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Smart Car Prevention and Security

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Abstract: ***In this paper an accident prevention system is being introduced with accident identification for vehicles that will give a higher probability to reduce the accidents taking place every day on roads [1] and at the same time if accident occurs, the system will send SMS to the people family or those people who will be able to take immediate actions. Here, a Microcontroller based system has been developed by using Global System for Mobile Communication (GSM) technology. A magnetic sensor will also be used that will measure the distance from other vehicle. When the distance of the car will be more than the enough close for the car, a warning will be given automatically and blow car back red light. Also, whenever an accident will take place, the SMS send using GSM. The system also used security purpose of the car like sky button, door open. The system is of low-cost and is user friendly.***

Keywords: GSM; Magnetic sensor; LM35; Proximity sensor; Microcontroller; LCD; Keil

I. INTRODUCTION

Now-a-days lots of accidents happen on highways due to increase in traffic and also due to rash driving of the drivers[2].And in many case the family, ambulance or police is not informed in time. This result of delaying cause death by accidents. Based on the bar graph in Fig.1, one can observe that the number of accidents that took place are around 3,45,000 died in only 10 cites according to Accident India 2016 Report[3] and as per Indian express 17 people die every one hour in India[4].

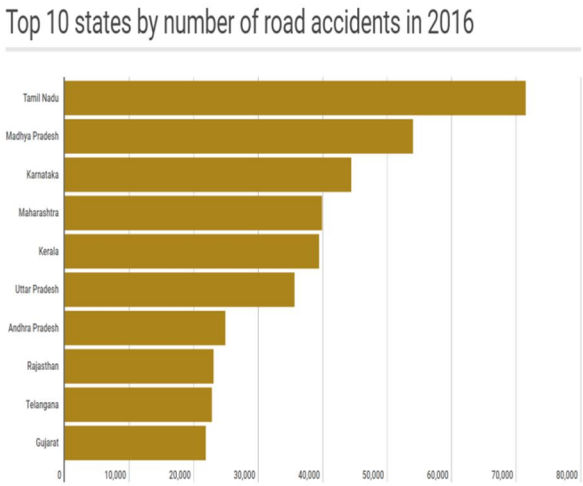

Figure 1.Accident India 2016 Report

For solving this problem, in this paper a system is introduced that is basically GSM oriented using UART. This system will continuously send SMS to the respectively mobile number if system detect as per program. The magnetic sensor will allow us to detect the closeness of the other vehicle and when this value will cross the defined value then send SMS with the help of Microcontroller and GSM module. A buzzer module is also used to generate alert the driver and other person nearby and LCD display to aware the people inside the vehicle about the danger. This increases the probability to reduce accidents [1]. A water level detector is also used near engine to prevent water during heavy raining season or flooding. For security of the car and the people we used a sky emergency button and door open concept. It sense and send the SMS to the predefined mobile number.

II. RELATED WORKS

Many research works are going on in this topic. Md. Marufi Rahman developed a system that can locate the real time GPS coordinate which will then be sent to a cell phone [10], A smart phone based accident detection system is proposed by C.

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Thompson et al. [12]. Jennie Connor and his friends find acute sleepiness in car drivers significantly increases the risk of a crash in which a car occupant is injured or killed [15].

III. MODEL OF THE SYSTEM

When the value of the IR sensor and proximity sensor will exceed the range then a SMS will be sent through GSM module. This will be shown on the LCD display and alert alarm to the driver please verify .In Fig.2 the model is shown.

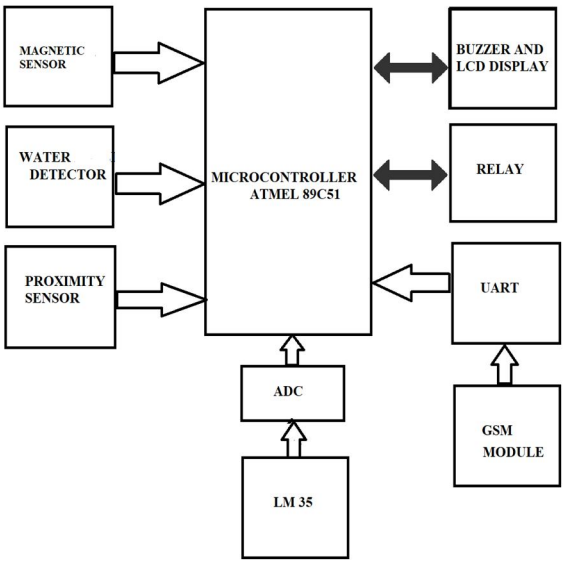

Fig 2. Architecture of system

IV. SYSTEM ARCHITECTURE

The total system is based of Microcontroller. After receiving the data from the sensors and GSM module it first fetches the data than decode the data and finally execute its operation. Here in Fig.3 shows the simulation circuit diagram of the designed system where microcontroller is connected with LM35, GSM module (SIM300), Water level detector, proximity sensor, LCD display and buzzer.

A. Temperature sensor (LM35)

Temperature sensor basically measures the heat/cold generated by an object to which it is connected [5].In this paper we used LM35. The LM35 series are precision integrated-circuit temperature devices with an output voltage linearly proportional to the Centigrade temperature [6].It sense the temperature from -55°C to 150°C range. We used maximum temperature of engine of car is 40°C. Above 40°C send SMS to the driver and buzzer alert to alert the driver about engine may catch fire.LM35 give output in analog signal and microcontroller understand digital signal. So, we add ADC between LM35 and microcontroller. We add one more component operational amplifier to amplifier the LM35 output from 1.5V to 5V to connect 5V ADC Vref. Gain of operational amplifier state that:

$$G=Vo(5V)/Vi(1.5V)=1+Rf/R1 \text{ And } Rf=2.3k\Omega$$

where, 'Vo' is output voltage unit: Volts, 'Vi' is input voltage unit: Volts, 'Rf' is applied resistance and R1 assume is 1KΩ.

B. Microcontroller AT89s52:

The AT89S52 is a low-power, high-performance CMOS 8-bit microcontroller with 8K bytes of in-system programmable Flash memory [7]. The microcontroller always by default 1 because of pull up resistance inside. We connected the logic 1 to logic 0 to complete the circuit and sensor work.

C. Water Level Detector

This system mainly works on a principle that "water conducts electricity"[13]. The sensor applied near engine of the car to prevent water not enter into engine.

D. Proximity Sensor

A proximity sensor is a sensor able to detect the presence of nearby objects without any physical contact [14].The sensor applied back of the car to detect any magnet contact to the car.

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E. SIM300 GSM Module

A GSM modem is a specialized type of modem which accepts a SIM card, and operates over a subscription to a mobile operator, just like a mobile phone [8]. In this project SIM300 GSM module is used for sending SMS. When the temperature will exceed the range for the given condition, water level of car increased and IR sensor to prevent the driver from accident before it happen. GSM will send SMS to selected numbers in Fig.3 which shows the SMS received by the cell phone.

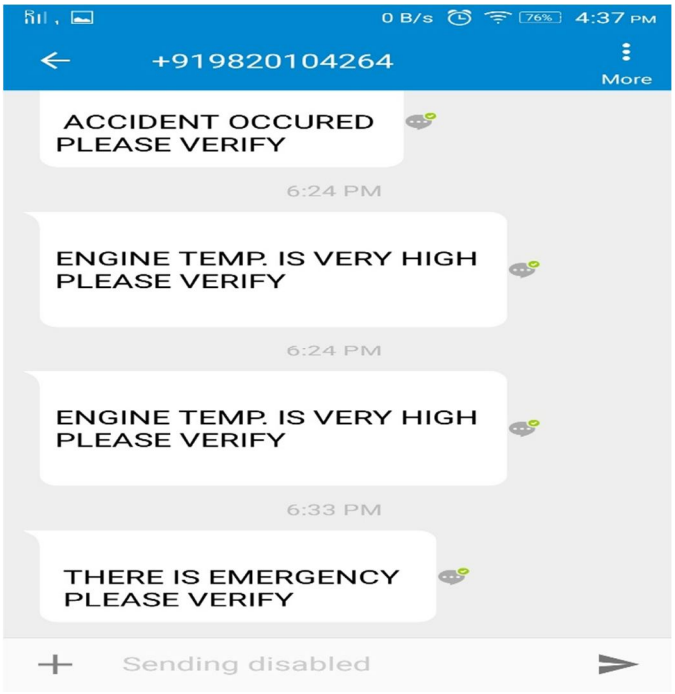

Fig 3.SMS sent from GSM module

V. HARDWARE CIRCUIT

Here in fig 4. the implemented hardware circuit is shown. Microcontroller connect to all sensor and GSM Module through UART. The microcontroller work on 5v only and by default it has value logic 1 because of pull up resistor inside microcontroller.

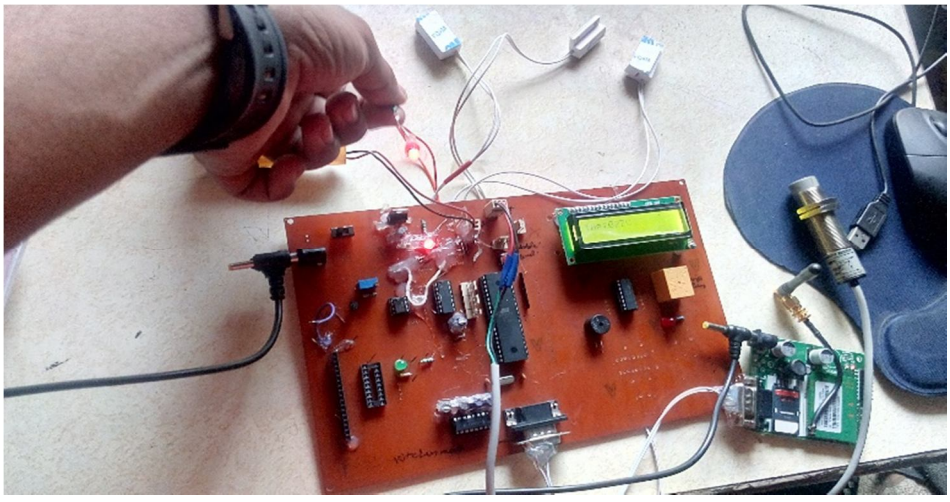

Fig 4.Implement Hardware Circuit

VI. SOFTWARE

A. In this Project, we Used Two Software Given in The Following Below

1) Keil u Vision5 : The µVision IDE combines project management, run-time environment, build facilities, source code editing, and program debugging in a single powerful environment. This software help to complete our code in c programmer and convert into hex file.

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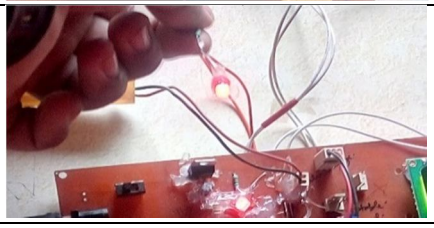
2) VP812: VP812 is an excellent USB UNIVERSAL programmer for 8051(version 89s52) USB connectivity enables easy connection with PC. The hex file of keil used in this software to burn the code in microcontroller.

VII. FUTURE SCOPE

In this proposed project we only used GSM to send message.in future use a GPS module for better accurate location of the car.it help to give faster reaction to the operation. This can also be developed by interconnecting the camera to the controller module that can take the photograph of the accident spot that makes the tracking easier [16].

VII. RESULT ANALYSIS

CAR ACCIDENT	OUTPUT IN LCD
When car is engine temperature exceed a limit or it may catch fire it indicated by LCD and send SMS predefined mobile number	
When car run during heavy rainy season or flooding it most possible water enter into engine and car stop before going into danger it send a SMS water level is high and it show in LCD.	
When car accident occurred and it sense by our proximity sensor.	
It is a security case of car when thief or some other people try to unlock the car without your permission. It detect send SMS and shown in LCD and a buzzer alert other nearby car.	
It is sky button which put in secure area which used in emergency. Example. A girl car stop at midnight and some miscellaneous thing happen then SMS of emergency send to the family member, police station and any predefined number	
When other car enough close around 3 cm then it sense by magnetic sensor and blow the car back red light to stop other car to not bring close enough. The red light of the car indicated by red led.	

Here in Table I the output result in LCD display corresponding with SENSOR RESPONSE is shown

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VIII. CONCLUSION

This paper offers a system that will save the life of many people on roads due to overheat of engine and Natural phenomena. It has been mainly designed in order to avoid accidents and to alert the drivers about the overheating of vehicle for safe travelling and alert about water leveling. Thus we can bring down the alarming rate of road accidents. Because of the flexibility of the embedded system, this system is compatible to any type of vehicle and is affordable to common man [9]. Thus, the proposed system can serve the humanity by a great deal as human life is valuable.[11].

IX. ACKNOWLEDGMENT

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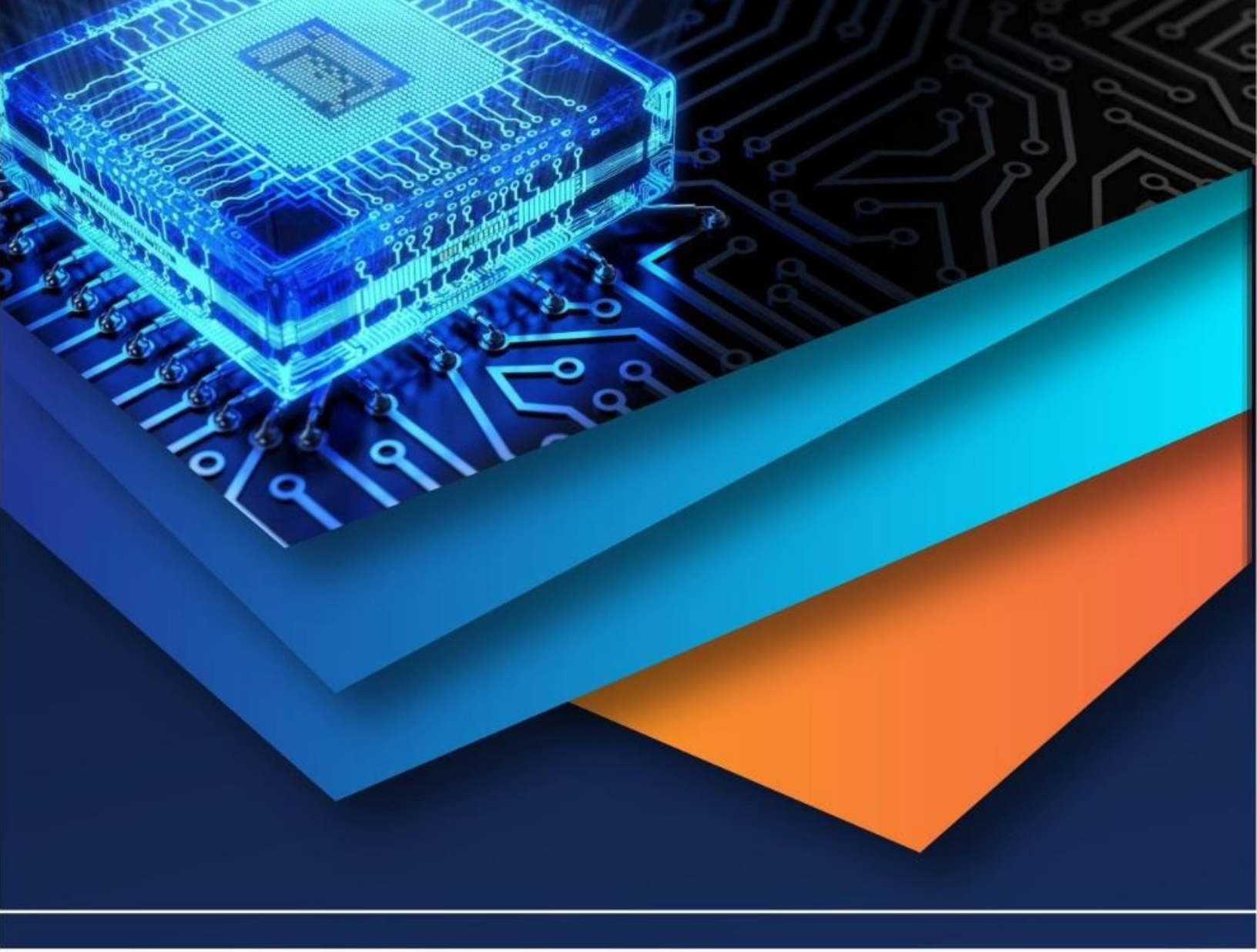

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