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Automatic Vehicle Accident Detection and Messaging System

Arpit Awasthi[1], Deepak kumar[2], Sandeep Bhatia[3] , Sonali Singh[4], Apoorv Tyagi[5], Prasoon Gaur[6]

Student, Dept. of ECE, Raj Kumar Goel Institute of Technology, Ghaziabad, Uttar Pradesh, India[1]

Assistant Professor, Dept. of ECE, Raj Kumar Goel Institute of Technology, Ghaziabad, Uttar Pradesh, India[2]

Assistant Professor, Dept. of ECE, Raj Kumar Goel Institute of Technology, Ghaziabad, Uttar Pradesh, India[3]

Student, Dept. of ECE, Raj Kumar Goel Institute of Technology, Ghaziabad, Uttar Pradesh, India[4]

Student, Dept. of ECE, Raj Kumar Goel Institute of Technology, Ghaziabad, Uttar Pradesh, India[5]

Student, Dept. of ECE, Raj Kumar Goel Institute of Technology, Ghaziabad, Uttar Pradesh, India[6]

ABSTRACT: In Today's life the use of vehicle and advance technology is growing very fastly because of this there is both the advantages and the disadvantages. The advancing technology has increased lot of vehicle accident which results in lot of life loss. The main purpose of our project is to mainly focus on detection of vehicle accident and help in tracking the exact location of vehicle and the position where accident occured. Location parameters such as longitude and latitude are sent through SMS. Microcontroller AT89s51 is the main part of our project around which all other part works and we monitored the above-mentioned parameters through the microcontroller for accident detection. For the measurement GPS modem is used which determine the exact location of vehicle and provide correct coordinates. Hence, we have used SR86 GPS modem. GSM modem sends alert sms after receiving exact location from the GPS.The main part of our project is microcontroller AT89s51.16×2-line crystal display is used showing current status. The interfacing of GPS & GSM modem and microcontroller AT89s51 is done by using MAX232 IC. This MAX232 IC is used for sending the data to the GPS and GSM modem also. Power module supplies 5V power with help of IC7805. Here EEPROM AT24C16 is also used for storing the family members number and the emergency numbers. As a improvement we have also used alcohol sensor which will monitored the level of alcohol consumed by the driver and give alert message if the alcohol level is found more than the level which was set. For further scope we can also add web camera in it so it can provide the accurate situation of the driver.

KEYWORDS: Limit Switches, Microcontroller AT89s51, GPS modem, GSM modem, Alert message, Alcohol sensor,16×2 LCD.

I.INTRODUCTION

The advancing technology continuously increasing the traffic hazards and road accidents on the highways. Rash driving is the main reason of accidents. But in many situation the police or the ambulance is not informed in time and because of this reason proper medical attention is not given to the people which lead to loss of life. Our project is designed to avoid such situations. Our project take very less time to find the accident occurred and immediately give the alert message to the family members. And the alert message contains the exact location of the vehicle with proper latitude and the longitude. If the accident is minor and no casualty is there then the driver can immediately terminate the alert message by using the given switch.

Our device consists of limit switches which are fitted on the front and back side of the car. When the accident occur and the car is hit to other vehicle or any other object then the limit switches get pressed and and they immediately send signal to the microcontroller. As microcontroller is heart of the device, Once it gets signal from the limit switches, then it will immediately turn on the buzzer.

After that microcontroller will get latitude and longitude from the GPS modem and send this information to GSM modem. GSM modem will then send this information to the family members or to the police station via SMS. So that proper and immediate help will be provided to the victim in very less duration of time.

And in case if driver has consumed the alcohol then the alcohol sensor which is placed on steering wheel of the car will detect the level of the alcohol and if alcohol level is detected more than set level then SMS will be send to the owner of the car or to the family members.

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II.METHODOLOGY

2.1 WORKING

i. Limit switches will get pressed when the accident occur and its give signal to the microcontroller.

ii. A buzzer which is present in this device will start beeping which indicates that the whole device is now activated.

iii. The GPS modem will detect the proper coordinates i.e latitude and longitude and tell the exact location of the vehicle.

iv. There are many pre saved phone numbers in the EEPROM on which sms will be send. User can change these numbers any time.

v. With help of the GSM modem, microcontroller will send alert message to all the numbers that are pre saved. The alert message will contain exact location of the vehicle.

vi. 16×2 LCD displayed the current status of the output with proper instructions.

vii. In case if the accident is minor and no casualty is happened, then the driver can immediately terminate the alert message by using the given switch and then the whole system will start working once again from the starting.

viii. The alcohol sensor used in our system will also work same as the accident sensor and gives current status to the microcontroller if the level of alcohol is detected more than the level set.

ix. In this we also used 4 pre defined key which is used to send pre decided SMS. In this we can set our own choice of message i.e if 1 key is pressed then it will send message that 'i need help', similarly 2nd key is pressed then it will send message that 'safely reached' etc.

2.2 GSM- Global system for Mobile Communication

GSM basically stands for global system of mobile communication. The Bell laboratories development the idea of GSM firstly in 1970. It is commonly used in the whole world. GSM operates at various frequency bands i.e 850MHz, 900MHz, 1800MHz etc. It used TDMA technology for communication purpose. A GSM used channel to send data, before sending the data GSM reduces the data. This GSM system have speed of 64 kbps which can goes Upto 120Mbps.TTL- level serial interface is provided by the GSM modem to there host.

There are 3 components of the GSM System:
1. Mobile Station
2. Base Station Subsystem
3. Network Subsystem

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Figure 1: GSM Module

2.3 GPS- Global Positioning System

GPS stands for Global Positioning System .GPS receivers received the signal from the space and provide all the coordinates properly which helps in determining the exact location of the vehicle in very less time. GPS provide exact location continuously in all type of whether condition, 24×7 and on each part of the earth. We used SR86 GPS modem in our project. State of reception of GPS depends upon the strength of the GPS signal. The greater the signal strength is , more stable the reception status is.GPS receiver contain antenna with pre amplifier and also a RF section with signal identification.

Figure 2: GPS module

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2.4 Hardware Description

i. **LIMIT SWITCHES / METAL PLATES:** These are used to detect the accident that has occurred. limit switches get pressed when vehicle hit another vehicle and activates the whole system and send messagesmicrocontroller

ii. **MAX232:** MAX232 IC was firstly created in 1987 by Maxim IC that converts TIA-232 serial port signal to signals which are suitable for use in TTL-compatible digital logic circuits. Max232 work both as transmitter and receiver.

iii. **BUZZER:** It is a electrical device which produce audio signal and buzzing sound. The buzzer start beeping when accident occurs and showing that the whole system is activated.

iv. **EEPROM:** EEPROM AT24C16 stands for electrically erasable programmable read only memory. It stored the phone numbers so that the SMS can be send. Data stored will not loss if power is off.

v. **GPS**: GPS receivers received the signal from the space and provide all the coordinates properly which helps in determining the exact location of the vehicle in very less time. GPS provide exact location continuously in all type of whether condition.

vi. **GSM:** The GSM modem will send the alert message with proper coordinates to the pre saved numbers on EEPROM. It digitizes and reduce the data.

vii. **LCD:** 16*2 LCD displayed the current output status with proper instructions.

viii. **RESET / KEYPAD:** Resetting of microcontroller done by this button. After pressing this button alert message is immediately terminated and make whole system to start working once again from starting.

ix. **MICROCONTROLLER**: Microcontroller AT89s51 is the main controlling unit of the project. The AT89s51 is a low power, high performance CMOS 8 bit microcomputer with 4k bytes of flash programmable and erasable read only memory (EEPROM).

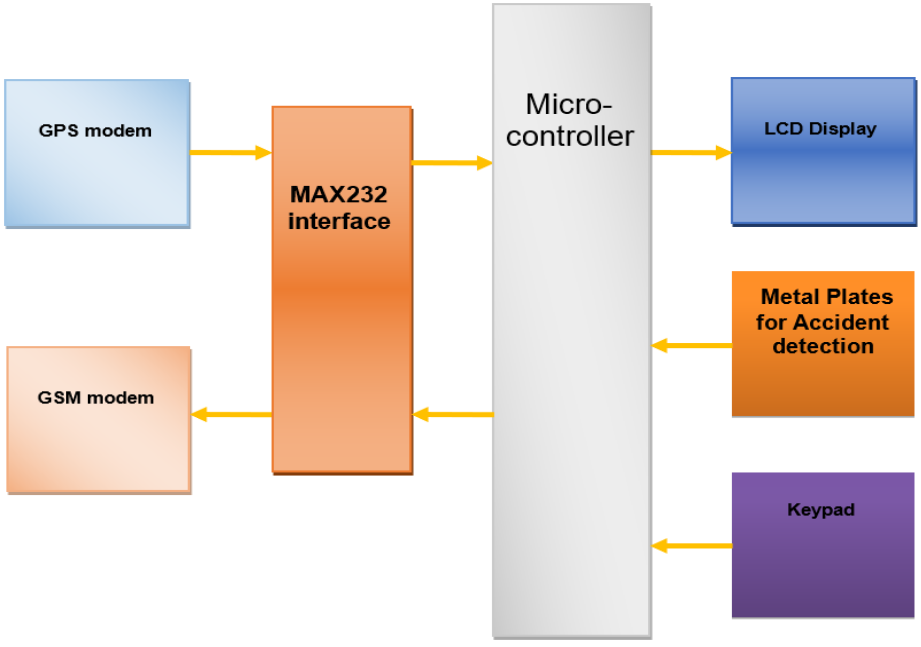

Figure 3 : Block Diagram

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IV.RESULT

Result of Alert message is shown below:

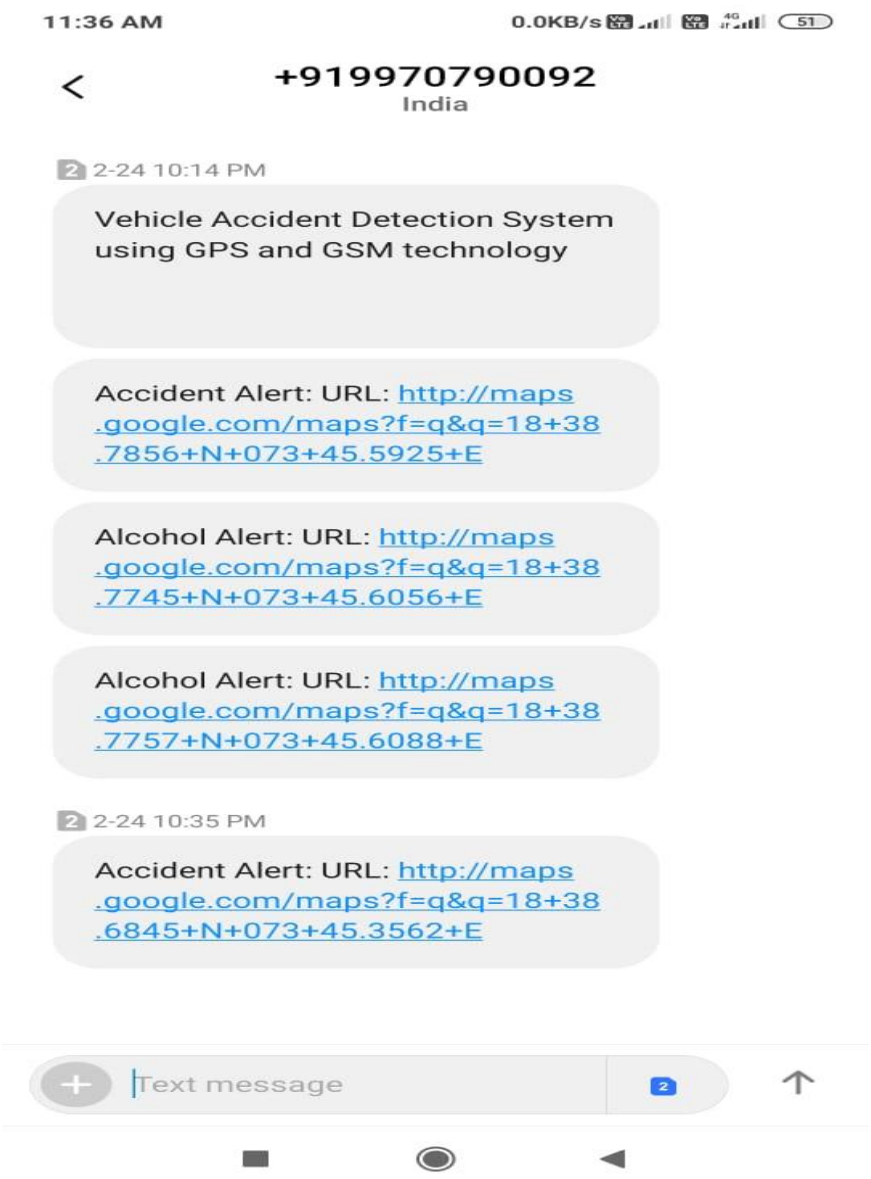

Figure 4 : SMS showing location

IV. ADVANTAGES

i. It's cost is less

ii. It provide exact and accurate situation

iii. It's Response is very fast and immediately alerts medical team

iv. Design is very simple and can be easily interfaced with other devices

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v. Easy to use and working is simple

vi. System is efficient and reliable.

V.APPLICATIONS

i. It helps in providing security to the vehicle in case of vehicle stolen and tracking can be done by using all coordinates provided by the GPS system.

ii. Wireless web camera interfacing can be done with our system so when accident occurs the web camera provide the accurate situation and help in monitoring health of the driver.

iii. Interfacing of airbag of the vehicle with our system can be done in order to provide more security in case the accident occurs.

iv. This project can be used by cab companies to track there vehicle and knowing the exact location of there drivers.

VI. CONCLUSION

In this new age of technologies our project serves something good to this world and easily satisfied the basic needs and basic requirements of the user. This system provides immediate help to victim in case of accident occurs so that proper treatment can be given to the victim. This project is very beneficial for the police and the medical units. This project help in reducing life loss . We can also add many new features in it and traffic violation cases can also be determined with help of this system.

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