A Review on Wireless Sensor Network in Intelligence Vehicle Monitoring System Using IOT

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Abstract—in today's world the life has become very fast. The main object of this paper is to review the past work of vehicle tracking, monitoring and alerting system GPS is one of the technologies that are used in a large 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 vehicle, and that information can be observed from any other remote location. It also includes the web application that provides you exact location of the target. This system enables us to track target. This system uses GPS and GSM technologies. In this electronic document a comprehensive review of all well-known tracking & monitoring techniques has been presented.

Keywords - GPS,GSM, vehicle Tracking, vehicle monitoring.

I. INTRODUCTION

A Vehicle tracking system is an electronic device installed in a vehicle to enable the owner or a third party to track the vehicle's location. All most modern vehicle tracking systems utilizes Global Positioning System (GPS) for accurate location of the vehicle[1].

Now a days, vehicle navigation, location concept is well defined & is frequently also used in recent years the problem of diagnoses of defects & faults on remote vehiclea low cost simplified yet versatile vehicle diagnostic system that is compatible with all vehicles manufactured after 1996 [2].

A large number of vehicle tracking systems are now using a form of automatic vehicle location (AVL) for easy location of the vehicle. This system can provide information about the accident to the nearby hospital and police station. So suddenly help can be received and thus life may be saved. The GPS satellite system was built and is maintained by government and is available at no cost to civilians. This makes the technology cost effective. A server computer at the monitoring station is continuously waiting for data from the system & is recording the actions of the vehicle into a database. This contains the information regarding Vehicle identity, position, velocity, and temperature. The development of vehicular design brings public much convenience in life. The thing we observe the vehicle theft is real time problem like accidents & many more hazards condition[3]. We daily see or read such type of activities which leads our safety & security in various public & private sectors.

II. VEHICLE TRACKINGAND MONITORING METHODS

A. *Raspberry pi*

The advance vehicle tracking & monitoring system is the Raspberry Pi this is the new technology is also called as Embedded Linux Board[3].That method consists of advanced feature of storing database at real time application. This system use SIM908 module through which that gives the exact location of vehicle and send the tracking information to the server & then sending the alert message to the owner. Again the new author do some work on the same thing. This system gives both pace & security of vehicle[4]. The VMSS (vehicle monitoring & security system) is a GPS based tracking system. The main application of GPS is tracking the vehicle to which GPS is connected that gives the information about the position of vehicle whenever it require & for security of each person travelling by the vehicle. This module is attach to the vehicle, it also has the ability to communicate over the remote areas where user needed. The current location of the vehicle. Next the vehicular module is use to track, monitor, & find the accident spot to the monitoring station[5]. This system provides the information about vehicle identity, speed & its position. The information is collected by the Raspberry Pi that uses different module & dispatch it to the monitoring station. It store the information in database & display that on graphical user interface(GUI) GUI is build on Microsoft visual studio 2010.

B. *Android Based Universal*

Nowadays, the advanced based system is used for the vehicle tracking. this system track the vehicle location by using the mobile device via a Bluetooth the data can be seen by the user and same data send to the vehicle maintenance department that detect & predict the fault in vehicle. In this system the hardware unit is used to interface between vehicle & onboard diagnostics system & Bluetooth module[6].

Also the new system aim is same to provide monitoring & tracking vehicle performance. These systems obtain the data & sent it to the mobile device via Bluetooth at low cost[4]. Then the collected data sent to the server which is access by owner to monitor the system. This system check the fuel level, temperature level & also give the data about safety belt, touch, place at which mischance will happen. Again the new technique is use in the vehicle tracking system[7]. This technique also display the situation of the vehicle on server mobile via Bluetooth, but only change is that, the data can be sent to the vehicles maintenance department which may be used to detect & predict the fault in vehicle. This is done by collecting the reading from the engine control unit (ECU). In this electronic hardware unit is use of interface between vehicles on board diagnostic system & a Bluetooth module. This method related to android based mobile device[8].

C. *Single Radar Vehicle Detector*

This system used a side looking single beam microwave & vehicle detector . This system is used 2-D radar Doppler frequency- modulated continuous-wave (FMCW) that uses squint angle. For tracking the speed & range of vehicle that used the inverse synthetic aperture radar (ISAR) algorithm. In this next is the single car- mounted camera is presented through which we can detect & track the position of vehicle. This system use two algorithm as [1] waldboost detector and [2] TLD tracker [9]. This system consists of single-camera base system, it is cheap, that consume minimum energy, it can easily be mounted on motor bike or even on a bicycle.

III.RECENT TRENDS

Traffic sign recognition is a main issue for driver assistance, because they play dual role, they control the road traffic & guide to the driver[10]. Here we detect the traffic for detection color based segmentation method is applied & then classified using HoG features & a linear SVM classifier. Now a days, In ATM cash filling vehicle we need to monitor position or path of vehicle whether it is moving in correct path or not. This system usesan ARM7 controller[11]. That tracks the vehicle & displays the current location of vehicle in the remote server using Google map. This design is cost-effective, reliable & has accurate tracking function. The system has on-board module which resides in the vehicle to be track.

The another thing is the student & staff are using the various transport facilities to reach the institutes for e.g. government bus, private bus, institute bus or own vehicle etc. most of the people prefer transport service that provided by institute due to safety & security reasons[9]. Most of the staff don't know the exact time & location of buses & them waiting for long time or sometimes miss the buses. There is various bus monitoring techniques to solve this problem such as

A. *Wilocator*

This is use to track & predict the arrival time of buses in an urban areas Wilocator predict the arrival time based on the surrounding Wi-Fi information. Wilocator provides services to many transit agencies, third party companies[2].

This is made of the components such as

    a)   Wi-Fi enabled commodity off-the shelf smartphones. (carried by bus drive for crowd sensing)

    b)   Smart phones continuously scan that Wi-Fi information & report it to the server, which includes real time bus tracking of the buses traffic map.

B. *Easy Tracker*

Is an automatic transit mapping. The transit agency must obtain smartphones that install an app & place a phone in each transit vehicle. It can either fit permanently in the vehicle or carried by the bus driver. A central location server can collect location updates from all in vehicle devices[3].

The records are set through by two ways

    a)   Batch processing

    b)   Online processing

In batch processing a large amount of recorded GPS traces are processed to produce route shapes, bus stop location & bus schedules. And in online processing matches vehicles to routes & perform the arrival time prediction (but this is very complex method & can be access only by transit authority)

C. *GPS-GSM Based Tracking*

This system is to track the location of bus with the help of Google map. After installation the system will locate target with the help of web application, which is a HTML based application in Google map. This web

application named as "Tracking system" this system has two applications, that are developed & they are link to each other. The first one is use to get initial position of the vehicle that is starting point, & system will receive the different coordinates that are longitude & latitude position switching. This application will run on WAMP server. This system allows tracking the target in any time & anywhere in weather conditions[7].

D. *Accident Alert*

This system gives the live updates of accidental vehicle with their location details. The system uses Raspberry Pi, Vibration Sensors, and GPS& GSM modules to detect accident. The GPS continuously takes the input data from the satellite & store the latitude & longitude values in ATmega16 microcontroller's buffer. To track the vehicle message has been forwarded to GSM device, by this it gets activated. It also get activated by detecting accident with the help of shock sensor that are connected to Raspberry Pi, once GSM gates activated it takes last received latitude & longitude position valves from the buffer. Then GSM sent the message to a central emergency dispatch server (that are predefined in the program)[9]

IV. APPLICATIONS

1)For Personal vehicle: The main application of vehicle tracking is for personal vehicle use if any unfortunate accident had occurred to a vehicle fitted with black box then immediate help can be provided to the victimized car on receiving SMS.

2) Insurance companies: Most of the time accidents are is false. So insurance companies can implement vehicle tracking in the insured vehicle and as a data before and at the time of accident is locked into black box. The insurance company can easily analyze the data recorded. And they can find out whether the accident had made or occurred, so the false claim is avoided.

3) Military applications: Military vehicles carry communication from one place to another for e.g. in Kashmir military vehicles can be fitted with car black box so if militants had attacked or damaged the vehicle immediate SMS is send to military based station and this ammunitions can be made save from wrong hands.

4) Fleet control: For example, a delivery or taxi company may put such a tracker in every of its vehicles, which helps the staff to know if a vehicle is late or in time, or is going in its assigned route. The same applies for armored trucks which transports valuable goods, as it allows pinpointing the exact site of a possible robbery.

5) Stolen vehicle searching: Owners of expensive cars can put a tracker in it, and activate them in case of theft. Activate is a command which is issued to the tracker, via SMS or otherwise and it will start acting as a fleet control device, and thus the user can know where the thieves are.

CONCLUSION

Here we compare different vehicle tracking system. The vehicle tracking systems can provide information of a vehicle like velocity, position, through a GPS module and identity of a vehicle to a monitoring station and to a mobile phone according to a definite event stored in a program or a query from a monitoring station. Such as android based mobile application software is used to create an on-board vehicle diagnostics system, also whenever there is vehicle theft situation or accident occurs the system provide vehicle current location, speed & number of passengers to the vehicle owners mobile. And in certain situation also provide the collision detection & traffic sign recognition of vehicles which play an important role in our daily life.

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