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Finding Hit and Run Vehicle Using GPS Tracker

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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 property and most of the case the vehicle which made accident will escape and difficult to keep in track of these vehicles, especially in night time. Our project will provide an optimum solution to this draw back. Using our tracking system we can keep track of the vehicle by periodically using GPS. GPS is one of the technologies that are used in a huge number of application nowadays. One of the application is track your vehicle and keeps regular safety monitoring of them. This application monitoring is inform you that location and which route travel by that, and this information is absorbed from any other remote location.

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INTRODUCTION

The Global Positioning System (GPS) is a space-based satellite navigation system that provides location and time information in all type of weather condition, track your vehicle anywhere and near the earth where there is an unobstructed line of sight to four or more in GPS .the tracking system provides the critical conations the military, civil, any commercials user around the world. The United State Government to create and track the vehicle and matins for freely any one can accessible it to anyone can possibly use GPS receiver. The Wirelesstechnology ZigBee is developed as an open global standard to address the unique it needs low cost and low cost of m2m network. This ZigBee is standards by the IEEE and it is physical ratio signal is 802.15.4 specification and it operates bands are 2.4GHz, 900 MHz, and 868 MHz

Vibration sensors are utilized in a number of applications to measure acceleration and or vibrational activity of anyvehicle. All vibration sensors are monitoring the devise working properly this vibration sensors are monitoring the vehicle all rotating machines, and it monitoring the vehicle heating and the over excessive vibration from the vehicle, and it indicates the loads, bearing the weal .like this sensors are geographical combustion engine and in order to engine is operating properly on this vehicle.

Vibration sensors are used as knock sensors in internal combustion engines. In order to assure that an engine is operating under the optimum conditions, and it is 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 device is attached, touched, or vibrated.

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 ZigBee the proposed system diagram is shown below. The vehicle section module consists of Microcontroller, GPS module, vibrating sensor, LCD. ZigBee module and a car lock system. Whenever a collision is occurred the vibrating sensor ON and it will activate the GPS system. Simultaneously the ZigBee module will send message to nearby traffic control police station. This message iscontains the location and vehicle owner details. This application is used to trace the vehicle and where the accident it happen any other issues to track the device where it located. Google earth is used to locate the GPS device at each vehicle. This

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device at very low cost and it is easy to access efficient.

In exiting system depending only on camera video footage for tracking the vehicle which vehicle to made accident. But the existing system is not find the accident happen in night time. And one of the major drawback is limited areas only services is a viable. Theexisting system is not track the device if which vehicleishappen accidentat regular monitoring.

1.1 Advantages:

- when and where ever hit will happen monitoring and track the devise send the location to be sever and all data is stored under the database.When both car hits, while that time the ZigBee acts that send the current location id as IP and vehicle number to the server.
- ZigBee is receives unnecessary data are monitoring and it deleted from the data base.

2. *Literature survey:*

A literature review is an evaluative report of information found in the literature to relateto definition of area related to study. The paper should describe, summaries by the literature survey. It should be given theatrical base to help the natural way to research.The paper work is unrelated should be discarded and those which are peripheral should be looked at critically.

The motivation of this research is to show that visual based object tracking and following is reliable using a cheap GPS-denied multirotor platform such as the architecture is allows the user to specify an object in the image that the robot has to follow from an approximate vehicle distance. At stage of current development of this device image tracking even the system starts to hover and waits for the image tracking recovery or odometer is the second detection for self-stabilization. Our software task is following utilizes the forward-facing camera images and part of the IMU data to calculate the references for the four on-board low-level control on all looping device. To obtain a strong rejection disturbance an improved the navigation performance and heating reference data is internally kept and updated by our control loop algorithm. We are using validate the architecture is AR Drone 2.0 and the Open TLD tracker in outdoor suburban areas. In this paper to back up security option send all data to the owner and the emergency like us police. All data communicated by the ZigBee network.

3. Our proposal:

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 ZigBee the proposed system diagram is shown below. The vehicle section module consists of Microcontroller, GPS module, vibrating sensor, LCD. ZigBee module and a car lock system. Whenever a collision is occurred the vibrating sensor ON and it will activate the GPS system. Simultaneously the ZigBee module 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.

3.1 Architecture Overview:

The Unified Modeling Language (UML) is a general-purpose modeling language in the field of stranded by software engineer. Way to visualize the design of a system. In this Architecture diagram we are seen about the hit and run vehicle how it is perform

In this diagram, Hit-and-run is the act of causing (or contributing to) a traffic accident (such as colliding with a person and or a fixed), the data is filling and stop the rewrite and duplicate data. It is considered a crime in most jurisdictions. In many jurisdictions there may be an additional obligation to exchange information about one's financial responsibility (including any applicable insurance) or to summon emergency services if they needed to be send .they also requirement to leave note containing pertinent information if the property owner is not present.

a) Simple Control Loop:

This micro control loop is simple basic architecture loop. The loop subroutine contains lock system, ZigBee, vibration sensor, and LCD indicator.

b) Interrupt Controlled System:

Some embedded systems are predominantly controlled system. Task are performed triggered by different kinds of events controls the interrupt controlled system.Forexample, the timer in predefine frequency or by a serial port controller receiving a byte. Interrupt controlled systems are used simple and event handler. The interrupt controlled system are run as simple task and in a main loop also, but this task is not very sensitive to unexpected delays.

Sometimes the interrupt handler will add longer tasks to a queue structure unit. After the interrupt controller is finished, main loop is executed the all the tasks. In this method of system prinks the system to multitasking. Vehicular accident reconstruction is the scientific process of analysis, investigating to draw conclusion the causes and events during a vehicle collision. Reconstructionist are employed to

conduct in-depth collision analysis and reconstruction to identify the collision causation and contributing factors in different types of collisions, including the role of the driver(s), vehicle(s), roadway and the environment. The basic engineering principles and low of physics based on work energy , kinematic, linear moment are the basis for these analysis and may make use of software to calculate useful quantities

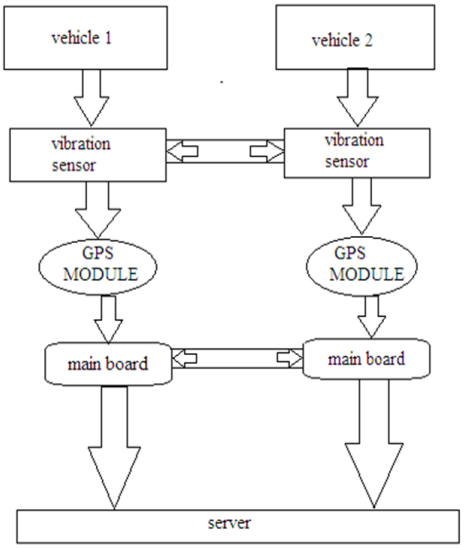

Fig. 3.1: Architecture Diagram.

3.2Control Unit Structure:

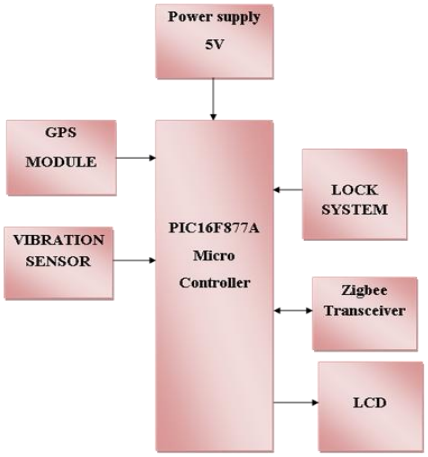

Fig. 3.2: Control Unit Structure.

The Unified Modeling Language (UML) is a type of static structure. That describes the structure of a system by showing the system's classes, their attributes, and operationsrelative among the objects.

4. Prototype implementation andvalidation:

To test the correctness of the proposed system design prototype was build using low cost. The measurement of the system capacity is measured the control unit and generate service estimations from the collected data.

4.1 ZigBee Physical Layer:

ZigBee is a wireless technology developed as an open global standard to address the unique and it is low cost, low power wireless m2m network. TheZigBee is operates on 802.15.4 radio specification and operates in unlicensed bands are 2.4 GHz, 900 MHz and 868 MHz's.

The 802.15.4 specification upon which the ZigBee stack operates gained ratification by the Institute of Electrical and Electronic Engineering.Radio type is packet based specifies low cost, battery operated devices. The protocol allows devices to communicate in a variety of network topologies and can have battery life lasting several years.

4.2 The ZigBee Protocol:

ZigBee protocol has been created and ratifies by many companies of the ZigBee alliance. There are

many leading companies are manufacturers semiconductor, and manufacture technology firms, OEMs and service companies are alliance mempership.the ZigBee protocol was design to provide secure reliable characterized by wireless network architecture.

4.3The ZigBee Advantage:

The ZigBee protocol is designed to communicate data through hostile RF environments that are common in commercial and industrial applications.

4.4 ZigBee protocol features include:

- Support for multiple network topologies as point-to-point, point-to-multipoint and mesh networks.
- Low duty cycle – provides long battery life and Low latency
- Direct Sequence Spread Spectrum (DSSS)
- Up to 65,000 nodes per network
- 128-bit AES encryption is secure data connection.Collision avoidance, retries and acknowledgements

4.5 Mesh Networks:

A key component of the ZigBee protocol is the ability to support mesh network. In this mesh network, all the nodes are interconnected with other nodes so that multiple pathways connect to each node. Connections between these nodes are dynamically updated and optimized through built in mesh routing table and it sophisticated.

Mesh networks are decentralized in nature; each node is capable of self-discovery on the network. Also, as nodes to leave the network, the mesh topology nodes allow to to reconfigure routing paths based on the new structure of network and characterized of mesh topology network is ad-hoc routing provide greater stability in changing conditions or failure at single nodes.

4.6ZigBee Applications:

ZigBee enables broad-based deployment of wireless with low cost and low power consumption. It the ability to run for years on inexpensive batteries for a host of monitoring and control applications. Smart energy/smart grid, AMR, light control, building automation, tank control, HVAC control and medical devices application systemarejust some of the many spaces where ZigBee technology is making significant advancements.

4.7 Digi ZigBee Technology:

Digi is a member of the ZigBee Alliance and has developed a wide range of networking solutions based on the ZigBee protocol. XBee and XBee-PRO models and XBee-enabled devices provide an easy-to-implement solution that provides functionality to connect to a wide variety of devices.

Result Overview:

Vibration Sensor:

Vibration sensors are utilized in a number of applications to measure acceleration and activity of vibration. Vibration sensors can be utilized to determine whether the machinery is operates properly. Sensors are monitoring the condition of rotating machinery, the vehicle where overheating or excessive vibration are could indicate that excessive load, inadequate lubrication, or bearing. Sensors such us 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, it is 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 vibrate. And all vibration sensors are mostly 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 are used for detecting vibration from various vibration sources are generally classified into two large types, resonant type and nonresident 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.

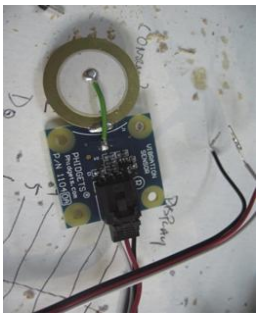

Fig. 5: Vibration sensor.

5.1 Global Positioning System:

The Global Positioning System (GPS) is a space-based global navigation satellite system that provides reliable location and time information in all weather and at all times and anywhere on or near the Earth when and where there is an unobstructed line of sight to four or more GPS satellites.

5.2 GPS:

A GPS receiver calculates its position by precisely timing the signals sent by GPS to satellites its high above the Earth. Each satellite connectivity transmits messages that may include that time the message was transmitted precise orbital information (the ephemeris) the general system health and rough orbits of all GPS satellites (the almanac).

The receiver utilizes the messages it receives to determine the transit time of each message and computes the distance to each satellite. The distances along with the satellitesis locations are used with the possible aid of starvation, depends on which algorithm is used to compute the distance of the receiver. And the position is displayed under with a location with moving map and longitude; elevation information may be include. Many units are monitoring the GPS device to calculate the speed and change position, calculated from position changes.

6. Modules over View:

6.1 User/Driver:

If the User/ Driver has to communicate with the server and avoid the accident, they have to create an account with the server. To create an account with the server, the user has to provide their details like username, password, date of birth, mobile number, and other vehicle information. All this information is stored in the server for future purpose.

6.2 Server:

A server is a computer program running to serve the requests of other programs, the "clients". Thus, the "server" performs some computational task on behalf of "clients". The clients either run on the same computer or connect through the network.

Here the server will store all the user's information in the database. In the server, the detection sensor are connected, so that they can control the vehicles. Also the server will monitor all the user access. The server will also store the user access details in the database.

6.3 Over Speed Control:

Conventional elevator safety equipment includes an over speed governor for impeding elevator car movement when a predetermined speed is exceeded. An over speed controller is an elevator device which acts as a stop device in case the elevator runs beyond the rated speed.

When the vehicle is going in the road, the speed detection sensor will monitor that vehicle. If that Vehicle goes above the specified limit, a signal will be passed to the server via Speed detection sensor, so that the administrator in the server will reduce and control the vehicle's speed. So that we can avoid the over speed of the vehicles.

6.4 Alchohol Detection:

When the driver is driving the vehicle with alcohol consumption, alcohol sensor will sensor and passes the signal to the server. So that the server can control the vehicle and they will not be allowed to drive the vehicle above the certain speed. So that we can avoid the drunk and drive accidents.

The main unit of this project is an "Alcohol sensor". If the person inside car has consumed alcohol then it is detected by the sensor. Sensor gives this signal to a comparator IC. The output of comparator is connected to the microcontroller. Microcontroller is the heart of this project. It is the CPU of the complete circuit. Microcontroller gives alert to the server.

Main advantage of this Alcohol Detection System in Cars provides an automatic safety system for cars and other vehicles as well.

6.5 Mobile Detection:

Mobile phone sensor's is used to determine if the user is the driver or a passenger in an automobile. The system helps the mobile device's identify the user's available attention and focus, enabling it to control delivery of potentially interrupting events such as incoming calls and message

In this module, we can detect the drivers who all are speaking in their mobile while driving. We use Mobile detection sensor to detect the speakers. We attach mobile detection sensor in the vehicle so that, the sensor will sense and pass the signal to the server. Once the server received the information, the server will control the vehicle within the limited speed.

6.6 Eye Wink Sensor:

This module involves controlling accident due to unconscious through Eye blink. Here one eye wink sensor is fixed in vehicle where if anybody loses conscious means it indicates to the server.

6.7 Sms Generation:

If any of the above mentioned detections are activated means the information is sent to the server. Then the server will check the driver's relation and friend number from the database and sent the SMS alert to the mobile numbers.

7. Related Work:

7.1 ZigBeeTran's receiver:

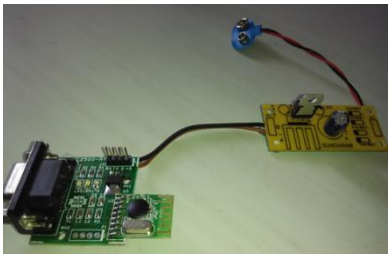

Fig. 7.1: ZigBee Tran's receiver.

ZigBee is a wireless technology developed as an open global standard to address the unique needs of low-cost, low-power wireless M2M networks. The ZigBee standard operates on the IEEE 802.15.4 physical radio specification and operates in unlicensed bands including 2.4 GHz, 900 MHz and 868 MHz

7.2 Vibration Sensor:

Vibration sensors are utilized in a number of applications to measure acceleration and vibrational activity. Vibration sensors can be utilized to control determine whether the machinery is operating properly. Vibration sensors can be useful for monitoring the condition of moving machinery, where overheating or excessive vibration could be indicate excessive loading, inadequate lubrication, or bearing.

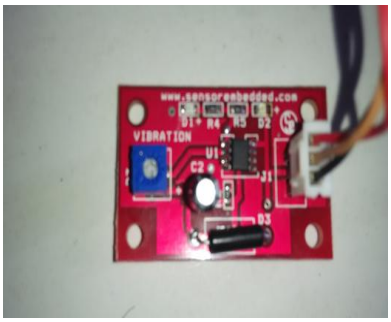

Fig. 7.2: Vibration Sensor.

7.3 Display Circuit Board:

We are using this board for displaying the result. The MAX232 is an integrated circuit that converts signals from an RS-232 serial port to signals suitable for use in TTL compatible digital logic circuits. The MAX232 is a dual driver and receiver and typically converts the RX, TX, CTS and RTS signals. The drivers provide RS-232 voltage level outputs (approx. ± 7.5 V) from a single + 5 V supply via on-chip charge pumps and external capacitors. This makes it useful for implementing RS-232 in devices that otherwise do not need any voltages outside the 0 V to + 5 V range, as power supply design does not need to be made more complicated just for driving the RS-232 in this case.

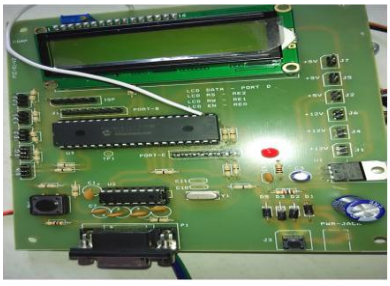

Fig. 7.3: Display Circuit Board.

7.4 GPS:

In this project, we are using GPS for tracking the location of the vehicle. So, we can find out the location of vehicle that what happened to the vehicle. That the GPS connects to the server that responds to the user for user's problems.

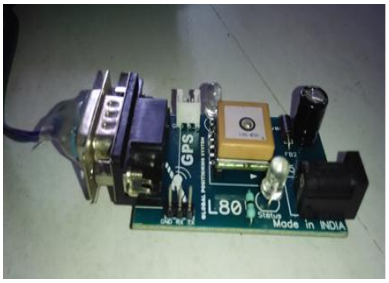

Fig. 7.4: GPS Sensor.

Conclusion:

Till today hit and run cases become unsolved because we cannot find out the hit and run vehicle unless we note down the vehicle details but today with my project we can identify the hit and run vehicle very easily. In previous cases that the hit and run vehicle that cannot be find it very easily, but now by this implementation of project we could find any type of vehicle at any time, at any moment also. This project helps to find out the vehicle which one is hit and it takes the further process for track the vehicle. Vibration sensor sensitivity is increased in future and then the quality of the board are improved by high definition and also in future Subscriber Identity Module for a mobile phone module are used for sending the message to the driver or owner of the vehicle. So that can notice the problem of person at a time and can solve the problem by sending this message to the owner can know the truth of the current status and current location of vehical.so that any kind of emergency help can possible.

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This work is partially developed and supported by ourcollege. we work to give good result and more efficiency. All function of this device is workingproperly. This application gives more safety for all vehicles.

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