

Effective Information System in Vehicle Using Arduino

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Abstract- Security in travel is primary concern for everyone. In my country, Myanmar, many accidents are caused in high way. My native town (Taungoo) is situated between the Yangon and Mandalay high way. So, my project is help traveling persons and leakage of gases from the vehicle which in turn causes accidents. This system can be help to reduce the number deaths which caused due to lack of proper treatment at the right time. This project paper describes a design of effective information system that can monitor an automotive/vehicle/car condition in traveling. This project is designed to inform about the location of vehicle, accident that is occurred to a vehicle to the family members. This project uses accelerometer sensor which can detect the unevenness of vehicle and vibrations when an accident is occurred. This sends a signal to microcontroller. Vehicle accident detection system using GSM and GPS modems is done. Messages notifications are sent to the mobile number which is prescribed. This monitoring system is composed of a GPS receiver, arduino and a GSM Modern. GPS receiver gets the geo satellite information satellites in the form of latitude and longitude. The arduino processes this information and this processed information is sent to the user/owner using GSM modem.

Keywords - GPS, GSM, ARDUINO UNO.

I. INTRODUCTION

Major deaths occur due to the road accidents in all over the world. It can only reduce the deaths after accidents but we cannot manage the behaviors of the drivers such as alcohol driving and drug addicted persons drive etc. these behaviors cannot be controlled. Automatic detection of crashes is largely applied in various automobile industries such as tesla one of the leading example. The core principle of the project is to reduce the number deaths which caused due to lack of proper treatment at the right time. The system is currently in an unpolished level .i.e the complete end product has to be made only with the help of industries. In order to make these we need to reduce the dimensions of the system and also the cost with which it is implemented.

1.1. Literature Survey

This project uses accelerometer sensor which can detect the unevenness of vehicle and vibrations when an accident is occurred. This sends a signal to microcontroller. Vehicle accident detection system using GSM and GPS modems is done. Messages notifications are sent to the mobile number

which is prescribed. This monitoring system is composed of a GPS receiver, arduino and a GSM Modem. GPS Receiver gets the geo satellite information satellites in the form of latitude and longitude. The arduino processes this information and this processed information is sent to the user/owner using GSM modem.

II. PROBLEM STATEMENT

In high ways driver is driving with high speed as one of the major reason of accidents in worldwide. Another one is drivers under the influence of alcohol show a clear failure of perception recognition and vehicle control. So, by this accident occurs. In system construction, it mainly consist of two part namely as software part and hardware part. software part include embedded software for interfacing of various hardware component like LCD display ,microcontroller ,GSM,GPS etc.

When the vehicle is accident in the high way, along with this scheme we are also going to monitor behavior of vehicle in both inside and outside of vehicle. Along provide help to driver when in case accident happened by sending

message to ambulance, police station and relative of driver also. Following Figures 1 shows block diagram of our system with architecture.

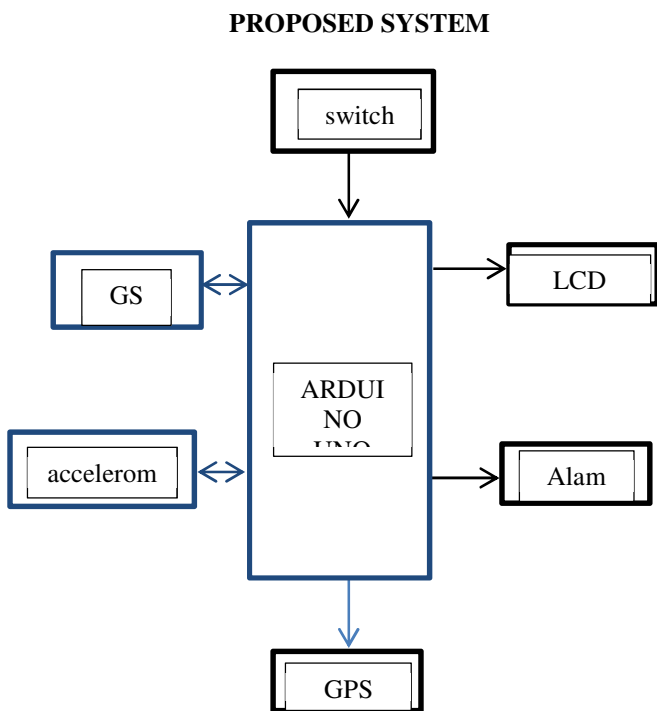


Figure1. Hardware Modules

2.1 Block Diagram Explanation

LCD Display:

The LCD display is fitted inside the car and this LCD display is act as indicator to driver and other people who are sitting inside the car. This display gives information warning message when the car is accident.

GSM Modem:-

In this we using GSM Modem 300, this GSM Modem can accept any GSM network operator SIM card as like a mobile phone with its own unique phone number. Applications like SMS Control, data transfer, remote control and logging can be developed easily. The modem can either be connected to PC serial port directly or to any microcontroller. It is also send to relative and police station with car no and location using GPS system when the car is accident.

GPS (Global Positioning System):

GPS is a global positioning system which is used to get the location of particular object in latitude and longitude. we are going to use GPS system to send position information to police and relative of driver as well as accident happen then location, Vehicle no. is send to police station ,relative and

ambulance for providing treatment immediately or as early as possible. The Global Positioning System (GPS) is a satellite-based navigation system consists of a network of 24 satellites located into orbit. GPS works in any weather circumstances at anywhere in the world. Normally no subscription fees or system charges to use GPS. A GPS receiver must be locked on to the signal of at least three satellites to estimate 2D position (latitude and longitude) and track movement. With four or more satellites in sight, the receiver can determine the user's 3D position (latitude, longitude and altitude). Once the vehicle position has been calculated, the GPS unit can determine other information like, speed, distance to destination time and other. GPS receiver is used for this research work to detect the vehicle location and provide information to responsible person through GSM technology.

Microcontroller (ATmega328) :

In this system we are using Arduino board which has advantageous features in which microcontroller ATmega328 are present which is to be using for controlling system .The Arduino Uno is a microcontroller board based on the ATmega328.ATmega has features like speed 20 MHz ,Power supply 1.8-5.5 ,Operational range -40C to 85C ,32KB F lash ,1KB EEPROM ,2KB RAM. Arduino has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything require to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. The Uno differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it features the Atmega8U2 programmed as a USB-to-serial converter.



Figure 3 Arduino Board Description

Bumper Switch:

Bumper switch is kind of switch which is a very effective sensor for collision detection. Bumper switch works as a pushbutton i.e. it is activated when pressed and the microcontroller then performs the necessary action for

this condition. This sensor is a very simple way to test collision detection function in any scenario .when some another vehicle collide then this switch is get activated.

Accelerometer sensor:

This can detect the unevenness of vehicle and vibrations when an accident is occurred. This sends a signal to microcontroller. Vehicle accident detection system using GSM and GPS modems is done.

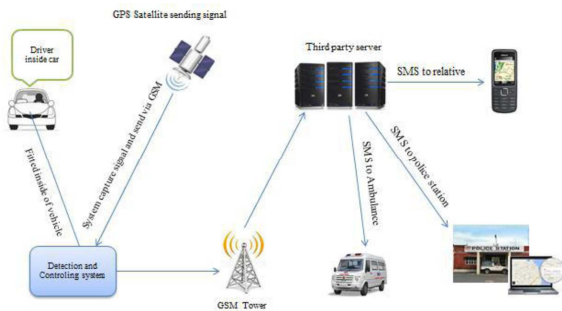


Figure 2 Proposed System Architecture

III. RESULT & DISCUSSION

Vehicle is accident, accelerometer sensor is detected the unevenness of vehicle and vibrations when an accident is occurred. It sends a signal to microcontroller. Vehicle accident detection system using GSM and GPS modems is done. Messages notifications are sent to the mobile number which is prescribed. This monitoring system is composed of a GPS receiver, arduino and a GSM Modem. GPS Receiver gets the geo satellite information satellites in the form of latitude and longitude. The arduino processes this information and this processed information is sent to the user/owner using GSM modem. The core principle of the project is to reduce the number deaths which caused due to lack of proper treatment at the right time.

IV. CONCLUSION

Proposed system can notify relatives of driver, police station. Future scope of this system is it can also check whenever the accident happens will notify immediately to the numbers provided in application by the end user and therefore people in the car can get service as early as possible by minimizing the casualties. To implement this approach GSM system can be used, it will also help to reduce the number deaths which caused due to lack of proper treatment at the right time.

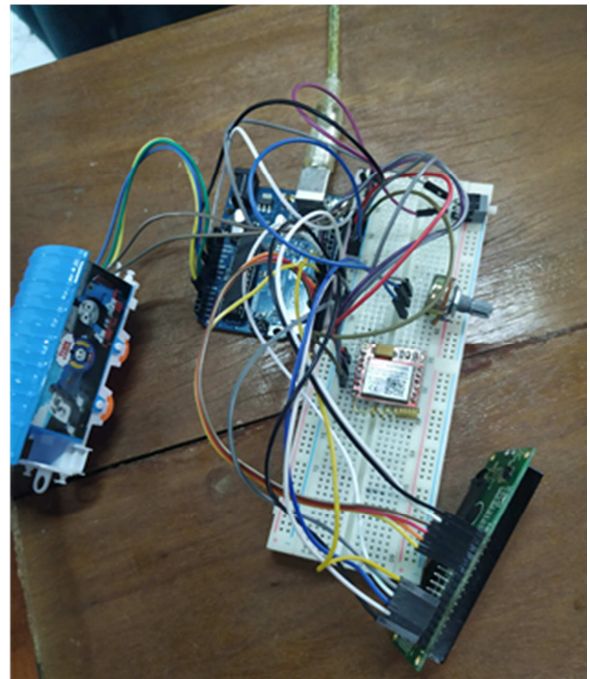


Figure4 Hardware setup



Figure5. Output on LCD

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