



# Accident Detection and Notification System

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**ABSTRACT:** Many a times the person who met with an accident doesn't get any help from the surrounding hence auto-detection of accident and notifying the accident with the location to a victim's relatives and emergency services plays a vital role in saving person's life. This paper describes the implementation of microcontroller based accident detection and notification system. The sensing unit contains collision sensor, alcohol sensor and tow sensor which are used to detect accident and towing of vehicle. When accident happens GPS skytrek s1315 is used to track real time location and GSM 900 is used to notify the accident via SMS. The GPS will track location in terms of latitude and longitude and the SMS 'containing GPS data' will be sent to the victim's relatives (numbers which are stored by user in our system) and emergency services like hospitals, police station etc. LCD is used to display the location and status of the vehicle. Software program developed using BASCOM AVR compiler. The proposed model is successfully implemented and tested with prototype model.

**KEYWORDS:** Accident Detection, Accident Notification, GPS, GSM, Alcohol Sensor

## I. INTRODUCTION

Accident notification system is the process of providing notification of an accident to the victim's friends, relatives & emergency services.

Since each and every moment is very crucial after an accident, with this paper we tried to provide an aid by providing real time notification of accident.

Sometimes road accidents becomes a major issue which is yet to be solved that it is a road accident or a murder? As these issues were rightly discussed in the "Satyamev Jayate- season 3 episode 2" by satyamev jayate team about road accident. So we got inspiration from this and came up with solution.

Two major causes of road accident are-

1. Drink and drive
2. Carelessness

People tend to avoid helping the people met with an accident because of critical issues involved in it. So we came up with a prototype model in embedded system to help the people met with an accident.

## II. LITERATURE SURVEY

Current Study shows that frequency of providing aid during an accidents tend to be as is or is lowering. This issue also has been pointed out in the famous show known as "Satyamev jayate" that public people present in surrounding of accident tend to avoid helping during these type of situation.

Also one real life example given in show as, "the victim has met with an accident and is severely injured, but no one among 45-50 people present near to that, did not tried to provide either aid or a help even after a 45minutes after the accident", this happens majorly because people tend to be threaten by the police issues involved in this type of situations. Whereas our System is independent of any, & is able to provide notification of an accident to the victim's relatives & to the emergency services.

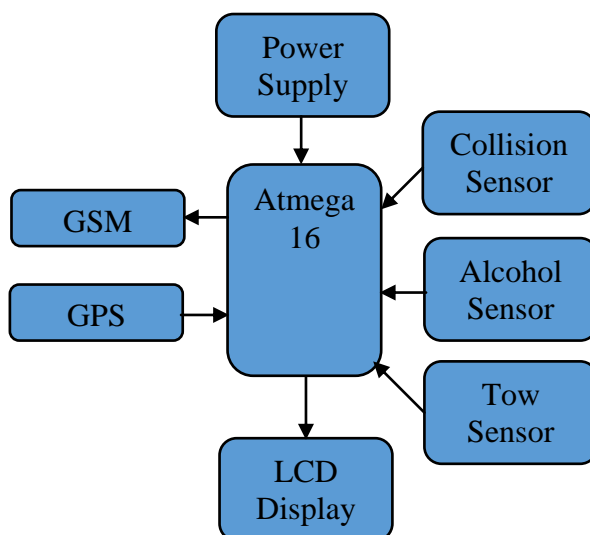
## III. PROPOSED MODEL

Microcontroller used is ATMEGA 16 where 16 represents 16kb of in system flash memory. The microcontroller operates at crystal frequency of 11.0592 MHz [2]

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**Fig 1** Block Diagram of Accident Notification System

It is a 40 pin IC consisting of four 8-bits input-output port with some special functions.

Port-A (8bit) used as input port having special functions of ADC, sensors are connected to this port to convert the analog signal in the form of digital data.

Port-D (8bit) having special serial communication features, PD0(receiver) and PD1(transmitter) are used for communicating with GPS and GSM.

Port-C (8bit) used as output port to connect the LCD display.

## A. LCD Display

16\*2 LCD is used in 4 bit data mode to display the current location.

Db4, Db5, Db6, Db7, E and RS are connected to the port c of the microcontroller

## B. GPS Module skyterk s1315

GPS skytrek s1315 module is used to track the location

It uses NMEA standard, the data is in the form of GPGGA format, it looks like this, [4]

\$aacc,c--c\*hh<CR><LF>

\$ start of sentence

aacc address field-GPGGA

, separator

c--c data block

\* checksumdelimiter

hh error checker

<CR><LF> next line

## C. Algorithm used for GPS

1. The data will always start from "\$" sign
2. Then receives GPGGA-global position system fix data
3. , indicates separation of data
4. 100522.236 indicates time 10hr 05min 22 sec 236ms
5. 5266.3566,n latitude 56 degrees66minutes 3566sec north

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(An ISO 3297: 2007 Certified Organization)

Vol. 4, Issue 4, April 2015

6. 5266.3566,s longitude 56 degrees66minutes 3566sec south

7. Checksum

## D. GSM Module

GSM 900 module is used to send the message

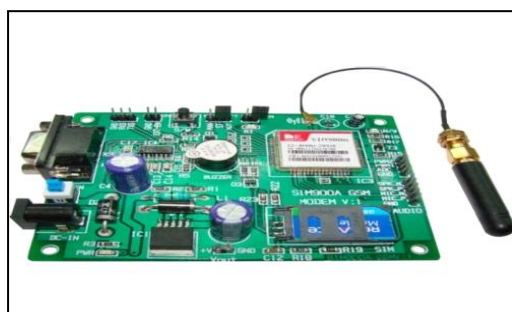


Fig 2 GSM Module

It is used to send SMS to the friends and relatives of victim.

Commands used in our paper [7]

AT+CMGF: It is an AT command used to set the GSM module in short messaging service mode (SMS). In this SMS is in the form of readable text

AT+CMGS: It is an AT command used to send SMS.

**Sensors used** - collision sensor, alcohol sensor, and tow sensor

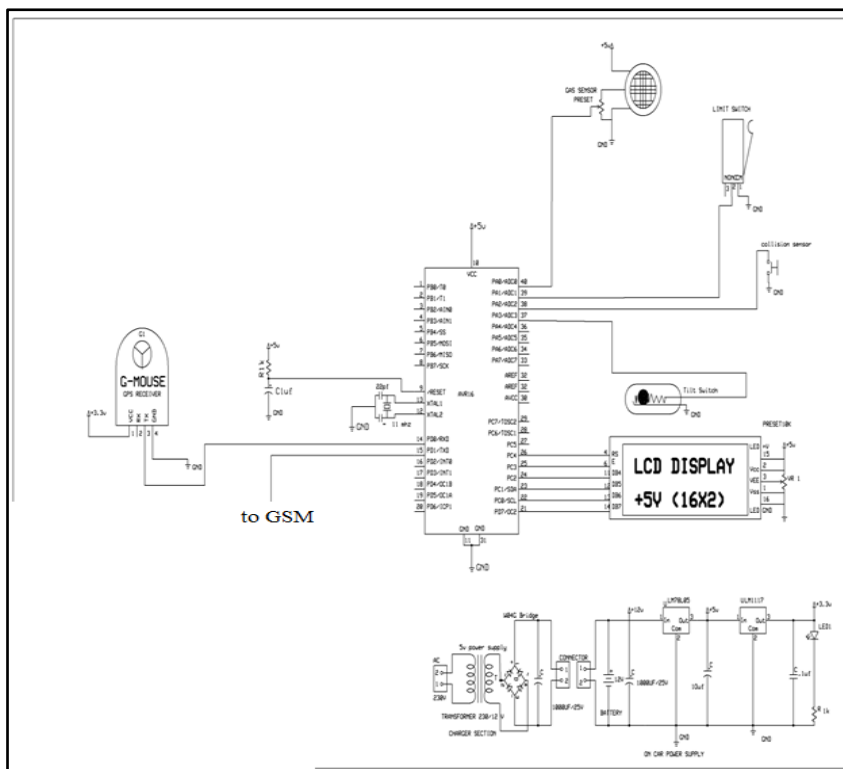


Fig 3 Circuit Diagram of Accident Notification System

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(An ISO 3297: 2007 Certified Organization)

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2 dc motors are connected to the toy car at the back running on 12v supply  
GPS is connected to the receiver pin of microcontroller and GSM is connected to the transmitter pin of microcontroller and sensors are connected to the port A which has ADC features which converts the analog signal received by sensors to digital data which is to be processed by microcontroller.

## IV.SENSORS USED

### A. Alcohol Sensor



Fig 4 Alcohol Sensor

It is used to detect tow it is normally on as both the electrode of the switch are shorted when the car is towed, then the mercury flows at other side and disconnects the switch.[6]

It is used to detect the tow. It is placed at 45 degree as no slope is of that angle. If car is slanted at an angle of 45 degree than mercury will disconnect the switch resulting in tow detected sends the message “alert message: Tow detected at location XYZ Spot”.

### B. Mercury Switch



Fig 5 Mercury Switch

It is used to detect tow it is normally on as both the electrode of the switch are shorted when the car is towed, then the mercury flows at other side and disconnects the switch.[6]

It is used to detect the tow. It is placed at 45 degree as no slope is of that angle. If car is slanted at an angle of 45 degree than mercury will disconnect the switch resulting in tow detected sends the message “alert message: Tow detected at location XYZ Spot”.

## V.FLOWCHART

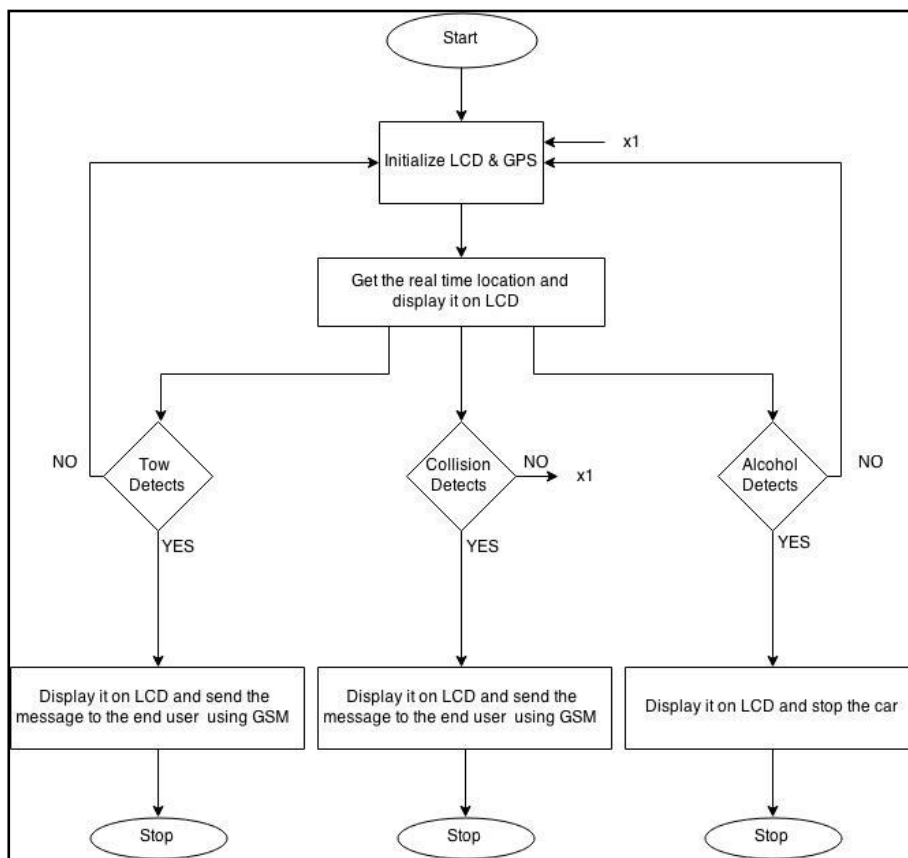


Fig 6Flowchart

In this, GPS is continuously tracking the real time location. If collision occurs then the output of sensor goes low which starts location tracking by using GPS and sends to the receiver pin of microcontroller and then message is sent to the number which are fed in the code through transmitter pin of microcontroller containing “alert message: collision detected at location XYZ Spot”

Alcohol sensor mq3 is used to detect the alcohol detection capability of 10-1000ppm as we want it detect only drivers alcohol concentration. As it detects the alcohol it sends the message “alert message: alcohol detected at location XYZ Spot” and the 12v battery is disconnected from the motor and car gets stopped.

Tow sensor - mercury switch is used to detect the tow. It is placed at 45 degree as no slope is of that angle. If car is slanted at an angle of 45 degree than mercury will disconnect the switch resulting in tow detected sends the message “alert message: Tow detected at location XYZ Spot”.

## VI.SOFTWARE REQUIREMENTS

### BASCOM Software

BASCOM is an acronym of BASic COMpiler compatible with windows. It uses structured programming.it gives fast machine code rather than interpreted code. The variable and labels length can be as long as 32 characters. Its commands are compatible with Microsoft VB/QB.

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## VII.RESULTS



Fig 7 Displaying car name and current location

The first line displays in LCD represents the B.M.W X7 is the name of the car. The second line represents the latitude and longitude.

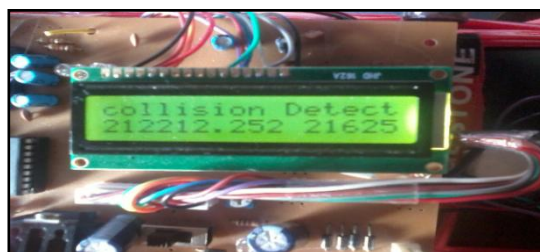


Fig 8 Displaying Collision detection with location

The first line displays in LCD represents the collision detected is the status of the car. The second line represents the latitude and longitude.



Fig 9 Displaying Tow Detection

The first line displays in LCD represents the tow detected is the status of the car. The second line represents the latitude and longitude.

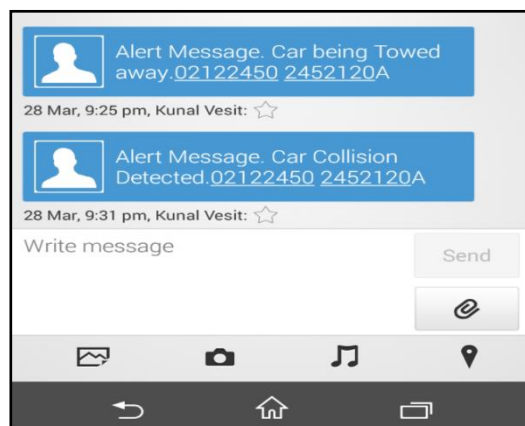


Fig 10 Screenshot of message received



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The screen shot represents the messages sent to the victim's relatives and emergency services.



Fig 11 Prototype Model

The final prototype of the system.

## VI. CONCLUSION

By having such a system which is focused on to reducing the time for getting help to the victim we conclude that our system is properly getting the real time location and sending the message as per requirement.

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