Abstract

In today’s world highway accident have become a common occurrence. Many people die each year due improper medical care after the accident happen. There is no effective method by which the correct authorities can be informed in time so that the person’s life can be saved. We are designing such a device which will not only detect any accident that happens to the car but also inform the appropriate authorities immediately as soon as the accident occurs. We have attached 8 digital sensors to the µc which are placed at various location of the vehicle. As soon as any accident is detected a pulse is given to µc. The µc then operates a buzzer and sends an emergency SMS (using AT commands) to the concerned persons.

1 Introduction

Now-a-days, it became very difficult to know that an accident has occurred and to locate the position where it has happened. There is no system of identification and intimation regarding an accident in previous. Later on the SMS service begins for intimation purpose. GPS and GSM make the usage for intimation and identification of place. It’s very difficult for the lives of victims until anyone noticed and informed it to the ambulance or to any hospital and if it occurs in remote areas there will be no hope to survive. To overcome these, GSM and GPS technologies are used. The GPS based vehicle accident identification module contains sensors and a GPS modem connected to the microcontroller. When an accident occurs, various sensors give signal to the microcontroller, which sends the
information to android phone through GSM network. The vehicle is tracked for every five minutes using GPS and the position of the vehicle is also sent to the mobile in terms of latitude and longitude.

2 Related Work

Although the first research efforts on developing intelligent vehicles were seen in Japan in the 70’s, significant research activities were triggered in Europe in the late 80s and early 90s. MITI, Nissan and Fujitsu pioneered the research in this area by joining forces in the project “Personal Vehicle System” [1]. In 1996, the Advanced Cruise-Assist Highway System Research Association (AHSRA) was established among automobile industries and a large number of research centers [2]. In the US, great deals of initiatives have been launched to address this problem. In 1995, the US government established the National Automated Highway System Consortium (NAHSC)[3], and launched the Intelligent Vehicle Initiative (IVI) in 1997. Several promising prototype vehicles/systems have been investigated and demonstrated within the last 15 years..

3 The Existing Advance System Found In High End Cars

3.1 ABS (Anti-Locking Braking System):

ABS works with your regular braking system by automatically pumping them. In vehicles not equipped with ABS, the driver has to manually pump the brakes to prevent wheel lockup. In vehicles equipped with ABS, your foot should remain firmly planted on the brake pedal, while ABS pumps the brakes for you so you can concentrate on steering to safety.

3.2 EBD (Electronic brake-force distribution):

Electronic brake-force distribution (EBD or EBFD), Electronic brake-force limitation (EBL) is an automobile brake technology that automatically varies the amount of force applied to each of a vehicle's brakes, based on road conditions, speed, loading, etc. always coupled with anti-lock braking systems.

3.3 SRS Air Bags (Supplemental Restraint System Air Bags):

An airbag is a vehicle safety device. It is an occupant restraint consisting of a flexible envelope designed to inflate rapidly during an automobile collision, to prevent occupants from striking interior objects such as the steering wheel or a window, the sensors may deploy one or more airbags in an impact zone at variable rates based on the type and severity of impact; the airbag is designed to only inflate in moderate to severe frontal crashes.

3.4 Immobilizer:

An immobilizer is an electronic device fitted to an automobile which prevents the engine from running unless the correct key (or other token) is present. This prevents the car from being "hot-wired" after entry has been achieved.

3.5 Parking sensors:

Parking sensors are proximity sensors for road vehicles which can alert the driver to unseen obstacles during parking man oeuvres. Parking sensors generally fall into two categories.

i) Electromagnetic parking sensors.

ii) Ultrasonic parking sensors.

3.6 Cruise Control:

Cruise control (sometimes known as speed control or auto cruise) is a system that automatically controls the speed of a motor vehicle. The system takes over the throttle of the car to maintain a steady speed as set by the driver.
4. Proposed Method

4.1.1 System Architecture

A complete system has been developed for the task of accident detection and tracking. In our system, various sensors are used such as temperature, vibration, proximity and heat sensors etc. When these sensors detect any type of force, it signals the signal conditioner. Analog to digital converter converts this mechanical force to digital data. Then the output of the ADC is given to the microcontroller, which is AT89C51. This information will be sent to android phone using Bluetooth controller.

GPS receiver notes the latitude and longitude through antenna. GSM transmitter sends this information to control system. From control system the location value read by GPS is sent to nearest police station, hospital and relatives. When this location value is given to Google map, the exact accident spot can be furnished. Figure 1 illustrates the architecture of the proposed system which consists of several modules.

![Block diagram of Accident Identification System with SMS Notification](image-url)

**Figure 1**: Block diagram of Accident Identification System with SMS Notification

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5. Applied Technology

5.1.1 GPS Technology

Global Positioning System (GPS), known as Global Satellite Positioning System, can accurately measure 98 percent of the speed and position of Earth’s surface. U.S. government completed the system in 1994. Users only need to have a GPS receiver that can be used in navigation, measurement and calibration, without paying for use of signal of Standard Positioning Service[4]. Currently, most of GPS applications were being used in navigations. In self-positioning, the target focuses on children, elderly and specific group of people [5].

Using GPS location positioning to support monitoring can reduce the risk of losing track of targets. Therefore, it can be embedded in devices as a locator to track the missing target based on the precise longitude and latitude of the location. The data received from GPS including self-positioning longitude, latitude, time and speed generally will be combined with GPRS or wireless technology.

With an appropriate display design, it is expected to transmit the live picture of the target and its surroundings to the receiver. The receiver could be any device including mobile phone, PDA, notebook, etc…, which is better than traditional search method [6]. This research will adopt GPS self-positioning to track and return location data to the server for further computation.

5.1.2 GSM Modem

Definition:

The words, “Mobile Station” (MS) or “Mobile Equipment” (ME) are used for mobile terminals Supporting GSM services.

A call from a GSM mobile station to the PSTN is called a “mobile originated call” (MOC) or” outgoing call”, and a call from a fixed network to a GSM mobile station is called a “mobile Terminated call” (MTC) or “incoming call”.

Figure 2: GSM Modem
What is GSM?

GSM (Global System for Mobile communications) is an open, digital cellular technology used for transmitting mobile voice and data services.

What does GSM offer?

GSM supports voice calls and data transfer speeds of up to 9.6 Kbits/s, together with the transmission of SMS (Short Message Service). GSM operates in the 900MHz and 1.8GHz bands in Europe and the 1.9GHz and 850MHz bands in the US. The 850MHz band is also used for GSM and 3G in Australia, Canada and many South American countries. By having harmonized spectrum across most of the globe, GSM’s international roaming capability allows users to access the same services when travelling abroad as at home. This gives consumers seamless and same number connectivity in more than 218 countries. Terrestrial GSM networks now cover more than 80% of the world’s population. GSM satellite roaming has also extended service access to areas where terrestrial coverage is not available.

6. Conclusion

We have observed the performance of accident identification system with SMS notification using GPS, GSM. It helps not only in finding the location of vehicle but also proves helpful in saving the lives of victims by finding where an accident has happened. It can be used to minimize the death and the severe conditions due to accidents for the purpose of accident detection. Finally we can say that the system has many advantages and hence it can be used.

7. Future Scope

1. This system can be interfaced with Vehicle airbag system that prevents vehicle occupants from striking interior objects such as the steering wheel or window.

2. This can 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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9. References