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An Analysis and Precautionary measure for mobile   phone Accidents while driving and cost effective fatalities

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ABSTRACT

In environment, the ill-effects of using cell phones during driving is illustrated in this paper. Telecommunication industry is the world's fastest growing industry with more than 6 billion mobile subscribers (that's 87 percent of the world population) around the globe. This significant rise in use of cellular phone leads to increase in road accidents while driving. Every year nearly 1.4 million people have been killed mainly due to distractions and particularly because of using wireless customers and their over-bearing cell phones. While in India, an estimated 1.34 lakhs persons died due to road accidents in 2010 which is approximately 10% of road accident fatalities worldwide and these are the highest in the world, but still no research has been carried to trace out the number of drivers using cell phone involved in road accidents and very limited effort has been carried out to prevent accidents due to cell phone usage. With the aim of preventing such accidents, it is proposed to develop a highly efficient automatic system for early detection of incoming and outgoing call, by placing an antenna along with mobile detection unit above the driver seat. When there is an emergency call, a PIC16F917 microcontroller detects whether the vehicle is in motion or not based on RPM values captured using a photo interrupter sensor. If a vehicle in motion is detected, then the microcontroller will activate a voice chip which plays a warning message to the driver. If the driver stops the vehicle within 8 sec., then microcontroller allows the call or else a low range mobile jammer is used which covers only the driver seat will prevent the driver from receiving base stations signals.
Keywords: mobile phone, accident, driving.

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INTRODUCTION

Now a days, most of the accidents are occurring due to mobile phone driving and in activeness of driver. And due to our careless driving one vehicle is hitting to the other vehicle due to various reasons, especially drunk and driving. To avoid this we are implementing ultrasonic sensor, which will reduce the speed of our vehicle according to the range that we have given to the ultrasonic sensor. Our main aim is to implement the hand free design for mobile driving, by producing a dash board section in the car and mobile is to be placed in it, so that calls cannot be reached to that mobile and message will be going to the caller that user is in driving mode. It will be done automatically, without knowing to the driver, so that driver cannot pick the call. If again the call comes from the same number, then car will be reducing its speed. This way of driving mode reduces the number of accidents that are occurring these days.

A GSM modem can be an external modem device, such as the Wave come Modem. Insert a GSM SIM card into this modem, and connect it to a serial port on your computer. It can be a PC Card installed in a notebook computer, so as the Nokia Card Phone. It could also be a standard GSM mobile phone with the appropriate cable and software driver to connect it to a serial port on your computer device. Phones such as the Nokia 7110 with a DLR-3 cable, or various Sony Ericsson phones, are often used to this purpose. An encoder is a device, or circuit, or transducer, or software program, or an algorithm or person that converts, the information from one format or code to another, for the purposes of speed, secrecy, security or a compressions. A decoder is a device that does the reverse operation of an encoder, by undoing the encoding so that the original information will be retrieved. Using the same method to encode is usually just reversed in order to decode it. It is a combinational circuit that converts only binary information from n input lines to a maximum of 2^n unique output lines.

EXISISTING SYSTEM

No application is able to differentiate whether the cell phone user is either with the driver or passenger. There was a high chance that the driver can misuse this function. One more issue with these applications is, it fails to deal with an emergency call option. In addition to this, almost all the applications discussed rely on either GPS or Bluetooth which in turn may drain the phone battery soon. There is no ultrasonic sensor to the hand free design so that the vehicles don't strike each other. It works on the distance that mentioned in it.

PROPOSED SYSTEM

In this we Propose a concept for overcome this, it consists of two devices former the vehicle section once we start the ignition the RF signal when when the signal is received by the mobile immediately it changes to Driving mode. If mobile receives the call, it will be attending and gives the voice information, if the call is in emergency only means it will inform to the driver through ringing. If the driver takes the call, the speed of the car will be slowing down. By giving ultrasonic sensor to dashboard section of the vehicle we can control the speed. Encoder and Decoder are used to convert the codes to actual format and compress them to codes to reduce the size of the file.
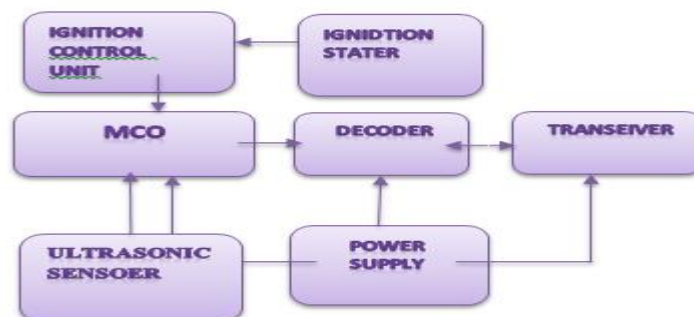

Fig i: Dash Board Section

The former section Consists of Ignition Starter and the microcontroller that gives the signal to the mobile. When the signal is received by the mobile it immediately changes in to Driving Mode. In Driving mode, if someone is calling it automatically attends the call and gives response only for the emergency call. Encoder and Decoder are used to convert the message into our convenient way. By giving ultrasonic sensor to dashboard section of the vehicle we can control the speed. Encoder and Decoder are used to convert the codes to actual format and compress them to codes to reduce the size of the file.

In the above diagram, ignition control unit is connected to the ignition starter in which both are connected to the microcontroller unit. Ultrasonic sensor works on the basis of microcontroller unit. The messages to the MCU are received from the encoder which converts the code into normal message. Both the transceiver that are connected to dashboard and mobile section are placed near to each other. Then they transmit the signal to each other with the help of encoder and decoder. The power supply circuit is placed between ultrasonic sensor and transceiver that passes the supply to whole section. PIC16F877A microcontroller is used for this process.
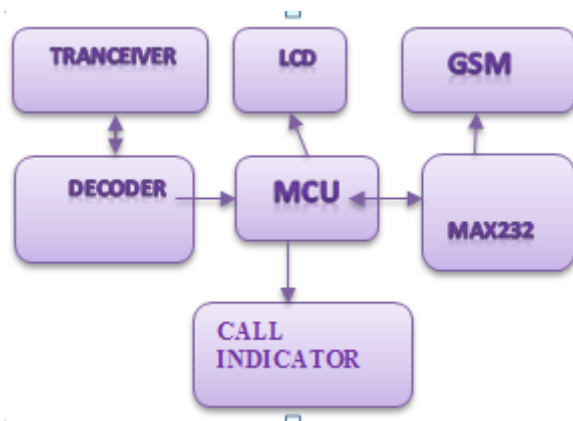

Fig ii.

Mobile section consists of transceiver, LCD, GSM modem, decoder, and microcontroller unit and call indicator. Decoder converts the message which consists of huge memory to different codes to compress it. Later it can be encoded by encoder to normal message. Microcontroller unit is placed in Microcontriller unitbetween the centre of mobile microcontroller unit is placed in between the centre section and is to be worked. The decoder is connected to the transceiver which is connected to the dash board section. Then call indicator is connected to the microcontroller unit that works on the GSM modem.
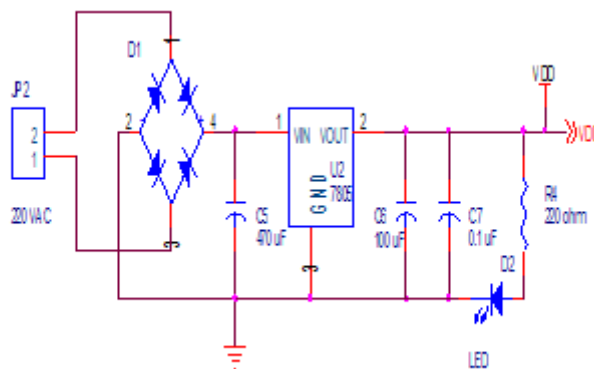

Fig iii: Power Supply Circuit

The operation of power supply circuits are built using filters and rectifiers then voltage regulators that are used in it. By Starting with an AC voltage, then a steady DC voltage is obtained by rectifying the AC voltage, that then filtering to a DC level, and finally, regulating to obtain to a desired fixed DC voltage similar to it. The regulation is usually obtained from an IC voltage regulator Unit, that takes a DC voltage and provides a

somewhat lower DC voltage, that remains the same even if that the input DC voltage varies, or the output Load connected to the DC voltage that occur the changes.

APPLICATIONS

- Public transportation systems
- Real time applications
- Automotive applications

REFERENCES

[1]   AAA Foundation for Traffic Safety "Cell Phones and Driving:Research Update", Washington, 2008.
[2]   Abiodun, O., George, L. and Abayomi, O. "Mobile phone use by drivers in Trinidad and Tobago,West Indies", Journal of Public Health and Epidemiology, Vol. 3, No. 3, pp. 115-120, 2011.
[3]   Beede, K.E. and Kass, S.J. "Engrossed in conversation: The impact of cell phones on simulated driving performance", Accident Analysis and Prevention, Vol. 38, No. 2, pp. 415-421, 2006.
[4]   Bouchner, P. "A complex analysis of the driver behavior from simulated driving focused on fatigue detection classification WSEAS Transactions on Systems, Vol. 5, No. 1, pp. 84-91, 2006.
[5]   Box, S. "New Data from VTTI Provides Insight into Cell Phone Use and Driving Distraction", Virginia Tech Transportation Institute, USA, 2009.
[6]   Caird, J.K., Willness, C.M., Steel, P. and Scialfa, C. "A meta-analysis of the effects of cell phones on driver performance", Accident Analysis and Prevention, Vol. 40, No. 4, pp. 1282-1293, 2008.
[7]   Cameron, D. and Keith, P. "Analysis of Computer Vision To Detect And Correct Driver Inattentiveness", Eleventh Annual Freshman Conference, University of Pittsburgh, USA, 2011.
[8]   Cohen, J.T. and Graham, J.D. "A revised economic analysis of restrictions on the use of cell phones while driving", Risk Analysis, Vol. 23, No. 1, pp. 5-17, 2003.
[9]   Donmez, B., Boyle, L.N. and Lee, J.D. "The impact of driver distraction mitigation strategies on driving performance", Human Factors, Vol. 48, No. 4, pp. 785-804, 2006.
[10]   Garder, P. "Segment characteristics and severity of head-on crashes on two-lane rural highways in Maine", Accident Analysis and Prevention Vol. 38, No. 4, pp. 652-661, 2006.
[11]   Garg, V.K. "Principles and applications of GSM", Prentice Hall PTR, 1999.
[12]   Hahn, R.W. and Prieger, J.E. "The impact of driver cell phone use on accidents", The B.E. Journal of Economic Analysis and Policy, Vol. 6, No. 1, pp. 1-37, 2006.
[13]   Itoh, K., Miki, Y., Yoshitsugu, N., Kubo, N. and Mashimo, S. "Evaluation of a Voice- Activated System Using a Driving Simulator", SAE Technical Paper 2004- 01-0232, 2004.