

Accident Alert System

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Abstract- Accidents threaten human lives more and mainly road accidents are more common today. No one can predict when and how it will occur. Nowadays-even accidents are happening even for standing vehicle by the other one, which is in move .Accident Alert System (AAS) is quite a novel research area. In order to avoid such collisions we have designed the system called “accelerometer based accident alert system”.

This Project presents an automotive localization system using GPRS and SMS services. Many lives could have been saved if the required attention was given at the time of need. With the help of this system, the required attention can be given to the victim as the intelligent accelerometer fitted into the systems alerts the nearby police stations and hospitals.. The system permits localization of the automobile and transmitting the position to the dear ones using GSM technology at his/her request. This system is also provided with emergency switch which can be turned off manually if the victim no longer requires help. Also once the force on accelerometer crosses the require limits, the siren is generated around 2 km area, which is heard by passersby to provide help to the victim at the time of need. . Now the world of wireless has inspired an entirely a new way of managing and minimizing the death rate due to auto crash. The scene of a fatal accident is always a theater where man and technology face the ultimate test. Whether the emergency is fire, earthquake or flood, relief or needed medical attention in this case, the stakes are always high.

Keywords – GPRS (General Packet Radio Service), GSM (Global System for Mobile Communication), Accelerometer, Embedded system(any one programming language), Messaging to dear ones.

I. INTRODUCTION

As the statistics of accidents are viewed, we can see that the accident are increased day by day. This Project describes a design of effective alarm system that can monitor an automotive / vehicle / car condition in travelling. The project name “ACCIDENT ALERT SYSTEM” shows that project is designed to prevent the accident and to inform emergency about an accident that has occurred.

The main objective of the system is to provide help and need for the vehicle user and also detects the accident if occurred and informs the respective authority through wireless technologies such as GSM and GPS. Vehicle Crash alert system is used to recognize the location of the accident and easily to reach the location.

Every second is valuable for the ambulance. The sensors are immediately triggered as soon as the crash takes place. There is no loss of life due to the delay in the arrival of the ambulance. The purpose of the project is to find the vehicle where it is and locate the vehicle by means of sending a message using a system which is placed inside of vehicle system Most of the times we may not be able to find accident location because we don't know where accident will happen. In order to give treatment for injured people, first we need to know where the accident happened through location tracking and sending a message to dear ones and at the same time siren is generated.

II. PROPOSED SYSTEM

New generation of cars are improved in such a way that the number of accidents decreases. Innovative ideas has implemented and emerged in order to reduce the risk of accident. During the recent past years, some alarm system and intelligent controlled apparatus have been designed and developed in order to increase the safety of automobiles. Security in travel is primary concern for everyone. This Project describes a design of effective alarm system that can monitor an automotive / vehicle / car condition in travelling. The project name “ACCIDENT ALERT SYSTEM” shows that project is designed to prevent the accident and to inform emergency about an accident that has occurred. This project uses a ACCELEROMETER that detects that accident has occurred and then generates siren and also with the help of GSM notification is sent to dear ones. These sensors send a signal to microcontroller.

The proposed system can be used in any kind of vehicle. When the accident takes place, the alert is automatically sent to the nearby police stations and hospitals for the immediate help but in the existing system the victim has to manually press the sensor and call for help which is not practical incase he is seriously injured. The existing system doesn't generate any siren to get assistance from the passerby. Also, Our system is an affordable one. Accident alert system makes use of pressure sensors, to sense the accident. Accident alert system also makes use of GPS(Global Positioning System) to get the information regarding the place of accident and which is further used to notify nearby police stations and hospitals for emergency care.

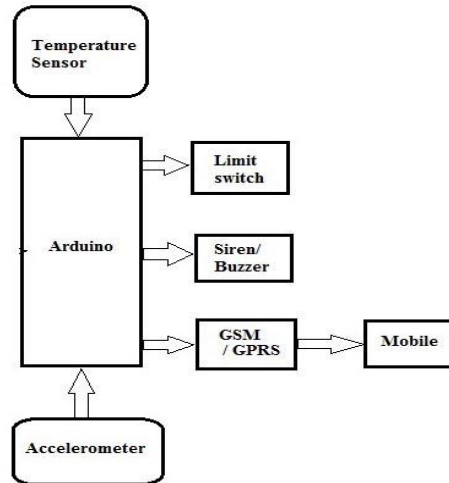
III. METHODOLOGY

The Prototype of this Accident Detection and information passing technique uses the following steps:

If any crash is happened then limit switch sends the data to gsm/gprs. Through that it sends message to their dear ones.

Temperature switch is to read the engine heat. If It gets over heated than usual then it send alert. Because due to this also many cars got blasted in summer season.

The complete setup is depicted in the form of block diagram as follows:



IV. HARDWARE COMPONENTS USED

4.1 GSM – Global System for Mobile Communication:

In this paper GSM helps in controlling the DC motor, stepper motor, Temperature sensor and solid state relay by messaging schemes. This scheme helps in reducing the need of manual systems which are time consuming and not efficiency for usage. But the proposed system is fully automatic and can function without any manual interruption. Hence this automatic system is more efficient and less expensive and more convenient to use from were ever possible. Hence can be preferred mode of communication for controlling purpose.



Figure 4.1 GSM module SIM900

4.2 ARDUINO MEGA

The Arduino Mega is a microcontroller board based on the ATmega2560. It has 54 digital input/output pins (of which 14 can be used as PWM outputs), 16 analog inputs, 4 UARTs (hardware serial ports), a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed 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. Never fear for accidental electrical discharge, either since the Mega also includes a plastic base plate to protect it!

The Mega 2560 R3 also adds SDA and SCL pins next to the AREF. In addition, there are two new pins placed near the RESET pin. One is the IOREF that allow the shields to adapt to the voltage provided from the board. The other is a not connected and is reserved for future purposes. The Mega 2560 R3 works with all existing shields but can adapt to new shields which use these additional pins.

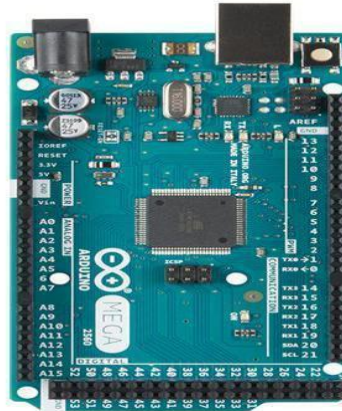


Figure 4.2 ATMega2560 Microcontroller

4.3 ADX SENSOR:

Breakout board for the 3 axis ADXL335 from Analog Devices. This is the latest in a long, proven line of analog sensors - the how the accelerometers. The ADXL335 is a triple axis MEMS accelerometer with extremely low noise and power consumption - only 320uA! The sensor has a full sensing range of +/-3g. There is no on-board regulation, provided power should be between 1.8 and 3.6VDC. Board comes fully assembled and tested with external components installed. The included 0.1uF capacitors set the bandwidth of each axis to 50Hz.

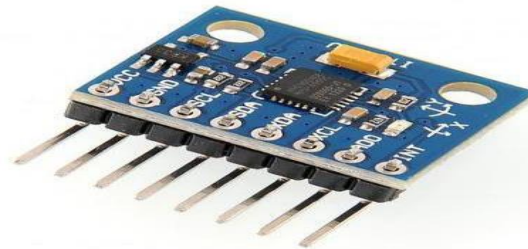


Figure 4.3 Accelerometer Sensor

4.4 TEMPERATURE SENSOR:

LM35 is a precision IC temperature sensor with its output proportional to the temperature (in $^{\circ}\text{C}$). The sensor circuitry is sealed and therefore it is not subjected to oxidation and other processes. With LM35, temperature can be measured more accurately than with a thermistor. It also possess low self heating and does not cause more than 0.1 $^{\circ}\text{C}$ temperature rise in still air. The operating temperature range is from -55°C to 150°C . The output voltage varies by 10mV in response to every $^{\circ}\text{C}$ rise/fall in ambient temperature, i.e., its scale factor is 0.01V/ $^{\circ}\text{C}$.

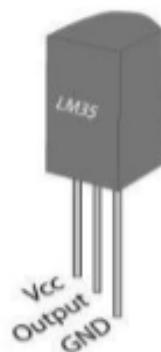


Figure 4.4 Temperature Sensor

4.5 LIMIT SWITCH:

A limit switch detects the physical movement of an object by direct contact with an object. If the limit get exceeds then it detects a movement and send it to the device. Through which GPRS sends the message.



Figure 4.5 Limit Switch

4.6 BUZZER:

The buzzer is ideal when you need to fit a buzzer in a small place. It has its own built-in drive circuit. It offers low power consumption. Used in manufacturing applications such as laptops, alarms, etc.

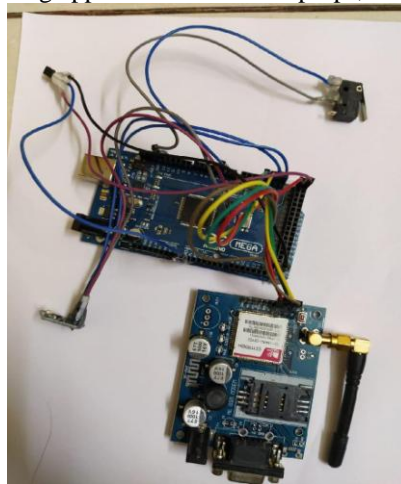


Figure 4.6 Hardware Implementation of Accident alert system

POWER SUPPLY:

A power supply is an electrical device that supplies electric power to an electrical load. The primary function of a power supply is to convert electric current from a source to the correct voltage, current, and frequency to power the load. As a result, power supplies are sometimes referred to as electric power converters.

V. SOFTWARE COMPONENTS USED

Arduino Program
Google Maps

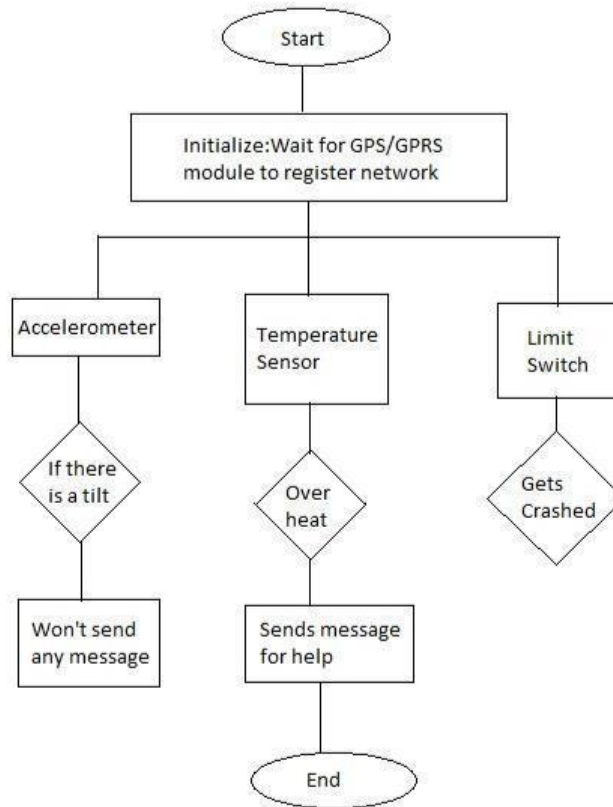
VI. IMPLEMENTATION

SEQUENCE OF ACTIONS:

- Initially the system is initialized with power supply.
- If the force on accelerometer exceeds the specified limits, the siren is generated.
- If the accident is not severe, then the victim can manually stop the button.

FLOW CHART:

Otherwise the notification is sent to dear once with the help of GSM and GPRS and mobile device.



VII. CONCLUSION

The rate of accident deaths could be reduced by improving emergency medical services. These services are entirely dependent on the speed of information transfer about an accident. The technological advent can solve this issue and stop the deaths of people. The accident alert system is one such system which can alert the relatives and the emergency services about the accident and thus save valuable life. Main motto of the accident alert system project is to decrease the chances of casualties in such accident. Whenever accident occurs, paramedics are alerted and they reach the particular location to increase the chances of saving life. This device invention is much more useful for the accidents occurred in deserted places and those occurring at night time which usually goes unattended. This system will have broad application prospects and it will play an important role in day to day life in future.

VIII. APPLICATIONS

Recovery of stolen vehicles With help of RF id when the vehicle is stolen, locating and Recovery of the vehicle is possible.

Group Management ,the car providing more optimal results to detect accidents. The proposed system can also be used for traffic estimation and system performance estimation to prevent loss of life to its maximum.

IX. ADVANTAGES

- This system is an immediate aid system.
- Monitors all hazards and threats.
- Alert messages are sent to the nearby hospitals and police stations.
- It is an affordable system.
- Can be used in any kind of vehicle.
- The alert message regarding the accident is automatically sent.
- This system can be used for a social cause.
- It does not need any operation manually.

X. FUTURE WORK

The proposed system deals with the detection of the accidents. But this can be extended by providing medication to the victims at the accident spot. By increasing the technology we can also avoid accidents by providing alerts systems that can stop the vehicle to overcome the accidents.

XI. REFERENCES

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