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IOT BASED AUTOMATIC VEHICLE ACCIDENT TRACKING DOWN AND SALVAGE SYSTEM USING GSM

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Abstract - *Now a day, technology rapidly growth, but also people do not survive his/her life after road accident . Because there is no emergency facilities available in our country . So we design a technology which facilitates the emergency facility . This project inform about an accident that is occurred to vehicle to rescue team and family members of the travelling persons . It uses MEMS sensor which can detect the abrupt vibration when an accident is occurred and also used ultrasonic sensors for distance calculation*.

Key Words: **Accident detect, Hidden Markov model, occlusion, spatio -temporal Markov random field, tracking**

1. INTRODUCTION

The development in the field of automobiles is highly increasing and which leads to the accidents and so many hazards due to traffic. People's life are under high risk. This situation prevails, just because there is a lack of emergency facilities in our country. In our country, many people loose their life with accidents. Because of causalities or improper communication to rescue team. We are in the process of solving this issue by proposing an efficient solution and to reduce the loss of lives as much as possible. In our theory, the design of the system help us to detect accidents in significantly less time and transfer the fundamental informations to the first aid centre within a few seconds covering the geographical coordinates, the time and the angle where the vehicle had met with an accident. This alert message is sent to the rescue team(ambulance) and the family within the short period. This real time application saves many valuable lives .The message is sent through the GSM module and the location of the The basic idea is to localize the vehicle system by receiving the real time position of the vehicle through GPS and send the information through GSM module via SMS service with an added feature of GPRS transmission to the monitoring center through usage of internet [M.AL-Rousan, A. R. AI-Ali and K. Darwish et al, 2004]. Using AT89S52, this project has been designed. It used EEPROM to store the phone numbers. accident is detected with the help of the GPS module. The accident can be detected precisely with the help of both Micro electro mechanical system (MEMS) sensor and vibration sensor. The Angle of the rolls over of the car can also be known by the message through the MEMS sensor. This application provides the optimum solution to poor emergency facilities provided to the roads accidents in the most feasible way.

1.1 EXISTING SYSTEM

The existing system only use the information about the distance between the two vehicles provided by the ultrasonic system and does not need to explicitly knows the speed. The advent 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. This drawback can be overcome by proposed system.

Disadvantage:

- It has low reliability
- Poor control system

1.2 PROPOSED SYSTEM

Our project work on the principle of detection and tracking of accident. The system is on and initialization. If vehicle is normal, no information sends to rescue team. Whenever accident occurred, the vehicle changes it's direction randomly and vibrates with high frequency .The MEMS sensor detects the happening with vehicle. The controller get the input from sensor and send the accident alert information to rescue team and family member and location of the accident place through WIFI and GPS .It can facilitate connectivity to the nearest hospital and provide medical assistance through IOT technology.

Advantage:

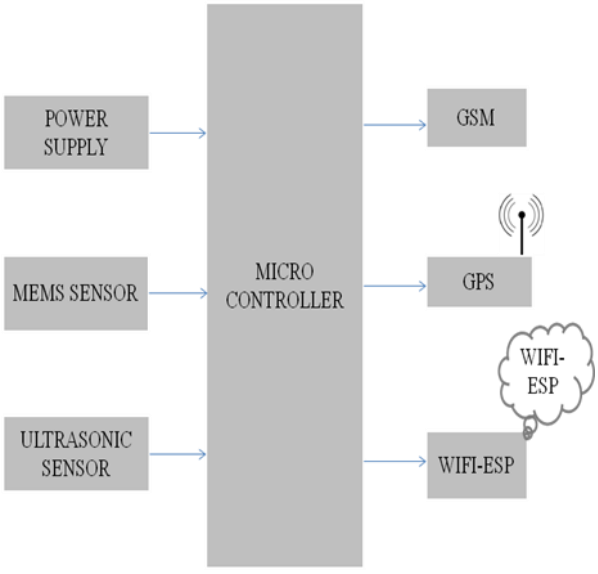
- Sophisticated security.
- Monitors all hazards and threats.
- Wireless monitoring and user friendly

2. LITERATURE SURVEY

At present criteria, we cannot detect where the accident has occurred and hence no information related to it, leading to the death of an individual. The research work is going on for tracking of the vehicle even in dark clumsy areas where there is no network for receiving the signals. In literature, a

number of approaches to provide security and safety through monitoring the vehicle's real time precise positioning and information using different tech- nologies have been proposed. A good survey of using GPS, GSM and GIS has been provided in [IoanLita, Ion BogdanCioc, Daniel AlexandruVisan et al, 2006] and [Mrs. RamyaKulandaivel, P.Ponmalar, B.Geetha, G.Saranya et al, 2012]. The general mechanism is to provide the real time geograph- ical position of a vehicle using GPS receiver and send this information to GSM center through configurable software, this is all done by the monitoring center which is working as a control unit that is connected not only by an optical cable but also connected wirelessly through TCP/IP protocols. The monitoring center distributes the data to the client in an understandable format and it also stores the travelling records and displays the real time information about vehicle on electronic map through GIS system [IoanLita, Ion BogdanCioc, Daniel AlexandruVisan et al, 2006]. Another approach is that vehicle terminal includes a GPS receiver which extracts information about position through GPS satellites and sends it through GSM network and to the control center which reads.

3. BLOCK DIAGRAM



4. Working of Automatic vehicle accident detection:

Step1: Initially, the MEMS sensor is kept in one direction ie, indicating that the vehicle is safe.

Step2: The kit is powered up by the energy from engines located in the vehicles.

Step3:when an accident occurred, the angle or direction of the MEMS sensor changes. These changes are consider to be an input and the process starts.

Step4:The GPS locates the exact position of the vehicle in accordance with the latitude and longitude .

Step5:These values are initially read in0's and 1's by the circuit and then converted to normal value.

Step6:The bridge rectifier is used in order tofilter the input voltage and also step down transformer is used.

Step7: Here we use GSM that sends the emergency message.

Step8: The SIM is fitted and an emergency message consisting of the location (google map) is been sent to family and rescue team.

5. OPERATING PROCEDURE:

5.1 MICROCONTROLLER:

It gets information from sensor and process on it. It compares the received data with the threshold level set and accordingly output is generated. The LPC131/32/34//38 microcontrollers are based on a 16/32-bit ARM7TDMI-S CPU with concurrent emulation and entrenched outline holdup, that unite the microcontroller with 32KB, 64KB, 128KB, 256KB and 512KB of entrenched.

5.2 WI-FI MODEM:

This unit is authoritative enough onboard processing and storage capability that allows it to be integrated with the sensors and other application explicit devices through its GPIOs with minimal development upfront and minimal loading during runtime. Its high degree of on-chip integration allows for minimal external circuitry, including the frontend module, is designed to occupy minimal PCB area. The ESP8266 provisions APSD for VoIP claims and Bluetooth co-existence confines, it comprises a self-calibrated RF leasing it to vocation beneath all operational conditions, and involves no peripheral RF parts. There is an approximately immeasurable spray of in sequence accessible for the ESP8266, all of which has been provided by amazing community support.

5.3 POWERSUPPLY:

Computer power supply

A modern computer power supply is a switch-mode power supply that converts AC power from the mains supply, to several DC voltages. Switch-mode supplies replaced linear supplies due to cost, weight, and size

improvement. The diverse collection of output voltages also has widely varying current draw requirements.

Electric Vehicle power supply

Vehicle is those which rely on energy created through electricity generation. A power supply unit is part of the necessary design to convert high voltage vehicle battery power.

5.4 MEMS SENSOR:

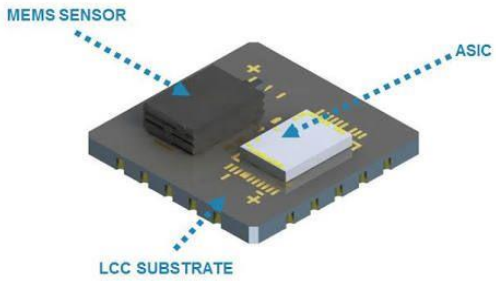
MEMS are constructed on one chip with electrical circuitry for inputs and outputs of the electromechanical components.

Poly silicon springs suspend the MEMS structure above the substrate such that the body of the sensor (also known as the proof mass) can move in the X and Y axes. Acceleration causes deflection of the proof mass from its centre position. Around the four sides of the square proof mass are 32 sets of radial fingers.

These fingers are positioned between plates that are fixed to the substrate. Each finger and pair of fixed plates make up a differential capacitor, and the deflection of the proof mass is determined by measuring the differential capacitance.

This sensing method has the ability of sensing both dynamic acceleration (i.e. shock or vibration) and static acceleration (i.e. inclination or gravity).

The differential capacitance is measured using synchronus modulation/demodulation technique.

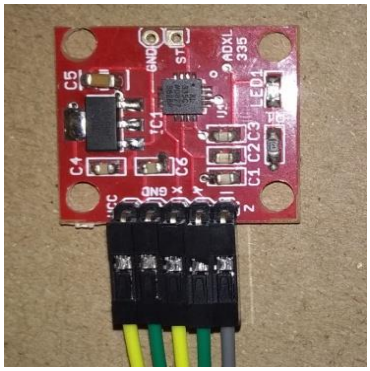


After amplification, the X and Y axis acceleration signals each go through a 32KOhm resistor to an output pin (Cx and Cy) and a duty cycle modulator (the overall architecture can be seen in the block diagram in Figure 3).

The user may limit the bandwidth, and thereby lower the noise floor, by adding a capacitor at the Cx and Cy pin.

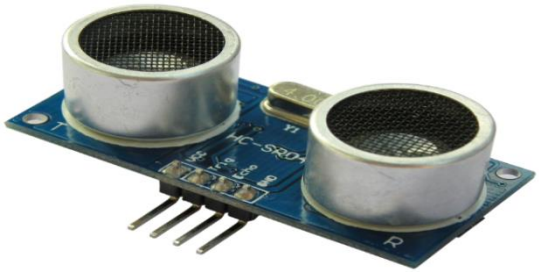
The output signals are voltage proportional to acceleration and pulse-width-modulation (PWM) proportional to acceleration.

Using the PWM outputs, the user can interface the ADXL2O2 directly to the digital inputs of a microcontroller using a counter to decode the PWM

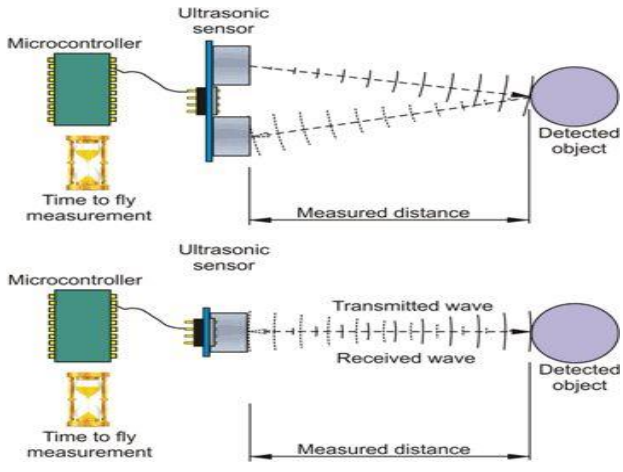


5.5 ULTRASONIC SENSOR:

An ultrasonic sensor transmit ultrasonic waves into the air and detects reflected waves from an object.It provides an easy method of distance measurement. This sensor is perfect for any number of application that requires you to perform measurements between moving on stationary object.A single I/O pin is used to trigger and ultrasonic burst and then ''Listen '' for the echo returns pulse.



In this project,the ultrasonic sensor observes the vibrations that are produced by the nearby objects.Here when accident occurs , the nearby object or another nearby vehicles is been detected and is displayed in the LED display.



5.6 GSM:

GSM network operates in a number of different carrier frequency ranges. The GSM ranges from900MHZ to 2-8GHZ and we use 4G sim for the transformation oh message hence it uses 2-8GHZ frequency range. The frame duration is 4.615ms and 270.833 Kbits/s(half -rate channels).The

subscriber (sim) carries the mobile station and subsystem controls the radio link with mobile station.

5.7 GPS:

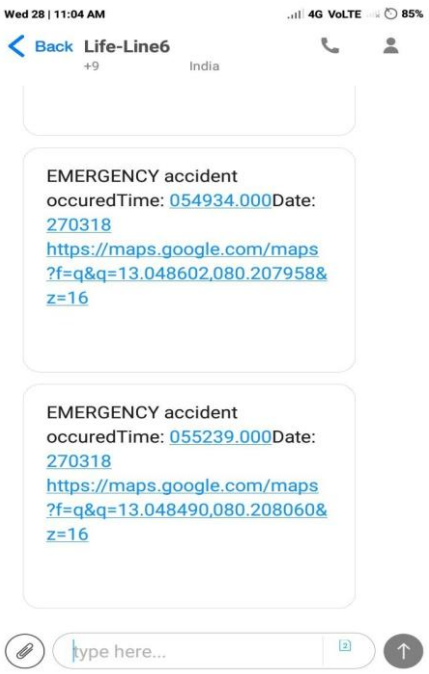
The Global Positioning System is a space based global navigation satellite system (GNSS) that provides reliable location(accident spot) and times anywhere on the globe. The GPS satellites act as a reference point from which receivers on the ground detect their position. The fundamental navigation principle is based on the measurement of pseudo ranges between the user and four satellites.

INPUTS:

POSITION 1: **Vehicle safe**

POSITION 2:Accident occured

OUTPUT:



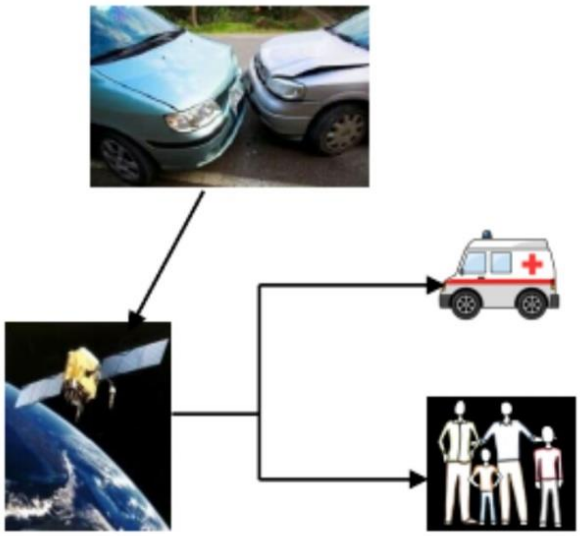
Alert message to the family and the rescue team with exact location of an accident

6. CONCLUSION:

The proposed system uses the IOT for vehicle accident spotting and alarming the authorities regarding accidents, vehicle tracking using GPS modem. In this theory we have designed IOT based vehicle accident detection and tracking system usin GPS modem. Hence IOT can revolutionize the way the system interact and respond for the variety of applications especially incase of traffic control.

ADVANTAGE:

- The exact location of the victim can be identified.
- The information about the accident is being directly sent to the rescue team and family which is a fast process but whereas in previous case the pass by people detect the accident and inform it to the rescue team and family which is a very slow process.



7. Future Scope:

This system can be interface with vehicle airbag system that prevents vehicle occupants from striking interior objects such as the steering wheel or window. This can also be developed by interconnecting a camera to the controller module that takes the photograph of the accident spot that makes the tracking easier.

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