Vehicle with Anti-Theft and Accident Avoidance System

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ABSTARCT

At the present time, the rate of crime is increasing rapidly because it is a kind of evident from the actual fact that thefts became a matter of routine. Particularly these vehicles may incur huge losses on the part of the amount invested on these vehicles. To overcome this problem, there are numerous technologies are available in the market such as GSM systems. In the present days, most of the vehicles are designed with GSM based vehicle theft control systems, which provides the protection from thefts even if they are parked in the parking area. But major problem with all these system having a major limitation that it can alert local user only not remote. Consider a condition user is far away from vehicle and theft detection siren start then user can't listen alert and he can't take any step. And consider a condition owner wants to control his vehicle remotely using any technology it is not possible at this stage. To overcome this type of problem we are trying to implement a system which can used to interact with the system remotely. The sensors in the system identifies any anomalies occurred in the system and inform the owner using some messages. The owner can control the vehicle from a distant location based on the messages received using an android application in his mobile device.

KEYWORDS: PIC(Programmable Interface Controllers); LCD; Alarm unit; MEMS Sensor; Vibration sensor; IRsensor; Vibration motor; GSM; Solenoid valve; Relay; GPS.

I.INTRODUCTION

We have gone through many research papers regarding this topic of VEHICLE WITH ANTI THEFT AND ACCIDENT AVOIDANCE SYSTEM . In all these research papers the authors have clearly described about the working of the particular work together with its advantages and disadvantages. So in this review paper of ours we are putting a brief overview of the same works that are implemented by various authors in different ways.

We are focusing this review paper for people who are involved in the technical background. For instance, if the reader wants to know as to how the security system works in this project, he should have sufficient knowledge about microcontrollers, sensors, GSM modules and so on. Fig-1 shows the block diagram of advanced vehicle security system.
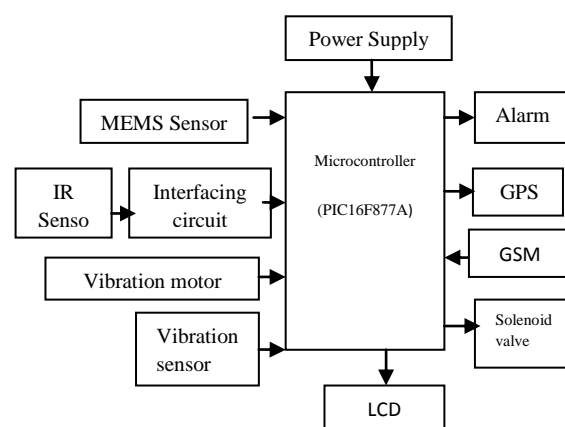
BLOCK DIAGRAM OF VEHICLE WITH ANTI THEFT AND ACCIDENT AVOIDANCE SYSTEM

For preparing this review paper, we have gone through various research papers and the reason why we studied those papers are ; Firstly, as we know, nowadays the road accidents in modern urban areas

are increased to uncertain level. The loss of human life due to accident is to be avoided.

Moreover, though with the increase in science and technology, communication system have improved a lot, but at the same time the number of accidents have also increased to a large extent. So, in these research papers we studied, steps are being taken as to how to minimize the loss of life and property despite poor emergency facilities. The authors have also aimed at giving an overview of implementing safety and security services in vehicular systems of today and future development .

BACKGROUND

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 the position of the vehicle even in dark clumsy areas where there is no network for receiving the signals. Large-area metal plates were installed on the steer or car seat as grounding or driven-right-leg (DRL) electrodes to ensure stable signals. The conventional ECG and EEG systems use Ag/AgCl electrodes with a wet electrolyte. Skin preparation is required before placing the electrodes. For eye activity detection in driving application, video cameras are commonly used to detect the eye-related parameters such as PERCLOS reopening time. Image processing algorithms and related computation processors are necessary to extract the features from video images.

DESIGN AND IMPLEMENTATION
FLOW CHART
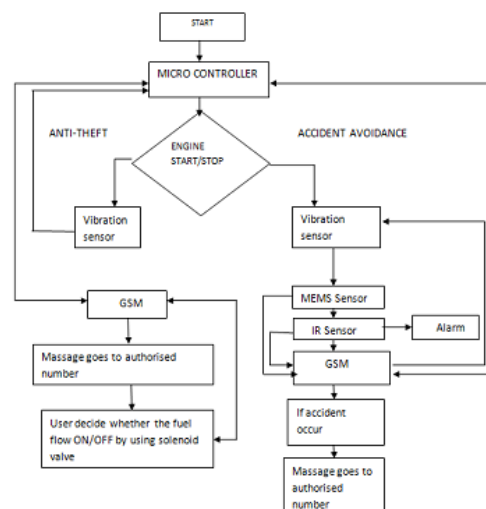
Basic idea behind the project is to implement the Vehicle security system using GSM technology. Proposed system will be able to control user Vehicle or any vehicle using GSM based SMS service as a communication media where at both end users need a GSM based modem or phone. Consider a condition if user come to know that his vehicle is not there where it should be. Then user can stop the Vehicle activities by sending some kind of predefined SMS to the system connected to the Vehicle and Vehicle will operate itself by switching off the can engine ignition system . User first sends the formatted message to the Vehicle where this message is received by the GSM modem and transferred to the system and if command is to control the Vehicle engine then system will control the Vehicle engine as per the command send. System planning is to implement following modules. MEMS, IR sensor is used to detect the rash driving, drowsiness detection. The sensors data transmitted to owner of the vehicle. The owner control the vehicle through GSM message.

IR SENSOR

An infrared sensor circuit is one of the basic and popular sensor module in an electronic device. This sensor is analogous to human's visionary senses, which can be used to detect eye blink.
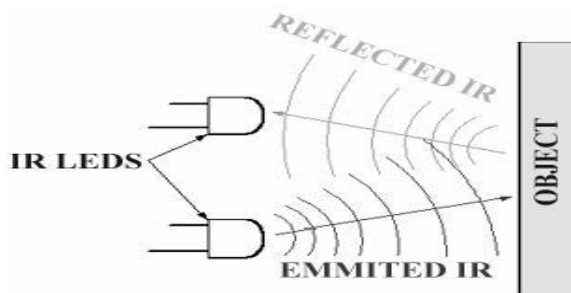
VIBRATION SENSOR

Here , we used vibration sensors when it detect vibration it send Message goes to any emergency centre to user mobile when accident occurs or engine start. The message is sent with the help of the GSM module.
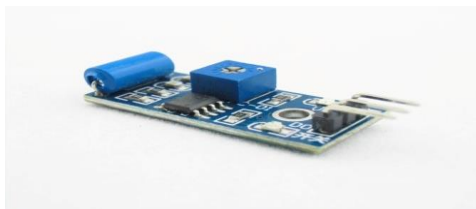

Fig of Vibration sensor

MEMS SENSOR

Micro-electromechanical systems (MEMS) is a technology that combines computers with tiny mechanical devices such as sensors, valves, gears, mirrors, and actuators embedded in semiconductor chips. We are using MEMS sensor for Detecting rash driving.Three-axis accelerometers measure acceleration in three directions. if any other person using my vehicle in rash mode, then a message automatically

send to the authorized number and after that owner will inform the driver do not drive in rash mode.

PIC16F877A microcontroller

The PIC microcontroller PIC16f877a is one of the most renowned microcontrollers in the industry. This controller is very convenient to use, the coding or programming of this controller is also easier. One of the main advantages is that it can be write-erase as many times as possible because it use FLASH memory technology. It has a total number of 40 pins and there are 33 pins for input and output. PIC16F877A is used in many pic microcontroller projects.PIC16F877A also have many application in digital electronics circuits.


Here we are using PIC16F877A for controlling GPS,GSM module, IR sensor, Vibration sensor, MEMS sensor, Relay, LCD and Solenoid valve.

GSM Module

GSM provides recommendations, not requirements. The GSM specifications define the functions and interface requirements in detail but do not address

the hardware. The reason for this is to limit the designers as little as possible but still to make it possible for the operators to buy equipment from different suppliers. The GSM network is divided into three major systems: the switching system (SS), the base station system (BSS), and the operation and support system (OSS).
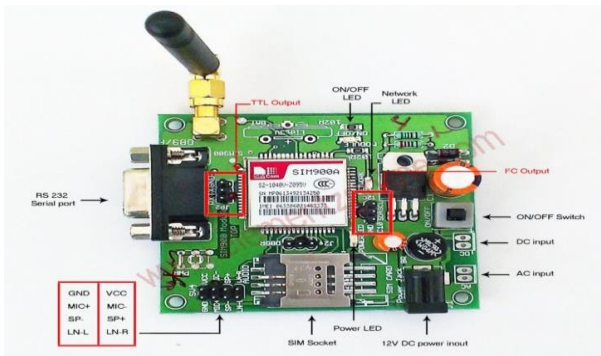
Global Positioning System (GPS)

The Global Positioning System(GPS) is a space – based navigation system that provide location and time information in all weather conditions, anywhere on or near the Earth where there is an unobstructed line of sight to four or more GPS satellites. Here we are using GPS for location.

SOLENOID VALVE

A solenoid valve is an electro mechanical actuated valve to control the flow of liquids and gases. A solenoid   valve is

an electromechanically operated valve. The valve is controlled by an electric current through a solenoid: in the case of a two-port valve the flow is switched on or off; in the case of a three-port valve, the outflow is switched between the two outlet ports. Multiple solenoid valves can be placed together on a manifold. Solenoid valves are the most frequently used control elements in fluidics.

Relay:

A relay is an electrically operated switch. Current flowing through the coil of the relay creates a magnetic field which attracts a lever and changes the switch contacts. The coil current can be on or off so relays have two switch positions and they are double throw (changeover) switches. Relays allow one circuit to switch a second circuit which can be completely separate from the first. For example a low voltage battery circuit can use a relay to switch a 230V AC mains circuit. There is no electrical connection inside the relay between the two circuits; the link is magnetic and mechanical. Here we are using Relay as a switch which control the motor(engine).

LCD(Liquid crystal display)

In this project we are using LCD to see the output.

RESULTS AND ANALYSIS

This paper gives a defend way of approaching the problem. Here first we try to avoid the most general accidents which are occurred due to bad weather conditions. And if the accident occurred then the accident location can be located easily and the detection of accident is precise unlike the prior approaches, where detection of accident is done by either of the two sensors. In this approach the accident is detected by both the vibration and micro electro mechanical sensor and the information of accident location will be sent to already predefined numbers .

We found that in all the works the main aim was to build a system whose cost would be minimum that would be affordable for common man. The efficiency of the system will also play an important part based on the frequency band of the GSM modules, the sensibility of the various sensors used like vibration sensor, MEMS sensor. The more is the efficiency of the system; the better would be the performance of the system.

FINAL DESIGN
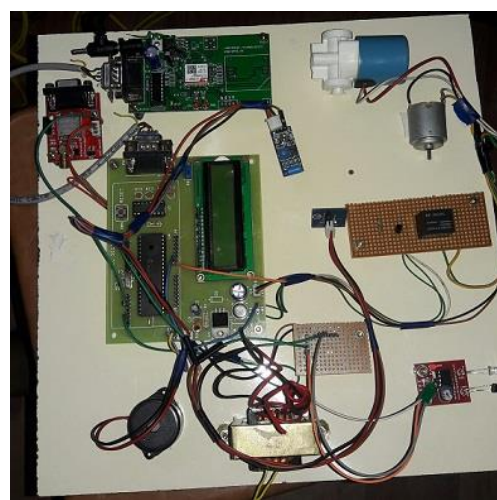
PIC Microcontroller connections with Final design.

CONCLUSION

By a brief study of all the research paper, we can come to the conclusion that this project is indeed helpful to the common people. Road accidents are common in India as well as in whole over the world. Usually accident occurs in areas which are far away from the emergency centers. So the risk of deaths increases. So with the help of this system/project the risk of deaths can be decreased to a large extent. However as every works have got particular disadvantages, certain defects are also present in these works. So the main aim is to make a project where the rectification of all the errors is to be done. As for instance, as GSM module is basically based on Queue based technique, so there occurs a particular delay in transfer of message to emergency Centre. So by rectifying this demerit a better and more efficient system can be achieved. Moreover as in all these works mentioned in the research papers, the system is being fit into 4 wheelers only. So if steps are taken that the same system is implemented in 2- wheeled vehicles also, it would much more helpful to the common people. So the main change

that can be brought in these projects is by rectifying the errors of these works.

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