

IOT Based Vehicle Tracking and Accident Detection System

Suryakala N¹, Roopa G², Swaroopa K³, Yogitha M P⁴

U.G. Student, Department of Computer Engineering, Sri Krishna institute of technology, Bangalore, India^{1,2,3,4}

ABSTRACT: Internet of Things (IOT) which basically combination of both hardware and software. It is the network of physical devices, vehicles, home appliances, and software, sensors, which enables these objects to connect and exchange data. The appeal of cars has likewise expanded the activity perils and the street mishaps. Life of the general population is under high hazard. This is a direct result of the absence of best crisis offices accessible in our nation. A programmed alert gadget for vehicle mischances is presented in here. The proposed configuration is a framework which can and sends the essential data to emergency treatment focus inside a couple of moments covering geological directions, the time and point in which a vehicle mishap had happened. This caution message is sent to the safeguard group in a brief span, which will help in sparing the important lives. Switch is likewise given so as to end the sending of a message in uncommon situation where there is no loss, this can spare the valuable time of the medicinal safeguard group.

KEYWORDS: Global Positioning System (GPS), Global System Module (GSM), Amazon web services (AWS), Microcontroller, Cloud Storage, Accelerometer, and Infrared Sensor (IR).

I. INTRODUCTION

Today, the advanced universe of science and innovation, Transportation framework is an essential piece of living. Having this with us gives us the vibe of the generally mingled animals on the planet. Vehicles assume a crucial part in our day by day life yet like each other thing, with a few positives there are negatives as well. Street mischances are the real danger to human lives. Speed is the key factor in charge of a significant number of the incidents. PDA based mischance identification and warning framework will track the mishap with assistance of sent effect sensors, will process the information through microcontroller unit and with a Smartphone application GPS, GSM it will send a notice to the closest crisis benefits and to the casualty's family [1].

Speed is a champion among the hugest reasons for a mischance. These days, GPS beneficiary has turned into a vital piece of a vehicle. Other than utilizing as a part of different purposes, the GPS can likewise screen the speed and distinguish a mishap. It can utilize an extremely modest and well known GSM modem to send the mischance area to the Alert Service Center. It can send the last speed before mishap which will surveys the seriousness of the mishap and can start a voice call. Adjacent to the programmed recognition framework, the vehicle inhabitant will have the capacity to physically send the mishap circumstance by squeezing the Manual Detection Switch. Hence, the proposed framework can serve the mankind by an awesome arrangement as human life is important [3].

A GPS vehicle following and administration framework that gives numerous universal administrations whenever and anyplace. The framework enables individuals to track down their vehicles position, speed, stops, and developments. The checking process incorporates setting speed and geological limits, getting history reports of the vehicle's developments or ongoing following. It can be utilized to avert auto robbery by joining the gadget with the auto alert and furthermore acquiring a guide containing the auto area if the auto is believed to be stolen. Following vehicles in our framework uses an extensive variety of new advancements and correspondence systems counting GPRS, GSM, the Internet, and GPS. For future work, more administrations could be added to the portable application and furthermore the graphical client interface could be moved forward [6].

The outline of vehicle area framework in view of ARM is designed and utilizes the ARM microchip LPC2129 as a control unit to combinative with GPS LR9548 and GSM TC35 modules. Investigates area arrangement, map-matching and information pack that related with the situation, predicts the pattern of the vehicle area framework later on Taking ARM as stage, and GPS and GSM as remote information correspondence stage, Vehicle Positioning System is little, steady and dependable, with little deferral, which can successfully defeat the past detriments of poor ongoing what's more, high working expenses existed in the framework. Vehicle situating framework is attempting to accomplish appearance of situating innovation, coordination of situating frameworks, and system of area based administrations as the current Customer/Serve. It is trusted that the framework will have expansive application prospects [4].

II. LITERATURE SURVEY

KiranSawant et al. created an accident alert system using GSM and GPS modem and Raspberry Pi. A piezoelectric sensor first senses the occurrence of an accident and gives its output to the microcontroller. The GPS detects the latitude and longitudinal position of a vehicle. The latitudes and longitude position of the vehicle is sent as message through the GSM. The static IP address of central emergency dispatch server is pre-saved in the EEPROM. Whenever an accident has occurred the position is detected and a message has been sent to the pre-saved static IP address [1].

Mrs. ManasiPatil et al. described a better traffic management system using Raspberry pi and RFID technology. The vehicle has a raspberry pi controller fixed in it which is interfaced with sensors like gas sensor, temperature sensor and shock sensor. These sensors are fixed at a predetermined value before accident. When an accident occurs the value of one of the sensor changes and a message to a predefined number (of the ambulance) is sent through GSM. The GPS module which is also interfaced with the controller also sends the location of the vehicle. When the message is received by the ambulance, a clear route has to be provided to the ambulance. The ambulance has a controller ARM which is interfaced with the RFID tag sends electromagnetic waves. When an ambulance reaches the traffic signal the RFID reader which is placed on the joints detect the electromagnetic waves of the tag. If the traffic signal is red, then the readers goes through the database in fraction of seconds and turn the red light green. And automatically in such condition the RFID on opposite joints turn the opposite signal red. This provides a clear route tothe ambulance. [2].

V.Sagar Reddy et al., developed an accelerometer based System for driver safety. The system has the advantage of tracking or identifying vehicles location just by sending a SMS or email to the authorized person. The system is designed by using Raspberry Pi (ARM11) for fast access to accelerometer for event detection. Is there any event is occurs the message sent to the authorized person so they can take immediate action to save the lives and reduce the damages. Images captured by the camera on the vehicle are emailed to the concerned person (for example the owner of the vehicle) along with the type of accident and the time of theaccident. [3].

Sri Krishna ChaitanyaVarma et al., proposed an Automatic Vehicle Accident Detection and Messaging System Using GPS and GSM Modems. AT89C52 microcontroller is used in the system. When the system is switched on, LED is ON indicating that power is supplied to the circuit. When the IR sensors that are used sense any obstacle, they send interrupt to microcontroller. The GPS receives the location of the vehicle that met with an accident and gives the information back. This information is sent to a mobile number as a message. This message is received using GSM modem present in the circuit. The message gives the information of longitude and latitude values. Using these values the position of the vehicle can be estimated [4].

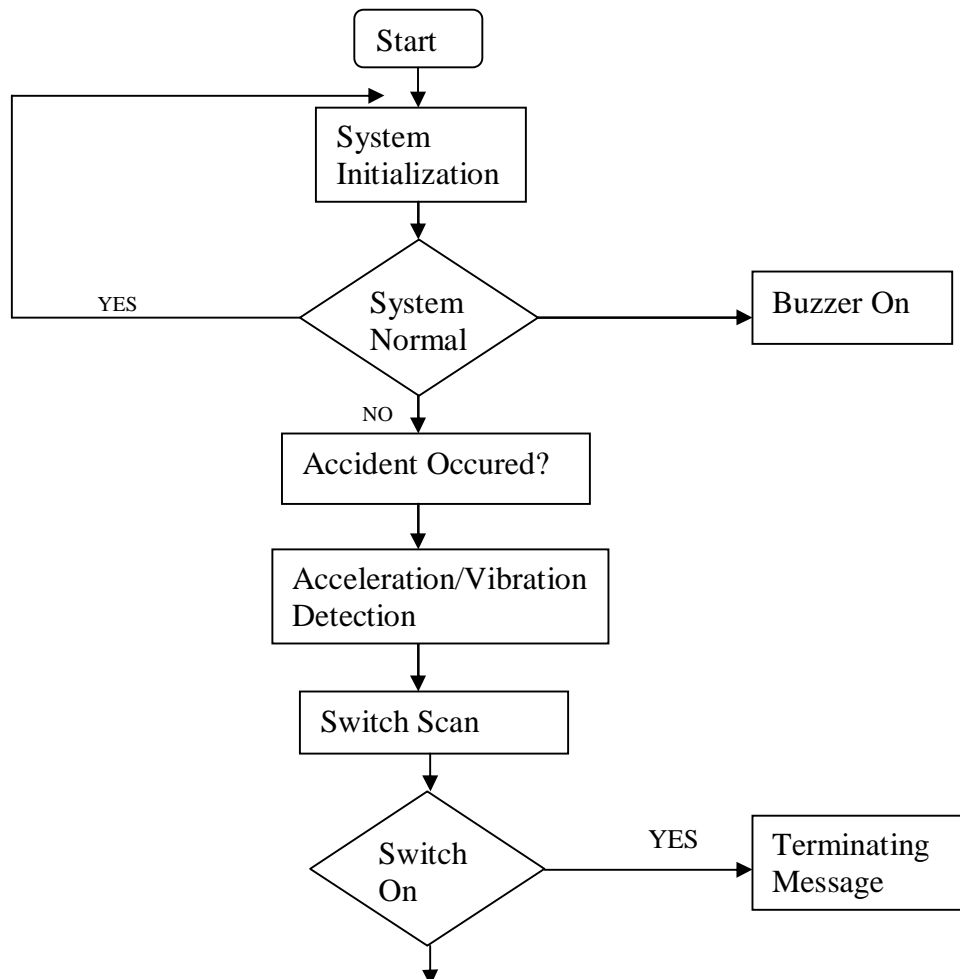
Apurva Mane et al., described the methods for vehicle collision detection and remote alarm device using Arduino. Key features of this design include real-time vehicle monitoring by sending its information regarding position (longitude, latitude), time, and angle to the monitoring station and to the user/owners mobile that should help them to get medical help if accident or the theft occurs. Also user/owner has an access to get real- time position of a vehicle in real time. Whenever accident occurs MEMS and vibration sensor detects and sends the signals to microcontroller, by using GPS particular locations where accident has occurred is found, then GSM sends message to authorized members[5]

Prof. Mrs. Bhagya Lakshmi V et al. proposed a FPGA Based Vehicle Tracking and Accident Warning system using GPS. FPGA is mainly used to track position of any vehicle and send automated message to preprogrammed number. The owner of vehicle, police to clear traffic, ambulance to save people can be informed by this device. FPGA controls and co-ordinate all parts used in system. With the help of accelerometer sensor, the exact position of the vehicle can be detected. It can also be predicted whether the vehicle is in normal position or upside down [6].

III. DATA FLOW DIAGRAM

The Flow Chart of the system is shown in the figure 1.

- It shows the system is initialized on power ON.
- When the system is detected to be abnormal, it is confirmed that the accident has occurred.
- The sensors of the vehicle are detected to confirm the cause of the accident. As soon as the accident is detected the buzzer (alarm) is ON.
- The switch is scanned first; if it is a minor accident then the switch is ON so that messaging is terminated.
- If it is a major accident, the switch remains OFF and the message with GPS co- ordinates and vehicle number is sent automatically to the cloud
- And an algorithm is written in the in such a way that SMS will be sent to nearest hospital to provide ambulance service at the earliest and SMS will be sent to the family people about the accident.



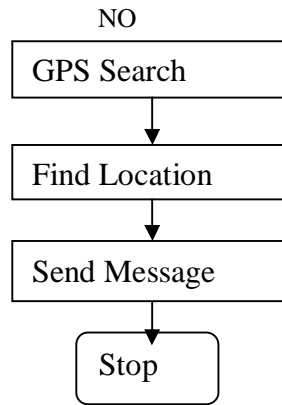


Fig 1: Flowchart of the System

IV. SYSTEM ARCHITECTURE

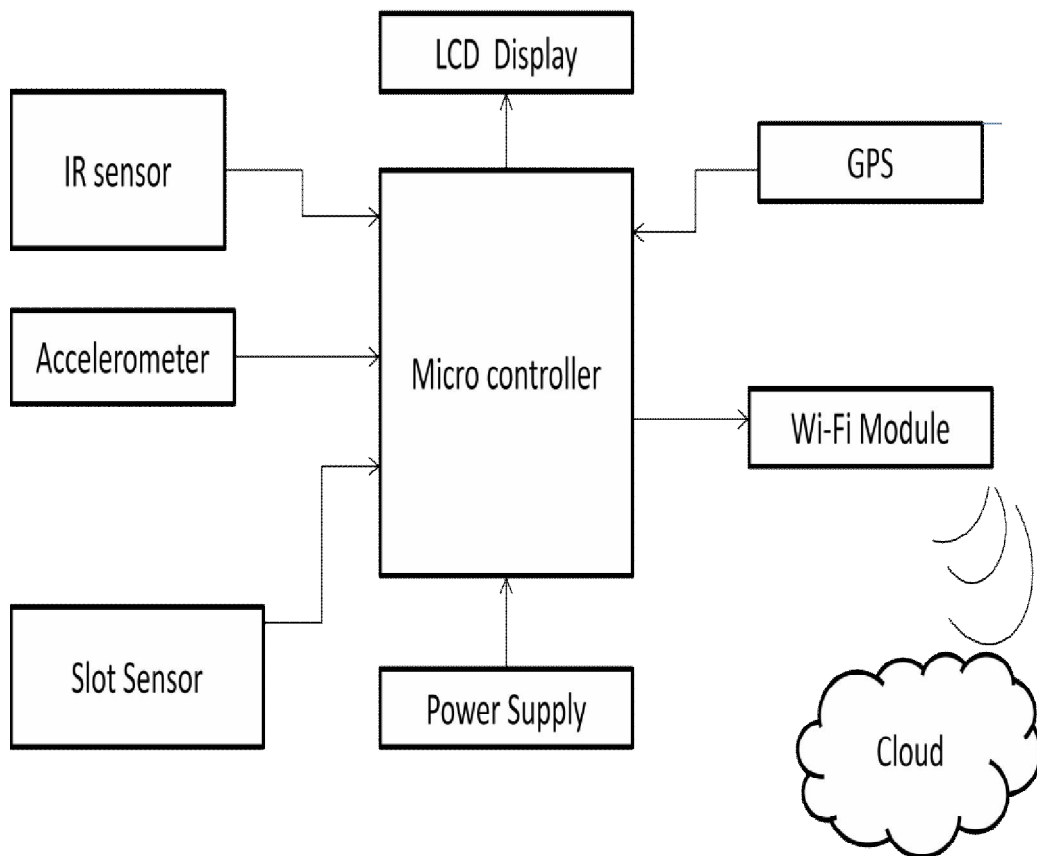


Fig 2: Architecture System Block Diagram

System diagram as shown below in figure1 consists of different components like *Accelerometer*, *IR sensor*, *Microcontroller*, *LCD Display*, *Global Positioning System (GPS)*, *Wi-Fi Module*, *Power Supply*, *Slot Sensor*, *Cloud Storage*. All the components are connected to one central processing unit i.e., microcontroller where it is a central component and controls and co-ordinates the other components connected to it. Wi-Fi Module is used for wireless transfer of messages where a message is generated by Global System Module (GSM) by using the specific template module.

Accelerometer: An accelerometer is a gadget that measures changes in gravitational increasing speed in a gadget it might be introduced in. Accelerometers are utilized to quantify increasing speed, tilt and vibration in various gadgets. Accelerometers that utilization the piezoelectric impact measures a little voltage change.

Cloud Storage: Distributed storage is a model of information stockpiling in which the advanced information is put away in coherent pools, the physical stockpiling traverses various servers (and frequently areas), and the physical condition is ordinarily claimed and overseen by a facilitating organization. These distributed storage suppliers are in charge of keeping the information accessible and open, and the physical condition secured and running. Individuals and associations purchase or rent stockpiling limit from the suppliers to store client, association, or application information.

IR sensor: An infrared sensor is an electronic instrument which is utilized to detect certain qualities of its surroundings by either emanating as well as distinguishing infrared radiation. Infrared sensors are likewise fit for estimating the warmth being produced by a question and identifying movement. Infrared Radiation.

Microcontroller: A microcontroller (or MCU for microcontroller unit) is a little PC on a solitary coordinated circuit. In present day phrasing, it is like, however less modern than, a framework on a chip or SoC; a SoC may incorporate a microcontroller as one of its parts. A microcontroller contains at least one CPUs (processor centres) alongside memory and programmable information/yield peripherals. Program memory as ferroelectric RAMS, NOR blaze or OTP ROM is likewise regularly included on chip, and in addition a little measure of RAM.

LCD Display: LCD (liquid crystal display) is the technology used for displays in notebook and other smaller computers. Like light-emitting diode (LED) and gas-plasma technologies, LCDs allow displays to be much thinner than cathode ray tube (CRT) technology.

Global Positioning System (GPS): It is a space-based wireless steering scheme. GPS notion is founded on interval and identified location of GPS focused outposts. The outposts bring actual steady nuclear timers that are corresponding with one extra and with the pounded timers. GPS out posts always diffuse data about their present interval and location.

Wi-Fi Module: Wi-Fi is the term of a wide spread wireless schmoozing skill that uses wireless rollers to offer wireless high-speed internet and net associates. A mutual misreading is that the term Wi-Fi is short for "Wireless Fidelity".

Power Supply: Is an electrical device that provisions electrical rule to an electrical load. The primary job of a power supply is to alter electric current from a source to the correct voltage, current, and frequency to power the load.

Slot Sensor: It is sometimes called optical fork sensors because of their "forked" shape; detect objects that pass between the two arms –one with the emitter, the other with the receiver.

V. CONCLUSION

Henceforth the fright system for agent contingencies has been instigated using one-chip computer. The button provides the passenger to escape fabricated fright of agent and appeal for the primary assistance. The Google maps boundary sorts the inspecting of the position at ease. The key benefits of this scheme exist first of all, decreases human interpolation by the notion of Internet of Things (IOT). Furthermore, it agrees things to be recognized or skilful remotely across existing network organisation. Lastly, increase in competence, exactness and profitable aids.

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