International Journal of Scientific Research in Computer Science, Engineering and Information Technology
© 2017 IJSRCSEIT | Volume 2 | Issue 3 | ISSN : 2456-3307

Automatic Accident Detection System through Smart Phone

Rajnandini Singh[1], Safiya Khan[2], Vanya Dubey[3], Ashutosh Sah[4], Shabina Begum[5], Richa Shrivastava[6]
UG Students[1,2,3,4,5], Asst. Prof [6], Department of Electronics & Telecommunication,
RSR-RCET, Bhilai, Chhattisgarh, India

ABSTRACT

The largest cost of unnatural deaths in the world today (apart from diseases) is road accidents. With increase in population and thus in the number of vehicles, accidents are only going to increase. Most of these deaths are due to delay in medical attention to the injured. The major cause of this delay is lack of intimation or delayed intimation of the accident to emergency medical response authorities. This can be addressed by the system proposed. This system uses a Bluetooth device, switch along with a microcontroller to report an accident. This system also incorporates a "panic switch" which when depressed will send a text message for help to stored numbers. This facility provides assistance in the case of some chronic medical condition like heart attack or robberies that are increasing on highways.

Keywords : Accident Detection System, Liquid Crystal Display, Messaging Circuit, NHTSA, SONAR, NAND, SMS, GSM

I. INTRODUCTION

Driving may be the most dangerous activity with which we are involved. According the most recent USDOT records, at the end of 2003, vehicle-related crashes in the U.S. exceeded 6 million with 3 million injuries and 42,643 deaths [NHTSA, 2004]. Based on a 2000 study of Crash Costs performed by the National Highway Traffic.

Safety Administration (NHTSA) [Blincoe et al., 2002] and extrapolating for 2003, the total cost from the aforementioned crashes was in excess of $240 billion. In the state of Minnesota alone, during 2002 (latest available data), 94,969 crashes occurred, resulting in 40,677 injuries and 657 deaths [Mn/DOT, 2003]. Minnesota ranks low in the national statistics for road crashes, while the U.S. is fourth in the world in number of crashes per 100,000 people [BASt, 2003].

II. METHODOLOGY

A. Switching System

The designed circuitry consist of five SONAR ranging modules from which four modules placed at the corners of the vehicle to keep an eye on the blind corners and one at the front of the vehicle. This SONAR is used to determine the exact position of the obstacle and gather range information from all around the vehicle. SONAR emits short, high frequency sound pulses at regular intervals. The minimum detection distance which ranges between 15 cm to 35 cm [7]. When the distance is less than this range, an alarm turns "ON" so that the driver get beware of accident.

B. Initialization of Messaging Circuit

This system will be installed in the vehicle. LCD (Liquid Crystal Display) is attached adjacent to dash board from where the proper working condition of the system can be observed. The system will start automatically when the vehicle is ignited. The circuit will get power supply from the battery of vehicle and we can use separate battery too. Total voltage needed for circuit is 1 V voltage regulators are used for distribution of supply voltage.GSM needs 4.2 V for operation. LM317 with the combination of a resistor and regulator knob is used for providing the desired voltage which is needed. 5 V are needed for operation of LCD, GPS, Microcontroller.

C. Detection

Vibration sensor is connected with microcontroller through 7400IC. When collision of vehicle occurs, vibration sensor will sense the immense vibration. One of the inputs of NAND gate will goes high. It sends interrupt to microcontroller.

D. Transmission of Information

When Microcontroller will receive interrupt it will enable the GSM modem. It will send SMS on predefine numbers already store in microcontroller. When information will send through message "sending SMS (Short Message Service)" statement will be showed on LCD.

III. RESULT

An automatic accident prevention and reporting system is designed and implemented using wireless technologies like HC-05 to prevent accident. Bluetooth for sending message on mobile at the receiver end. As we conclude our paper here along with the entire stimulus, we are still willing to upgrade the application of enhanced technology for the electronic equipment usage efficiency.

The snapshot indicates the messages alerts when our accident alert system is tested at two different locations near to one another. Hence, there is a small variation in the coordinates, the initial value of latitudes and longitudes are same but the fractional value changes with small difference. The first SMS shows that the testing accident has occurred.

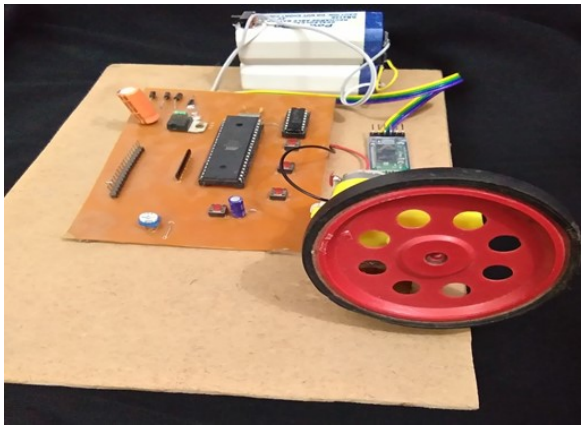

Figure 1: Model Diagram

Figure 2: Home page

Figure 3: Snapshot of accident detection

Freeway crashes are the main source of non-recurring congestion. Finding ways of reducing them is critical for improving freeway operations and lowering costs to the traveling public without having to provide new capacity or major reconstruction. Because of this, recent efforts are focused towards the identification of traffic conditions leading to crashes. This combined with detection schemes based on real-time traffic measurements can be used in the development of interventions aimed at reducing crash occurrence. So far such attempts are limited to associating general traffic conditions with crash occurrence over a large area i.e., an entire freeway.

However, evidence suggests that a large number of crashes accumulate in a few, short, high crash freeway

sections. This implies that such locations differ considerably from the norm regarding the traffic conditions associated with crash likelihood. The work described in this document focused on detecting crash prone conditions at high crash freeway sections based on information collected by state of the art sensor technology.

This was accomplished by developing models/algorithms for real time estimation of crash likelihood. Although the models/algorithms developed apply only in the high crash area considered, the methodology developed here as well as the traffic metrics identified are general and can be replicated in other freeway high crash areas.

IV. CONCLUSION

In this chapter we attempted to offer some insight about possible solutions to this particular high crash area. The solutions target two out of the three identified crash causal factors. Each invention needs to be researched in detail before implementation because there is always the possibility of creating more problems than it solves. We believe that currently we lack the proper tools to investigate, measure and visualize such solutions therefore creating these tools has priority over the creation of expensive crash prevention solutions. One area of intervention that was not discussed in this chapter involves permanent geometric changes in the roadway design to influence/eliminate the crash causal factors. Such solutions can include entrance redirection or closure, extra lanes, and others. Even such hard solutions cannot be guaranteed without proper investigation using a microscopic simulator capable of emulating in detail the identified crash causal factors.

V. FUTURE SCOPE OF WORK

The project presence vehicle accident detection and alert system with SMS to the user define mobile numbers. The GPS tracking and GSM alert based algorithm will further design and implement in this project. With LPC 2148 MCU in embedded system domain. The proposed vehicle accident detection system can track geographical information automatically and sends and alert SMS regarding accident. Experimental work has been carried out carefully. The result shows that higher sensitivity and accuracy is indeed achieved using this project. EEPROM is interfaced to store the mobile numbers permanently. This made the project more user friendly and reliable. The proposed method is verified to be highly beneficial for the automotive industry.

VI. REFERENCES

[1]. Malik, A.S., Boyko, O., Atkar, N. and Young, W.F. (2001) A Comparative Study of MR Imaging Profile of Titanium Pedicle Screws. Acta Radiologica, 42, 291-293.

[2]. Khan, A.M. and Tehreem, A. (2012) Causes of Road Accidents in Pakistan. Journal of Asian Development Studies,

[3]. Thompson, C., Whit, J., Doughenty, B., Abnight, A. and Schmidt, D.C. (2010) Using Smart Phone to Detect Car Accidents and Provide Situational Awareness Emergency Responses. The 3rd International ICT Conference on Mobile Wireless Middleware Operating Systems and Applications.

[4]. Megalingam, R.K., Nair, R.N. and Pakhya, S.M. (2010) Wireless Vehicular Accident Detection and Reporting System. International Conference on Mechanical and Electrical Technology (ICMET).

[5]. Syedul Amin, Md., Bhuiyan, M.A.S., Reaz, M.B.I. and Nasir, S.S. (2013) GPS and Map Based Vehicle Accident Detection System. 2013 IEEE Student Conference on Research and Development (SCOReD), Putrajaya, 16-17 December 2013.

[6]. Varma, S.K.C., Poornesh, Varma, T. and Harsha (2013) Automatic Vehicle Accident Detection and Messaging System Using GPS and GSM Modems. International Journal of Scientific & Engineering Research,

[7]. Rana, U. Accident Prevention System. Department of Electrical Engineering, Lahore College for Women University.

[8]. Thakor, N., Vyas, T. and Shah, D. (2013) Automatic Vehicle Accident Detection System Based on ARM &GPS. International Journal for Research in Technological Studies..

[9]. Ramadan, M.N., Al-Khedher, M.A., Senior Member, IACSIT and Al-Kheder, S.A. (2012) Intelligent Anti-Theft and Tracking System for Automobiles. IEEE.

[10]. Mazidi, M.A. and Mazidi, J.G. The 8051 Microcontroller and Embedded Systems, Pearson Education, Prentice Hall Publication, Upper Saddle River.