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Resolving Accident Detection Using Vehicletracking Information System

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ABSTRACT

Recently due to technological and population development, the usage of vehicles are rapidly increasing and at the same time the occurrence of accident have increased. Hence, the value of human life is ignored. The improvement of science and technology has led to many changes in the way of life. When an individual riding his/her vehicle, meets with an accident at remote place and especially during night hours, there is a chance that the individual may suffer from a serious injury and there is no one around to help him. In this regard, we have attempted to design an embedded application, which takes the responsibility of detecting the accident by using various sensors and informs to the authority/friend/family members about the incident. The system acts as an accident identification system that gathers and sends the vehicle information that met with an accident, and conveys it to the nearest control room.Road accidents constitute the major part of the accident .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.Therefore, GPS has become an integral part of vehicle system. This proposal shows how to utilize the capability of a GPS receiver to monitor speed of a vehicle and detect accident based on send accident location to an Alert Service Centre.

Keywords: GPS(Global positioning System), GSM(Global System Mobile)

I. INTRODUCTION

In this Era, we generally communicate with different persons situated in other parts of universe, within no time with leading technology known as cellular technology. The usage of mobiles nowadays increasing in such a manner where every individual carry their own mobile handset, thus proposed work is based on GSM technology which provides safety system in the form of accident detection.

Present world there is a dynamic increase in the world of vehicles. It seems to be like usage of vehicles increased more compared to past years, so there is high demand in purchasing of vehicles, which relatively increases the traffic hazards and road accidents.Thus increase in count of automobile leads to unexpected things (accident) so every individual life is under risk which then results in loss of human life mean time, if any accident happened and if there is unavailability of immediate safety facilities/measures an individual can avail then no problem but if not solved to resolve the same we have come up with an idea to overcome accident prevention and after accident also how to communicate to the nearest location like police control or hospitals. Therefore, at that situation the consequences can be concentrated. Our Proposed system makes an effort to provide the emergency facilities to the victims over a period. In huge organizations, drivers make illegal use of the vehicles, which may result in financial, time loss of the organisation. Apart from these purposes,

thisconceptcanbe preferred for tracking of stolen vehicles and vehicular sales etc.

II. LITERATURE SURVEY

N. Watthanawisuth et al [1] has designed a system using accelerometer and GPS tracking system to monitor the accidents. The components include an accelerometer, microcontroller unit, GPS device and GSM module. As accident occurs, the wireless device will send mobile phone short message indicating the position of vehicle by GPS system to family member, emergency medical service (EMS) and nearest hospital.

Hoang Dat Pham et al [2] presented GPS and GSM systems to track down the vehicle more effectively. The vehicle location can be obtained in form of Coordinates, which can be transmitted using GSM modem to the relevant person's mobile phones.

According to the research done by Rashida Nazir[3] et al described the use of SONAR to prevent accident. GPS module helps us to locate the 99accident locations in terms of latitude and longitude and GSM module is used to send the message on mobile.

In present situation, in remote areas, we cannot detect where the accident has occurred and hence no information related to it, leading to the death of an individual. The research work is going on for tracking the position of the vehicle even in dark clumsy areas where there is no network for receiving the signals. In their work GPS and has insisted for tracking the position of the vehicle, GSM is used for sending the message and the ARM controller is used for saving the mobile number in the EEPROM and sends the message to it when an accident has been detected. Hence, with this project implementation, detecting the position of the vehicle where the accident has occurred is easy, so that we can provide the first aid as early as possible.

S. Sonika et al [4] has expressed suggested the possible shortest path thereby reducing the chances of getting the ambulance stuck in the traffic. This reduces the time lag by making use of RF technologies that controls the traffic signals. At present criteria, in remote areas, we cannot detect where the accident has occurred and hence no information related to it, leading to the death of an individual. The research work is going on for tracking the position of the vehicle even in dark clumsy areas where there is no network for receiving the signals

Sri Krishna Chaitanya Varma et al [5] explained that if an accident happens, the impacted side of the vehicle is found by the impact sensors. After collecting all information which is stored in internal memory, controller sends this data to base or surveillance unit via SMS using GSM modem.

III. IMPLEMENTATION

Our accident detection and vehicle tracking information unit consists of different sensors like vibration sensor, accelerometer and modules like GPS, GSM, SMPS, LCD, Arduino Uno, relay control unit etc. to perform various operations of the project. All the interconnections between different modules and sensors, whichhave been done according to the circuit diagram. The circuit requires 3.3V, 5V and 12V for the operation of different modules.

Control unit consists of a transistor switch who isinON and OFF condition depends on the binary combination outputted from microcontroller. In normal condition, microcontroller will send a 0 (low) on the control line, which will switch off the transistor and the relay connected with the collector circuit will be in the non-excited condition. When any one of the abnormal condition occurs, microcontroller sends 1 (high) on control line which switches on the transistor and excites the relay coil. In this condition, the buzzer or any equivalent device can be turned off or on depending on the

requirements of the project by connecting either to NC or NO.

Microcontroller Atmega328A is the heart of our system, which is a single chip microcomputer with I/O ports, timer, clock generator, data memory, program memory, stack, ADC and serial ports etc. It is a 28 pin DIP IC which can be used for many control application like cameras, motor speed control, waveform generation, musical tone generation, printers, monitors, UPS, etc. The software of the project is written in (high-level language) embedded C and code is uploaded into chip using open source software Arduino IDE 1.8.5.

A 16 x 2 LCD display is utilized to display the status of operation, data values, names of parameter etc. It requires less hardware and consumes less power when compared to LED display. It is used to display the location and status of operation etc. Buffer is used to increase the current capacity. In our project, we have constructed this driver unit by using an NPN low power transistor BC547. The output of micro controller is connected to input pin of buffer IC. A relay is a simple **electromechanical switch** made up of an electromagnet and a set of contacts. Relays are amazingly simple devices.

Accelerometer is used to check the tilt condition. We are using ADXL 345 in our application it has three outputs X Y Z which are given to analog input pins of Arduino to convert analog into digital. The digital values are stored in memory and then compared with reference values to take correct decision. GSM is global communication unit, whichis used to send information to the authority during the accident. We use AT commands to send the short message to the authority. It works with 3.3. V supply and send ASCII data using serial communication. MAX 232 chip is used to convert RS232 to TTL logic voltages and vice versa. GPS unit is used to identify the location using altitude and works with serial data transmission at 9600-baud rate.

IV.BLOCK DIAGRAM

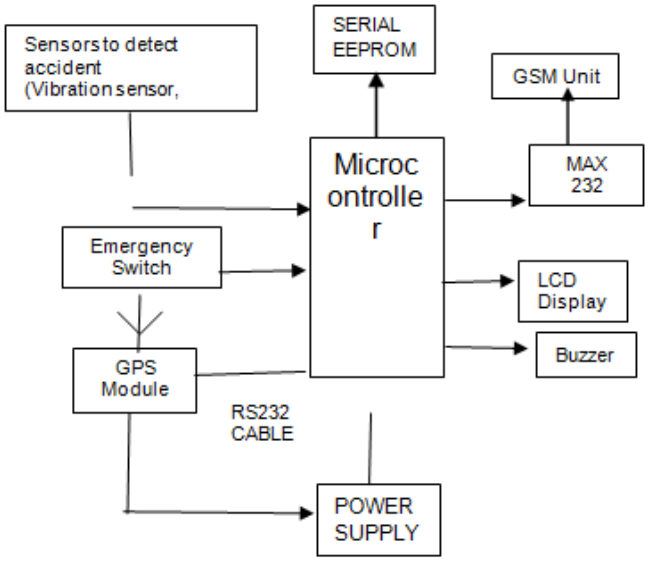

Figure 1

V. RESULTS

Thus, by implementing all the modules we achieved the results as the coordinates (latitude and longitude)of the accident victim using the unit based on our implementation as shown below.

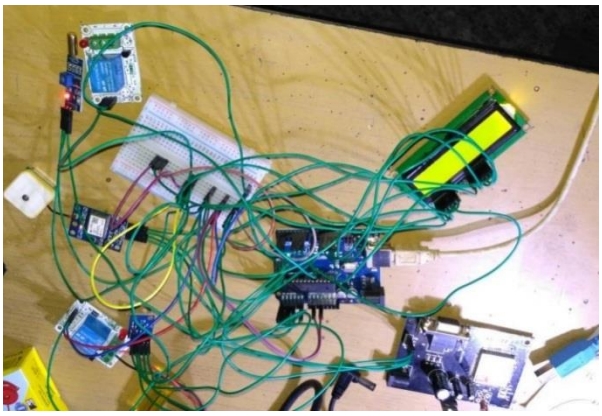

Figure 2. Final System model

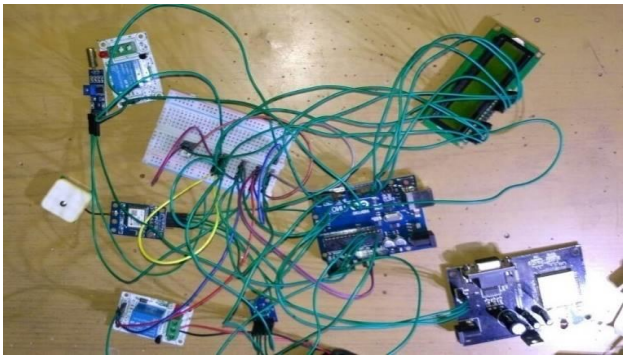

Figure 3. Interfacing of GSM and GPS with Arduino

Proposed system is better than other existing system as it gives the exact location of the accident happened and it sends theaccident's information to the required authorities and family.

VI.CONCLUSION

The designed vehicle for accident detection and tracking system by using GSM and GPS. When accident occurs, it senses by sensors. The coordinate of location of accident obtained by GPS, are sent via GSM network to the authorities. It is the fact that implementation of system will increase cost of vehicle but it is better to have some percent safety rather than having no percent of safety. This method is verified to be highly beneficial for the automotive industry. The proposed system can also be used for traffic estimation and accidents survey in the country by health department with slight modification. Hence, this concept can be extended to other automobileSectors. As well, it can also be implemented in trains.

VII. REFERENCES

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