

Smart Accident Detection and Emergency Braking Systems for Vehicles

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Abstract

Now a day's most are busy with their regular activities like their jobs, parties, vacations, text messages, Facebook, new relationships, nobody is prepared to seem what's happening around them. In India, an accident happens every 60 seconds and each minutes, to be precise, a road mishap snuffs out a life some are often saved if the victim has been given medical aid as soon as possible. This is often an intention to develop: Smart Accident Detection and Emergency Braking Systems for Vehicles this technique has been developed and implemented using the smart sensors and LPC2148 controller. This technique decreases the speed when it detects any vehicle or collision particle to avoid accident, if the accident is occurred then this technique immediately transmits the situation of the accident and vehicles condition to the emergency care centre telephone number through Short Message Service (SMS) additionally, to the present this technique sends a SMS if it detects fire accident or vehicle is flipped. With this an extra option is provided which activates the alarm system. When the accident occurs alarm is set. This is useful when the accident occurs outside the village. Also emergency help button is provided for emergency situations.

Keywords— Accident avoidance, accident detection, SMS

I. INTRODUCTION

India ranks worst in road accidents. A supportive legal framework is the need of the hour for good people who provide emergency medical care to road accident victims in order to shield them from unnecessary legal complications According to the World Health Organization, there are about 1.35 million deaths and 20-50 million injuries as a result of the car accident globally every year Especially, a certain proportion of deaths and injuries are due to untimely treatment and secondary accidents which results from that rescue agency and vehicles around accident cannot obtain quick response about the accident. Therefore, it is important to develop an efficient accident detection method, which can significantly reduce both the number of deaths and injuries as well as the impact and severity of accidents the main target for this project is to provide immediate help to the victims when the accident occurs.

The braking circuit is to brake the car automatically after received signal from the sensor, in this system a relay is shown to indicate the working. Along with the ultrasonic sensor we are also using alarm system which detects the accident occurrence and the co-ordinated of the accident are messaged to the rescue team

II. RELATED WORK

[1] "CAR ACCIDENT DETECTION SYSTEM USING GPS AND GSM" International Journal of Engineering Research and General Science Volume 3, Issue 3, May-June, 2015 ISSN 2091-2730 We have achieved greater performance and robustness by implementing and optimizing our proposed system. The design of Crash Detector Embedded Unit was bit tricky as we had to increase the accuracy while cutting down the total cost. The system uses the low power components in order to save the battery power which may be used for some other critical tasks. Sensors and other components used in our system is distributed throughout the car hence provides more flexibility while mounting into the vehicle. Using the open source android adds advantage as we can work on top of some already built APIs for GPS and GSM interfacing hence decreasing completion time. As we can say we have increased the system performance from every perspective which we could. The given system can also be used for traffic estimation and accidents survey in the country by health department with slight modification as stated above

[2] "Wireless black box using accelerometer and GPS tracking device for accidental monitoring of vehicles" by Watthanawisuth,N., IEEE conference in Jan, 2012 This survey presents an overview of wireless black box using MEMS accelerometer and GPS tracking system is developed for accidental monitoring. The system consists of cooperative components of accelerometer, microcontroller, GPS device and GSM module. After the accident occurs, this 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. The threshold algorithm and speed of motorcycle are used to determine the accident in real- time. The system is compact and can be easily installed under the seat of the driver. The system has been tested in real time applications using bicycles. The test results show that it can detect linear fall, non-linear fall and normal ride with great

accuracy . [3] B.Rani, R. Praveen Sam, Govardhan Reddy Kamatam3 “Vehicle Tracking and Accident Detection System using Accelerometer” International Journal of Applied Engineering Research ISSN 0973-4562 Volume 13, Number 11 (2018) : The rapid growth of technology and infrastructure has made living easier. The advent of technology has also increased the traffic problems and the road accidents take place frequently, which causes huge loss of life and property because of the poor emergency facilities. Even with so many systems and devices present in the field of vehicle design, road lane design and heavy traffic control accidents do occur at a large scale. Accident threatens human lives more and mainly road accident is common nowadays. During accident many people lose their life because medical services and family member not getting accidental information on time and the location also is difficult to track. When the accident is detected of any kind it will automatically sent as an alert to the required destination using this system. Accident detection device installed in a car when meets with an accident will send SMS to the pre-install numbers of the drivers family members, police station, ambulance and nearest hospital. This embedded system is very useful for tracking and retrieving the exact position of the vehicle, which has met with an accident by using Global Positioning System (GPS) and sensors.

III. PROPOSED WORK

The Intelligent accident identification and location display system working is same as flow chart shown above. When the driver starts engine “VEHICLE TRACKING” message is displayed. While moving if it detects a vehicle or any other objects it will decrease turn the led on connected to relay, After the accident occurred then vibration sensor will activate the GPS to locate accident area. GSM sends the location and persons heart beat status to the emergency number feed in the GSM module and optional mobile number stating that ACCIDENT OCCURRED. In addition to that it will send a message to emergency number feed in system when the vehicle is flipped or detects the fire. Also, a buzzer is provided, so that the local people come to know about the accident. HELP button is also provided in case the driver faces any difficulty in the journey he can press the key. After the key is pressed the location of the vehicle and “HELP” message is sent to mobile number.

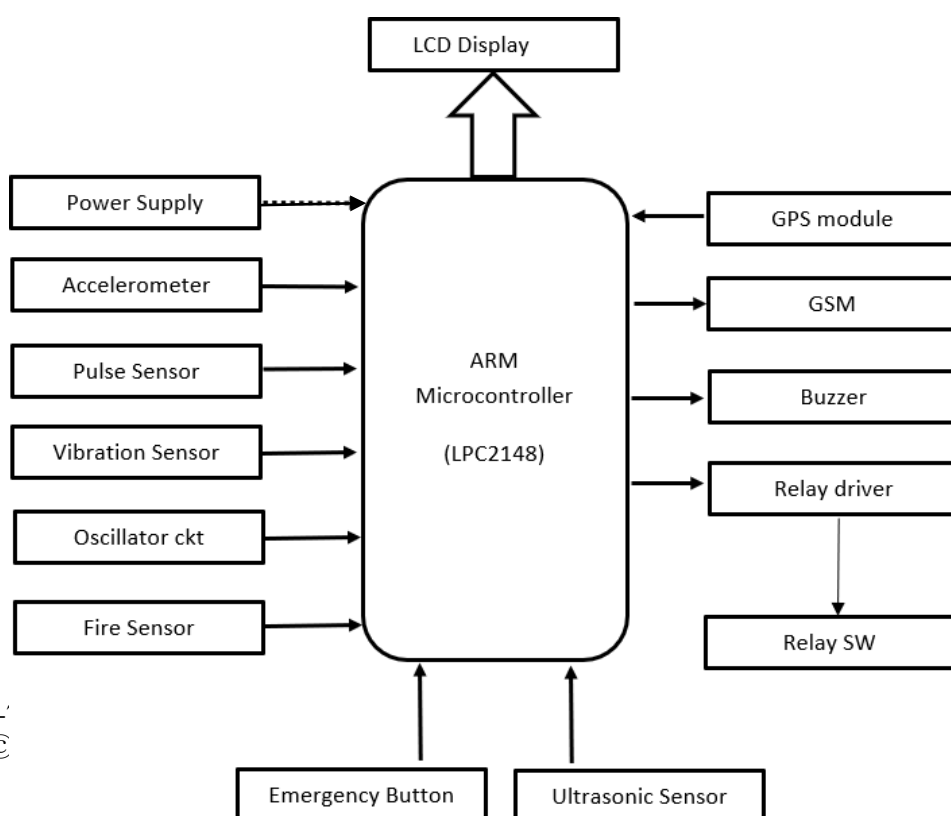
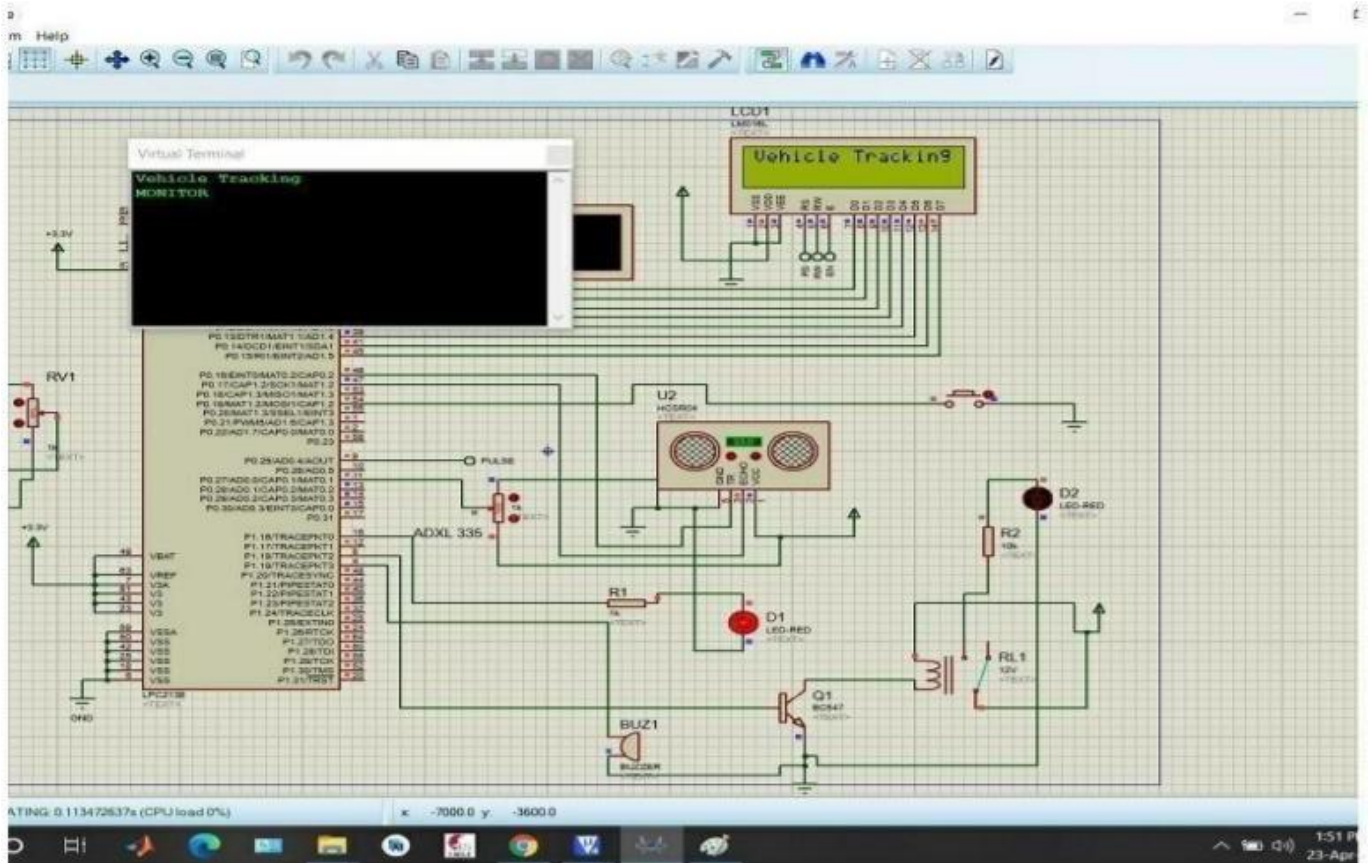


Fig. 1 Block Diagram of the system

IV. IMPLIMENTATION OF THE PROPOSED SYSTEM

This is the design of the project. When the car is started the system is activated. When the system is activated, a message is displayed on the LCD. The message displayed is “VEHICLE TRACKING”. Also, THE sensors are activated. When the object or obstacle is detected by the



ultrasonic sensor the signal is sent to relay. After the accident occurs the vibration sensor is activated the information from all the sensors is sent to the emergency number with the help of GSM.

Fig. 2 Simulation of the system

V. PROPOSED RESULTS

Activity	Result
Detection of the object	10cm
Location of the system	Around 50 m
Time required to transfer the information	5 sec
Detection of fire	1m

The system will detect the object when it is 10 cm away from the object. After the detection of the accident by vibration sensor flame sensor will detect the fire within the 1m radius. Also the GPS module sends the location of around 50 meters to the emergency number in the GSM module. Time of 5 sec is taken to transmit the information.

VI. ADVANTAGES

Emergency help provided. System provides the exact location of the accident. Heartbeat of the

victim can be monitored. To get the condition of the vehicle after the accident occurs. Accident alerts are given to the nearest control station on the first moment of collision. Accident alerts are given to the emergency number feed in the system the very first moment of collision. A message will be sent to a selected contact to inform about the accident. The alert message will include the GPS location so that it will be easy to track the location on map.

VII. APPLICATION

The system can be used in military as it is safe. This system can be used in Ambulance for detecting the accidents. This system can also be used in school bus, vans for tracking. This system can be used for transport vehicles.

CONCLUSION

In the paper we defined a complete solution for detecting the accidents that occurred on roads and provide immediate help. In this system initially we try to avoid accidents which occurred due to adverse weather conditions like dense fog etc by decreasing the speed, even though the accident occurred the vibration or MEMS sensor will activate the GPS to find the location and further SMS will send to the emergency number feed in the system. This will reduce accidents as well as human death ratio by accidents due to providing proper care within time frame. We also added fire sensor to detect fire accidents. Thus this system will provide an important information about the accidents, however such prompt system is not available in the country. For future enhancement we can use this as per user need. This system would be designed in such a way that if the fire is detected by fire sensor this will automatically send the condition to the emergency number. Moreover, this system can be designed to reduce the time required to provide help to the victim.

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