

Safe Driving without using Mobile Phones

Mousami S Vanjale, Amruta Rothe, Chaitali Dahake

Department of Electronics Engineering

AISSMS's Institute of Information Technology, Pune, India.

Savitribai Phule Pune University

Abstract— Today human being safety while transportation plays vital role in reducing accidents. Safety measures are very effective in reducing numerous accidents. Also, at the same time cell phones affect the driver while driving automobiles. In this paper, we have developed a device which is portable enough to analyze and advise on safety conditions of automobiles while driving. Safe driving System without using mobile phones is designed by applying GSM technology & driver unit. It also receives a call automatically without touching the cell phone and automatically precedes three conditions, which we have introduced in this paper. The hardware includes GSM module, RS232, PIC18F452.

Keywords: PIC18F452, GSM.

I. INTRODUCTION

Cellular phones were first introduced in the United States in the mid-1980s, and their use has experienced explosive growth since then. Today each and every person around us possesses cell phone which reflects the widespread use of it. Recent surveys demonstrated that many people are in the influence of using cell phones while driving. Accidents are the outcome of this malpractice which we either read in the newspaper or see happening around us. It hardly matters whether the person makes use of hands free or hand-held phones. The use of cell phones distracts the driver and affects the driving in different ways. For example, driver forgets to adjust the speed according to the limit and so many other mistakes which directly leads to accidents. Hence, the drivers must take some compulsory safety precaution in conjunction with a cell phone call. Studies have shown that if people use some safety devices along with the cell phones while driving, they can avoid the risk of accidents to a greater extent. To prevent accidents due to the use of cell phones during driving, we have designed a model in our project. This prototype works in three steps which are:

- 1) When there is an incoming call on the driver's cell phone that is currently driving an automobile, the driver cannot attend the call.
- 2) If there is an emergency and the person calls again for the second time, the driver will get the voice message that "a particular person is calling and if you want to attend the call, please park the vehicle aside and attend your call".
- 3) The driver cannot attend the call until the vehicle which is in motion completely stops.

II. EXPERIMENTAL PROCEDURE

A. Literature Survey

Use of cell phones while driving has its adverse effects on road safety. Research shows that at any given moment during the day, about 1% to 4% of the drivers are using cell phones. Among all the road accidents, about 20% to 30% are because of the driver's distraction. The driver's distraction due to cell phone can happen in two ways:

- 1) Physical
- 2) Cognitive

In physical distraction driver has to operate cell phone along with the vehicle and in cognitive distraction driver has to divert his attention from driving to telephone talk as it is mentioned by authors of [1].

In [2], authors have described that using the cell phone while driving affects the driver's discipline in different ways like:

- 1) Driver misses exits
- 2) Fails to observe the traffic signal
- 3) Forgets to adjust the speed according to the speed limit

In this paper [2] authors have designed and implemented for the safe driving using cell phones with ARM7 and GSM module. To avoid the distraction, driver compulsory has to take some kind of safety precaution regarding a cell phone call. By using this system those problems are mostly reduced and that person can drive the vehicle safely.

Authors of [3] have designed a system for Cell phone usage while driving avoidance with GSM-RF based accident emergency alert system. Use of cellular phone leads to increase in road accidents while driving. In this project the author is providing a solution with the application of mobile stand, where driver has to keep his cell phone on the mobile stand if he doesn't keep it properly on the stand then microcontroller starts working and gives signal to the driver to stop the vehicle and can start conversation on the cell phone. If the cell phone is kept properly in the mobile stand, then the driver will get a call on the system which will eventually causes less accidents. In other case if a road mishap takes place, this project will send emergency message to the rescue teams and surrounding people to save the life of victims.

Using RFID technology to develop an attendance system and avoid traffic congestion around kindergartens is designed by authors of [4]. In this work the author has developed an

application (based on active RFID and wireless GSM message) to find out the active student attendance system. The system is also used to relieve the traffic congestion especially while the parents are driving vehicles to pick up their children after class during the rush timings.

B) System structure

The block diagram of safe driving without using cell phone is shown in figure below. It consists of microcontroller, LCD, call indicator, GSM modem and driver unit etc. Microcontroller is used for controlling all the blocks. GSM modem is used for catching the different frequencies. LCD is used to display a caller's number. Driver unit is used to turn ON the circuit and also for battery charging. Buzzer and LED used for the call indicator.

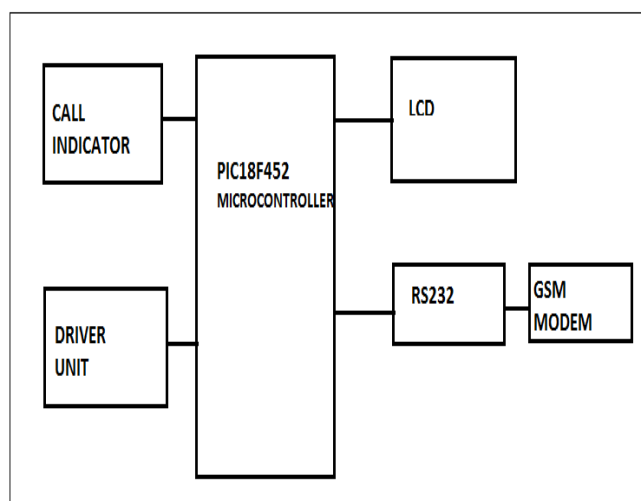


Fig.1 Block diagram

working

In our project the power supply of 12 V is taken from the vehicle. It can also be used for speakers and charging the cell phone. This power supply is given to the microcontroller. It helps to turn on the circuit. GSM module gives command to the microcontroller through serial communication, after that first command will be applied to disconnect the call. For the second and third condition we are using buzzer so we can alert the driver to hear voice message. For every call, GSM passes commands to the microcontroller for number identification and then the number is displayed on the LCD screen. Driver unit is used for giving power supply to the controller and at the same time it will recharge the rechargeable battery which will be used when the power supply is switched off. On the first call, the driver won't be able to attend the call and it will be disconnected automatically. When driver gets a call for the second time, the system will notify the driver via voice message. And the same procedure will be followed later on. But the driver won't be able to attend any calls unless and until the vehicle is stopped. As soon as the vehicle is stopped, microcontroller sends AT command to the system, and then driver will be able to attend the call. After stopping the vehicle, driver can receive the call.

III. TEST AND RESULT

Case 1: When the cell phone rings, the driver won't be able to attend the call. And the call will be automatically disconnected.

Case 2: When the cell phone rings for the second time then the driver will get an automatic voice message informing that the caller on other side might have an important reason to call and asks the driver to park his vehicle on the side. In this case also, user cannot attend the call and it will be disconnected automatically.

Case 3: When the cell phone rings for the third time, automatically voice message informs to the driver, but he cannot attend the call, until the vehicle which is in motion completely stops.

IV. APPLICATIONS

- 1) Military
- 2) Heavy transports of machinery

V. FUTURESCOPE

The system can be upgraded in such a way that due to incorporation of GPS system additional things can be achieved. Because of the GPS system we can locate the location and speed of the vehicle. The slowed down speed of the vehicle can be detected in the GPS system and as soon as speed comes to zero level we can attend the call.

VI. CONCLUSION

As we know with the increasing number of vehicles, everywhere in the world, the safety of the driver is the priority. In our project the system works in such a way that it does not allow driver to attend the call unless the vehicle is stopped. So the chances of the driver's distraction are less in any way. This helps to minimize the accidents and maximize the safety of the driver. Our system can be upgraded easily with some new modules because of the flexibility of an embedded system. Due to the simplicity of the module, it is affordable to the consumer.

ACKNOWLEDGEMENT

The authors wish to thank Acron Automation Engineers Pvt. Ltd. for the sponsorship to the project. Also thanks to Mr. Rakesh Jadhav for providing guidance and technical support over the proposed system.

REFERENCES

- [1] Nina Dragutinovic & Divera Twisk, "Use of mobile phones while driving – effects on Road safety" SWOV Institute for Road Safety Research - Leidschendam, 23 september 2014, Netherlands pp.1-55.
- [2] G.SRINIVASA RAO, B.PREMALATHA, "Safe Driving Using Mobile Phones", International Journal of Engineering Trends and Technology (IJETT) – Vol. 4, Issue 9, Sep. 2013, Hyderabad, AP-India, pp.4001-4004.
- [3] Prof. Abhay P. Bagade, "Cell Phone Usage While Driving Avoidance with GSM-RF Based Accident Emergency Alert System", International Journal of Advanced Research in Computer & Communication Engineering Vol. 2, Issue 5, May 2013, Nagpur, India, pp.2190-2196.
- [4] Whai-De Chen and Hsuan-Pu Chang, "Using RFID Technology to Develop an Attendance System and Avoid Traffic Congestion around Kindergartens", IEEE International Conference, July 31 2008-Aug 1 2008, Lanzhou, pp. 568-572.