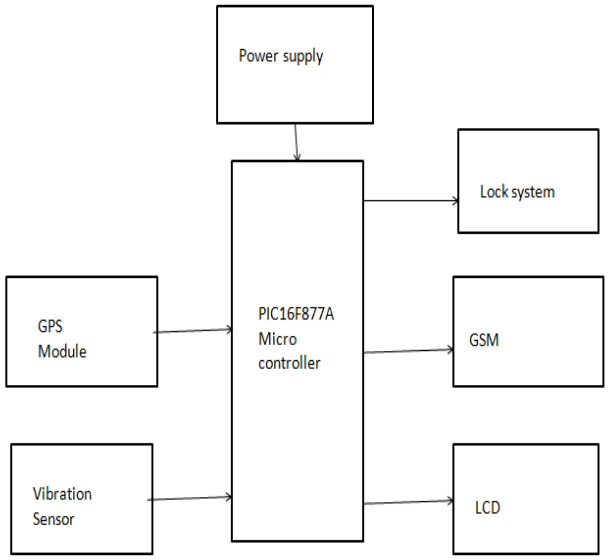

Figure .1

IV. WORKING OF PROPOSED SYSTEM

Using PIC16F877A microcontroller system we are proposing this system. Whenever a collision is occurred the vibrating sensor ON and it will activate the GPS system. Simultaneously the GSM will send message to nearby traffic police control station. The message includes the location, vehicle owner details. Using this information the police can trace the vehicle and identify the vehicle which made accident and trace the current location of that vehicle using GPS. Google Earth application can be used to view the current location and status of each vehicle. This system is a low cost and efficient tracking system.

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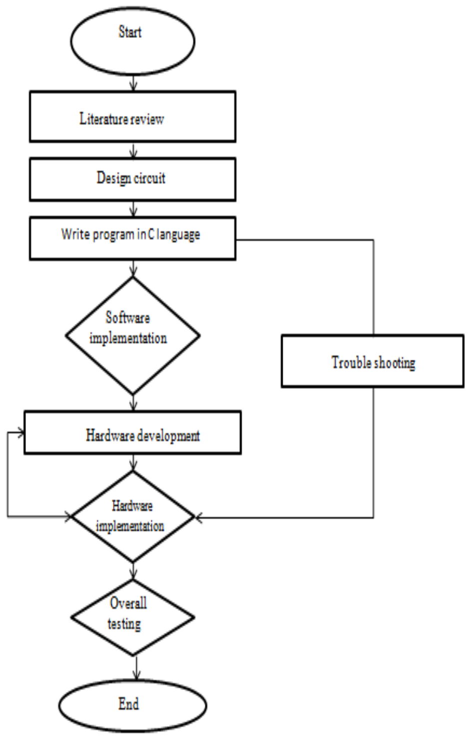

Figure.2

V. VIBRATION SENSOR

Vibration sensors are utilized in a number of applications to measure acceleration and/or vibration activity. Vibration sensors can be utilized to determine whether the machinery is operating properly. Vibration sensors can be useful for monitoring the condition of rotating machinery, where overheating or excessive vibration could indicate excessive loading, inadequate lubrication, or bearing wear. Such sensors are also utilized in geophysical applications and applications requiring accelerometers.

Vibration sensors are used as knock sensors in internal combustion engines. In order to assure that an engine is operating under optimum conditions, necessary to accurately monitor its actual operating state. One device known to be highly useful for this purpose is the engine vibration sensor. Vibration or shock sensors are commonly used in alarm systems to activate an alarm whenever the devices to which they are attached are touched, moved, or otherwise vibrated. For example, vibration sensors are commonly placed in windows of buildings to sense glass breakage and in car alarm systems to detect vehicle tampering.

Commercial vibration sensors use a piezoelectric ceramic strain transducer attached to a metallic proof mass in order to respond to an externally imposed acceleration. Piezoelectric vibration sensors used for detecting vibration from various vibration sources are generally classified into two large types, resonant type and nonresonent type. A capacitive vibration sensor or an accelerometer is formed from a capacitor one plate of which is a proof mass, with the other plate fixed to a substrate. Vibrations are typically measured using analog vibration sensing elements, such as analog accelerometers, positioned on machinery at strategic locations.

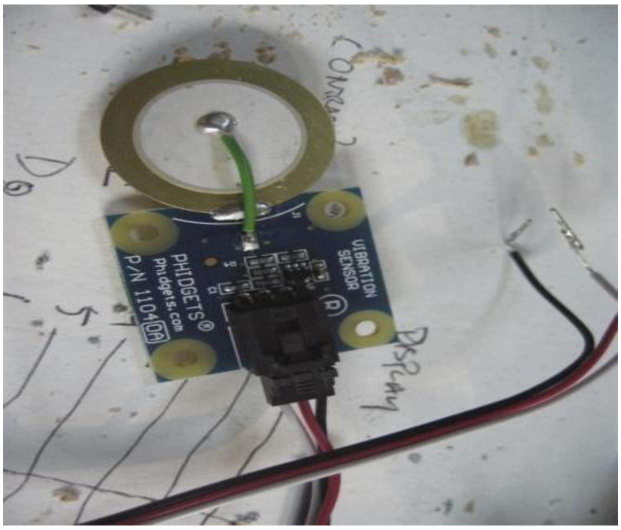

Figure.3

An impact sensor is normally fitted to the front of the vehicle as this is where a collision is likely to occur. The sensor is positioned inside the engine and a similar safety sensor is located inside the passenger zone to the vehicle. This safety sensor is required to measure the intensity of the collision to determine whether the impact is over a certain threshold frequency.

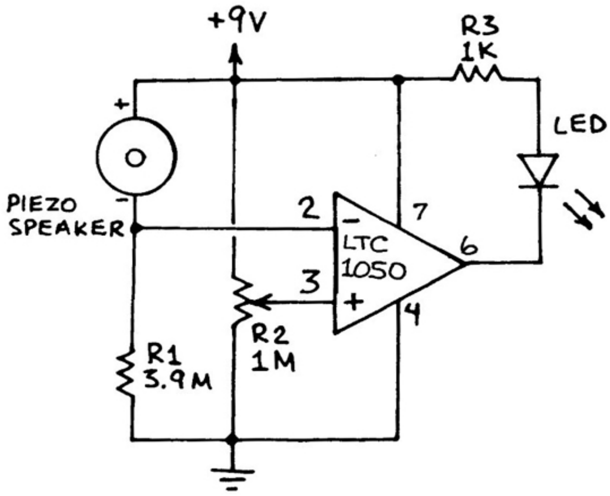

Figure.4

The two basic piezoelectric materials used in vibration sensors today are synthetic piezoelectric ceramics and quartz. While both are adequate for successful vibration sensor design, differences in their properties allow for design flexibility. For example, modern “tailored” piezoceramic materials have better charge sensitivity than natural piezoelectric quartz materials. Most vibration sensor manufactures now use piezoceramic materials developed specifically for sensor applications.

Flow chart for SMS

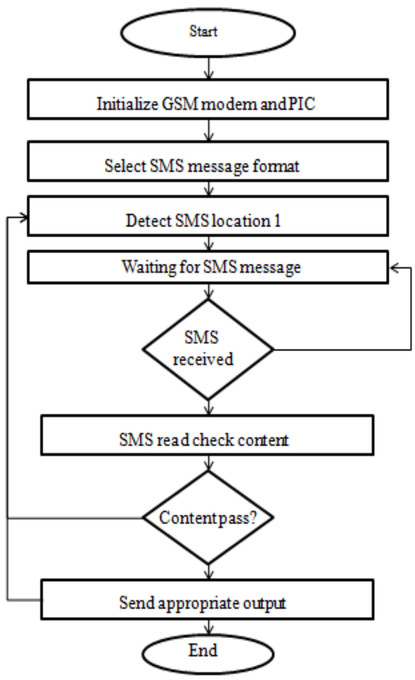

Figure.4

A. DESCRIPTION FOR FLOW CHART OF SMS

A GSM modem is connect to a PIC microcontroller. The GSM initializes the format of the SMS. Then it detects the location where the message to be sent. So it waits for the location tracking. Once the location is detected the message is sent and received. In the received segment it checks the content if the content is correct or pass message is sent in an appropriate output.

Flow chart for CALL

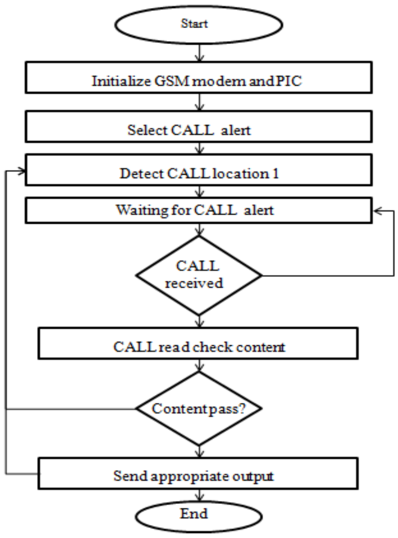

Figure.5

B. DESCRIPTION FOR FLOW CHART OF CALL

A GSM modem is connect to a PIC microcontroller. The GSM initializes the format of the CALL. Then it detects the location where the CALL to be connected. So it waits for the location tracking. Once the location is detected the CALL is forwarded and received. In the received segment it checks the content if the content is correct or pass CALL is sent in an appropriate output.

VI. RESULT

Figure.6

DESCRIPTION

Vehicle tracking systems based on social network services such as Twitter and Face book has attracted interest in a number of users. Each in-vehicle device has an account of the twitter social network and can identify the vehicle location in social network on a regular basis. A web interface is used to display a vehicle location placed on Google maps, and a status of a vehicle like door open/close, and ignitions on/off. Also, users can send commands from the web interface in-vehicle device to restart the vehicle or to shut down the vehicle. The proposed system can be accessed from a Smartphone more easily because the Smartphone has available social network services. So, the system would become more efficient to users of social network and Smartphone, they allow quick monitoring of the location and status of the vehicle.

. Testing Smartphone application

In order to demonstrate operation of the vehicle tracking system successfully, an Sony Xperia was configured with the developed Smartphone application. Two locations, one for the vehicle and the other remotely located user appear on the Google map. The location of the vehicle is updated from the in-vehicle tracking device. Also, the distance and time information between the two locations within the given route can be displayed. Whenever a vehicle location changes, the vehicle's address will be updated regularly. Fig. 7 shows our Smartphone application with the most recent vehicle's location information from a database.

VII. CONCLUSION

We developed and tested a vehicle tracking system to track the exact location of a moving or stationary vehicle in real-time. This paper has described the design and implementation of our vehicle tracking system. An in-vehicle device, a server and a Smartphone application are used for the vehicle tracking system. In this work, the in-vehicle device is composed of a microcontroller and GPS/GSM module to acquire the vehicle's location information and transmit it to a server through GSM network. On the other end, the web interface written in PHP is implemented to directly connect to a database. A vehicle's geographic coordinates and a vehicle's unique ID obtained from an in-vehicle device are recorded in a database table. And a Smartphone application has been created to display a vehicle location on Google maps. The system was able to experimentally demonstrate its effective performance to track a vehicle's location anytime from anywhere. Furthermore, our implementation is low-cost that is based on easily accessible off-the-shelf electronic modules.

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