International Journal of Research in Engineering, Science and Management
Volume-3, Issue-7, July-2020
journals.resaim.com/ijresm | RESAIM Publishers

Securitized Vehicle

S. Madhukara[1], Y. N. Latha[2], B. A. Gagana[3*], M. S. Anusha[4], V. N. Meghana[5]
[1]*Assistant Professor, Department of Electronics and Communication Engineering, S. J. C. Institute of Technology, Chikkaballapur, India*
[2,3,4,5]*Student, Department of Electronics and Communication Engineering, S. J. C. Institute of Technology, Chikkaballapur, India*
*Corresponding author: gaganagowda93084@gmail.com

***Abstract*: Accidents are one of the main causes of injuries and deaths worldwide. Now-a-days manipulations of accidents are occurring without having the evidences. In some conditions human beings cannot control the vehicle, due to which the confused situation occur and cause disaster. There should be more implementation of car accident detection system to reduce the number of deaths resulted from car accidents as a recent study suggests that rapid treatment and transportation of victim to the hospital in the shortest time can reduce fatalities by six-percent.**

Immediately after the accident occurred, the black box concept we used will gathers information from different sensors used in the vehicle that is used to check whether the driver is alcoholic, wore seat belt, engine temperature, and it captures the picture in four directions, send all those to registered mobile numbers of ambulance, police station and to the related family members through SMS within few seconds with the GPS location of the accident area using a smart android phone. Eye blink sensor used here detects the drowsiness of the driver and alerts them.

***Keywords*: Black box, Eye blink sensor, Ultrasonic sensor.**

1. Introduction

Traffic accidents are one of the main causes of death and injuries worldwide. Now-a-days manipulations of accidents are more. To give the information of accidents we are using black box in vehicles. If an accident occurs in any direction the photo will be captured, then it will check whether the person is an alcoholic, seat belt is worn or not and will check the Temperature of the engine. With the location, the information about the accident will be sent to a nearby police station, hospital and to a family member. So that manipulation will get reduced and police will get exact information of what had happened. This will reduce the investigation time and it helps to save the person's life. Here we are using a four-wheel robot as a car for demo purpose. About 33 percent of the accidents occur during the night instead of and also tend to have higher percentage of death, even the number of vehicles is very less compared to day. As per survey done by researchers the possible risk related to road accidents is double compared to the day time [5]. Drowsiness and Fatigue of drivers are amongst the significant causes of road accidents. Every year, they increase the amount of deaths and fatality injuries globally. Here for this we use eye blink he doesn't respond the vehicle will automatically slow down. We use ultrasonic sensor it will check if any obstacle is present or not then the vehicle automatically stop [6].

2. Problem Statement

Number of vehicles on the roads is increasing day by day, also there is an advancement of technology but the safety factor is always needed to be considered at the first. While driving vehicle on the road during the night as well as day time, a clear perception of the road and traffic is obligatory. The probability of accidents has been increased nowadays especially during night due to the heavy traffic and inappropriate night vision. This model concept will reduce the manipulation of accident occurred and saves a person life by informing about the accident to the nearby hospital and the concerned authority.

3. Block Diagram and Background

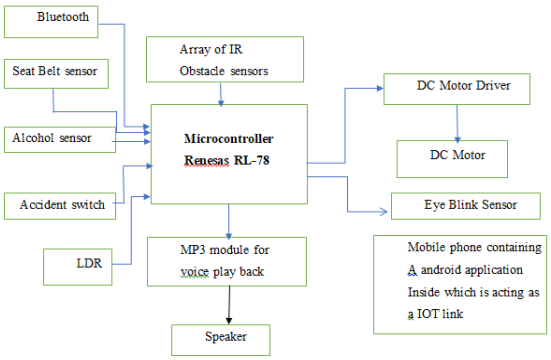

Fig. 1. Block diagram

The figure says that RL-78[R5F100LE] Microcontroller will play the major role as a controller of the devices. RFID include the internal control fixed assets, internal control expensed assets and theft prevention. This system involves tag and a reader. The RFID reader converts the radio waves to a more usable form of data. GSM modem requires a SIM card just like mobile phones to activate communication with the network. A GSM digitizes and reduces the data, then sends it down through a channel with two different streams of client data, each in its own particular time slot. The system has an ability to carry 64kbps to 120Mbps of data rates. MP3 module will generate the audio signals which

are received from the mobile phone. DC motor driver is a type of amplifier or power modulator that integrate between the controller and a DC motor. It will take a low current control signal and then turn it into a higher current signal that can drive a motor. four Arduino cameras are used in the car in four different directions, which will captures the picture after an accident. An infrared sensor emits and/or detects infrared radiations to sense its surroundings. The basic concept of an IR sensor which is used as obstacle detector is to transmit an infrared signal, this signal bounces from the surface of an object and signal is received at the infrared receiver.

A. Microcontroller- Renesas RL-78(R5F100LE)

The Renesas RL78 is a new generation of power-efficient microcontrollers that combine the excellent CPU performance of the 78K0R with the superior on-chip functions of the R8C and 78K. It delivers higher performance and lower power consumption than previous microcontrollers while enabling customers to utilize software resources developed for the R8C and 78K.

Fig. 2. Microcontroller- Renesas RL-78(R5F100LE)

B. MP3 Module

An MP3 player is an electronic device that can play MP3 digital audio files. It is a type of digital audio player, or portable media player. Most players play more than the MP3 file format, such as Windows Media Audio (WMA), Advanced Audio Coding (AAC), Vorbis, FLAC, Speed and Ogg.

Fig. 3. Mp3 module

C. Push Button Switch

A Push Button switch is a type of switch which consists of a simple electric mechanism or air switch mechanism to turn something on or off.

Fig. 4. Push Button Switch

D. Temperature Sensor [LM-35]

LM35 is a commonly used temperature sensor, It shows values in the form of output voltages instead of degree Celsius.LM35 shows high voltage values than thermocouples and may not need that the output voltage is amplified. The output voltage of LM35 is proportional to the Celsius temperature. The scale factor is .01 V/°C. One most important characteristic is that it draws just 60 micro Amps from its supply and acquires a low self-heating capacity.

Fig. 5. Temperature Sensor

E. LCD Display

A liquid-crystal display (LCD) is a flat-panel display or other electronically modulated optical device that uses the light-modulating properties of liquid crystals combined with polarizers. Liquid crystals do not emit light directly, instead using a back light or reflector to produce images in colour or monochrome.

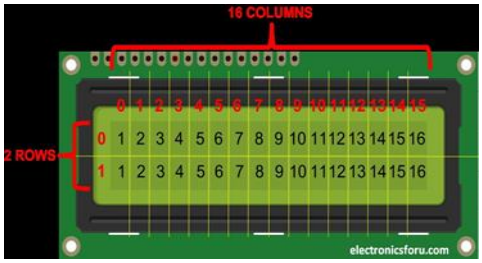

Fig. 6. LCD

F. Buzzer

A buzzer or beeper is an audio signaling device, which may be mechanical, electromechanical, or piezoelectric. Typical uses of buzzers and beepers include alarm devices, timers and confirmation of user input such as a mouse click or keystroke.

Fig. 7. Buzzer

G. Eye Blink Sensor

The LDR Sensor is used to detect the eye blinking. The eye blink is a sensor which is placed in front of the driver on the top. While in driving time the eye blink in normal means it checks when the eye close to particular second's buzzer will be indicated to alert him to wake up. The eye-blink sensor works

by illuminating the eye and eyelid area with infrared light, then monitoring the changes in the reflected light using a phototransistor and differentiator circuit.

Fig. 8. Eye Blink Sensor

H. MQ-3 Gas Sensor

MQ-3 module is suitable for detecting Alcohol, Benzine, CH4, Hexane, LPG, CO. Sensitive material of MQ-3 gas sensor is SnO2, which with lower conductivity in clean air. When the target alcohol gas exist, the sensor's conductivity is more higher along with the gas concentration rising. MQ-3 gas sensor has high sensitity to Alcohol, and has good resistance to disturb of gasoline, smoke and vapor. This sensor provides an analog resistive output based on alcohol concentration. When the alcohol gas exist, the sensor's conductivity gets higher along with the gas concentration rising.

Fig. 9. MQ-6 Sensor

I. Cube Suite + - C compiler

Integrated development environment Cube Suite (Cube suite) offers the ultimate in simplicity, usability, and security for the repetitive editing, building and debugging that typifies software development. Easy to install and operate, Cube Suite offers a highly user-friendly development environment featuring significantly shorter build times and graphical debug functions. The robust lineup of expanded functions and user support functions ensures a dependable environment for all users.

J. Embedded C

Embedded C is a set of language extensions for the C programming language by the C Standards Committee to address commonality issues that exist between C extensions for different embedded systems. Historically, embedded C programming requires nonstandard extensions to the C language in order to support exotic features such as fixed-point arithmetic, multiple distinct memory banks, and basic I/O operations.

K. Renesas Flash Programmer

The Renesas Flash Programmer provides usable and functional support for programming the on-chip flash memory of Renesas microcontrollers in each phase of development and mass production. A simple GUI makes operations easy, even for first-time developers. PC-controlled programming via the E1 emulator, E20 emulator, E2 emulator, E2 emulator Lite, a serial or USB connection Interoperation with other software. Programming a unique code to a designated area of flash memory. Enhanced security against theft through the encryption of program files Easier creation of projects (compared with V2).

L. Arduino IDE

It is an open source program that allows users to write and upload code within a real time work environment. It consists of both a physical programmable circuit board (often referred to as a microcontroller) and a piece of software, or IDE (Integrated Development Environment) that runs on your computer, used to write and upload computer code to the physical board.

M. Or CAD Captures

Or CAD is a suite of products for PCB Design and analysis that includes a schematic editor, an analog/mixed –signal circuit simulator and a PCB board layout solution. Design Reuse Easily reuse or retarget proven circuitry from the same design or across designs to save time and avoid errors. Intelligent Place and Route faster and more accurately with advanced Or CAD PCB routing technologies. In –design DFM Find and correct DFM issues during the design process and manage manufacturing rules in the familiar constraint manager. Interactive 3D Canvas View and analyze designs in 3D, cross probe between 3D and 2D views, and check collisions in 3D.

4. Applications and Advantages

A. Applications

- Mainly used in cars and heavy vehicles.
- Used for storing all information of aircraft during total flight.
- It is used in trains as an event recorder.
- We can use in trucks to avoid crashes.
- Used to alert a drowsy person to avoid accident.

B. Advantages

- Provide safe driving during bad weather conditions.
- Economical to be installed.
- Maintenance cost is low.
- Energy saving. It provides street crossing junction and cornering.

5. Results

The result of the topic is shown below.

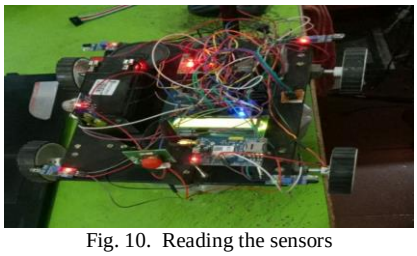

Fig. 10. Reading the sensors

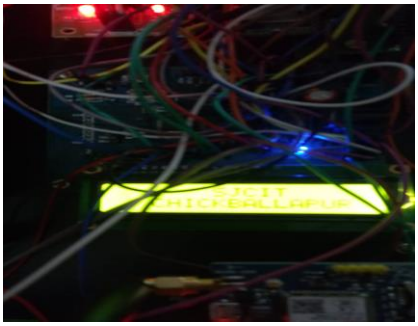

Fig. 11. LCD display

6. Conclusion

Now-a-days due to the advancement of Mobile Technology has resulted in the formulation of a various mobile application which helps the users in their day to day life. This ROBOT application aims to help Accident Investigators and Insurance Companies to perceive the cause of the accident. This will be supported by systems capable of automating many decisions to be taken from emergency services. It also reduces security risk and rescue time of the accident. The accident is indicated by the use of sensors and the location and intensity of the accident can be sent via SMS via Bluetooth of smart android phone. This will help investigators to speed up their investigation process and provide fast results.

References

[1] P. Connie, "Automatic Crash Notification: A Promising Resource for Fire EMS", fireengineering. Com, pp. 453-458, 2017.

[2] C. Minho, K. Gyogwon, S. Minseok y W. K. Sang, Wearable Device Based System to Monitor a Driver´s Stress, Fatigue, and Drowsiness, Vol 9 IEEE, 2017. pp.284-290.

[3] R. Kumar Singh, A. Sankar and R. Kumar Thakur, A Real Time Heart Rate Monitor Using Non-Contact Electrocardiogram for Automotive Drivers, 2016. pp.1123-1126.

[4] A. Mittal, K. Kumar, S. Dhamíja and M. Kaur, "Head movement-based driver drowsiness detection: A review of state-of-art techniques," India, 2016. pp.45-50.

[5] "Road traffic injuries", World Health Organisation. Published in 7th December 2018, pp.152- 175.

[6] P. Connie, "Automatic Crash Notification: A Promising Resource for Fire EMS", fireengineering.com, p. 453-458, 2017.

[7] F.M. Franczyk, and J. D. Vanstone, ―Vehicle warning system, Patent number: 7362239.

[8] S. J. Breckling, Ed., The Analysis of Directional Time Series: Applications to Wind Speed and Direction, ser. Lecture Notes in Statistics. Berlin, Germany: Springer, 1989, vol. 61.in 22 Apr 2008. pp. 567- 570.

[9] Khondker Hasan, Mashiur Rahman, Abul L. Haque, M Abdur Rahman, Tanzil Rahman and M Mahbubur Rasheed, Cost Effective GPS-GPRS Based Tracking System, Proceedings of the International Multi-Conference of Engineers and Computer Scientists 2009, Vol. 1, IMECS 2009, Hong Kong.

[10] P. Efstathopoulos, M. Krohn, S. Van De Bogart, C. Frey, D. Ziegler, E. Kohler, D. Mazieres, F. Kaashoek, and R. Morris. Labels and event processes in the Asbestos operating system. In Proc. of the 20th ACM Symposium on Operating Systems Principles, pp. 17-30. ACM, 2005. pp. 354-360.