An Intelligent Application for Vehicle Tracking System using IoT

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ABSTRACT

Transportation has great importance in our daily life and it's development has made many of our chores much easy. 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. IoT based vehicle accident detection system using GPS and WIFI has gained attention. When accident occurs, this system sends short message to WhatsApp of a mobile number via Wi-Fi over internet. Message will give longitude and latitude values. From these values location of accident can be determined. The internet of things (IoT) may provide satisfactory and good results in our work by relying on a mixture of software and hardware, which is in the overall interest of the project. The aim of using IoT for tracking and monitoring is due to the great advantages that provide when working with its components. The developed system takes care of vehicles and s driver's safety.

I. INTRODUCTION

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]. Vehicle tracking systems are popular among people as a retrieval device and theft prevention. The main benefit of vehicle tracking systems is the security purposes by monitoring the vehicle's location which can be used as a protection approach for vehicles that are stolen by sending its position coordinates to the police center as an alert for the stolen. When a police center receives an alert for stolen vehicles, they can make an action to prevent this theft. Nowadays, it is used either as a replacement or addition for car alarms to protect it from theft or it can be used as a monitoring system to keep track the vehicle at the real time. So, many applications can be used for this purpose to block car's engine or doors as an action to protect the vehicle. Due to the advancement in technology vehicle tracking systems that can even identify and detect vehicle's illegal movements and then attentive the owner about these movements. This gives an advantage over the rest applications and other pieces of technology that can serve for the same purpose. Nowadays, vehicle tracking is one of the most important applications. For example, the maps given to vehicle drivers may play a large role in vehicle tracking and monitoring. The major difficulty is that vehicle owners may not be able to distinguish the vehicle in a place as a result of overlapping maps, which adversely affects the process of tracking and

monitoring[1]. The Internet of Things (IoT) is the interconnection of uniquely identifiable embedded computing devices within the existing Internet infrastructure. Typically, IoT offers advanced connectivity of devices, systems, and services that goes beyond machine-to-machine communications (M2M) and covers a variety of protocols, domains, and applications. The interconnection of these embedded devices (including smart objects), is implemented in nearly all fields of automation enabling advanced applications like a Smart Grid.
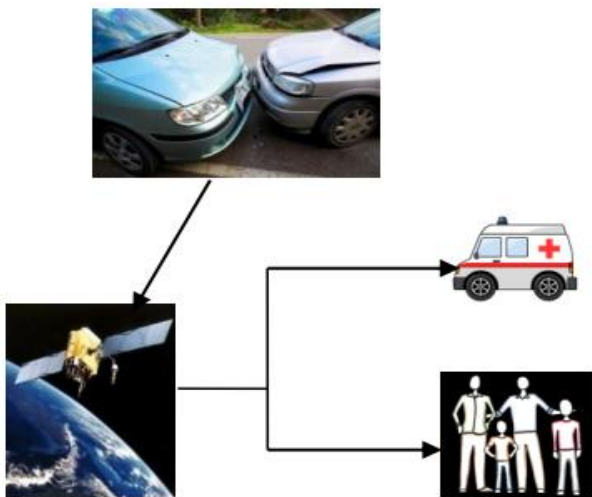
Fig.1: Smart vehicle monitoring using IoT

The term things in the IoT refers to a wide variety of devices such as heart monitoring implants, biochip transponders on farm animals, electric clams in coastal waters, automobiles with built-in sensors, or field operation devices that assist fire-fighters in search and rescue. Current market examples include thermostat systems and washer/dryers that utilize Wi-Fi for remote monitoring. Due to over endure their work or having less rest hours may likewise prompt laziness and because of that the individual who is driving the vehicle may fall a rest or close the eyes for quite a while that may prompts deadly accidents, In few cases the temperature in the motor turns out to be high because of more warmth in the environment or because of loss of coolant these are the most widely recognized issues for the warmth in the engine.

II. LITERATURE SURVEY

Many researchers carried out their studies on accident detection system. Aishwarya S.R expained an IoT based vehicle accident prevention and tracking system for night drivers .In this paper provides Eye Blink Monitoring System (EBM) that alerts the subject during state of drowsiness.[1] Sadhana B have explained Smart helmetintelligent safety for motorcyclist using raspberry pi and open CV. The idea is obtained after knowing that there is increased number of fatal road accidents over the years. This project is designed to introduce safety systems for the motorcyclist to wear the helmet properly.[2] Sarika R. Gujar explained advanced Embedded System of Vehicle Accident Detection and Tracking System. The main objective of this system is to first detect the accident location and call for the emergency services. Vehicle accident detection is possible with the help of sensors. 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]. Accident and the location of the vehicle are detected. By this system primary care is received as the accident information is available Anusha et al[2] implemented a system using LPC2148 and the system has features like

storing in the database. The work includes GPS, GSM modules. The framework also detects Alcohol consumption and Engine Temperature, All the values can be seen on the Web page.so safety is provided to the travelers in the vehicle. Imteaj et al[3] developed an Android-based application that detects an accidental situation and sends an alert message to the nearest police station and medical care center. This application is organized with an external pressure sensor to extract the outward force of the vehicle body.

III. PROPOSED SYSTEM

The block diagram of the proposed system consists of the following components: Raspberry Pi, vibration sensor, GPS Modem, L293D motor drive, led, buzzer, power supply (12v DC). The above components are integrated as per the block diagram given in Fig 1
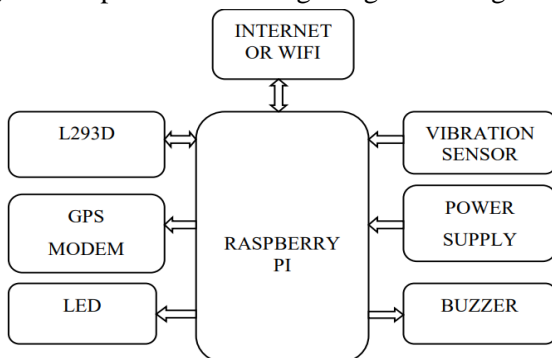

Fig 2: Block diagram of implemented system

Working Principle

In this project we are using a Raspberry Pi3. When the system is switched on, LED will be ON indicating that the power is supplied to the circuit. When the vibration sensor senses any obstacle, they send interrupt to Raspberry Pi. The GPS receives the location of the vehicle that met with an accident and gives the information back. This information will be sent to a mobile number through WhatsApp message. This message will be received using internet present in the circuit. This message will give the information of longitude and latitude values. Using these values the position of the vehicle can be estimated. The received data is given to the Raspberry Pi. Correspondingly it gives an acknowledgement in the form of an WhatsApp

message to the mobile phone. LED used in the circuit displays the reception of messages.

IV. DATA FLOW DIAGRAM

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.
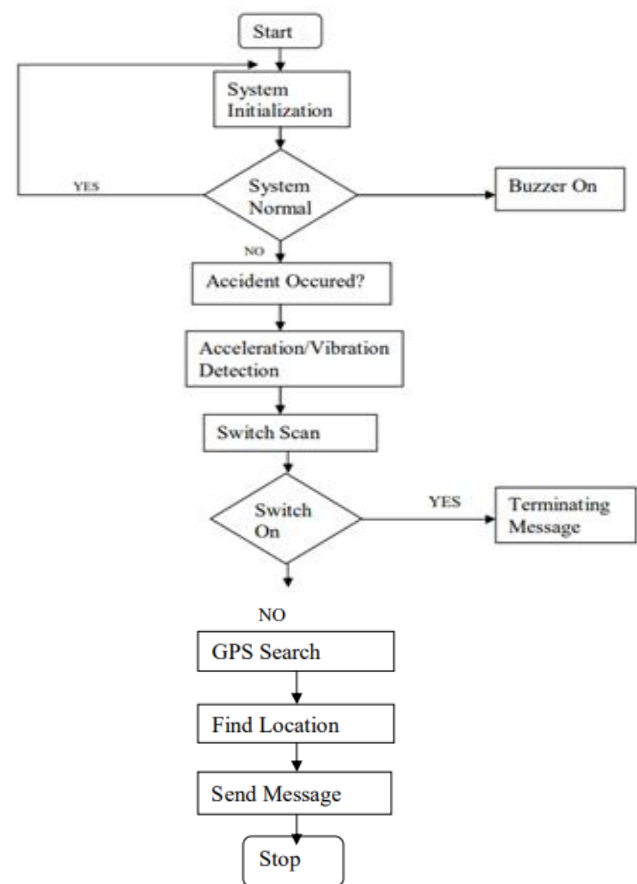

Fig 3: Flowchart of the System

V. ADVANTAGES

- We can monitor the speed of the vehicle.
- We can find the location of the vehicle.
- Alert message to mobile phone for remote information.
- Mobile number can be changed at any time.

VI. APPLICATIONS

Automotive and transport vehicles

Security, remote monitoring and transportation and logistics

This system also can be interfaced with vehicle alerting system.

VII. RESULTS

The Raspberry Pi interfaced to GPS modem via an internet, where the devices are activated using select lines internally built in the internet. Internet is interfaced to Raspberry Pi via transmit and receive pin.LED is interfaced to any ports of Raspberry Pi; it is used to display the current status of the GPS modem, whether data is being read from GPS.
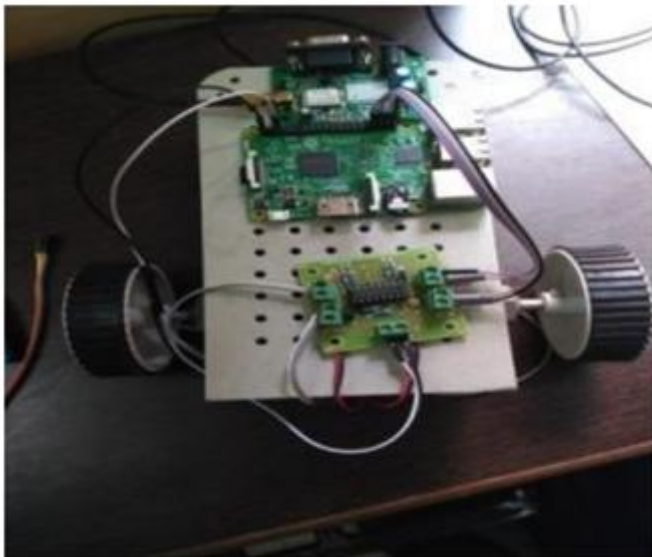
Fig 4: Typical hardware setup of the system

VII. 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 organization. Lastly, increase in competence, exactness and profitable aids. The proposed system uses the IoT for vehicle accident detection and alarming the authorities regarding accidents, vehicle tracking using GPS Modem. In this project we have designed IoT based vehicle accident detection and tracking system using GPS Modem. Hence IoT can revolutionize the way the system interact and respond for the variety of applications especially in case of traffic control.

VIII. FUTURE SCOPE

This system can be interfaced 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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