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ANTI-MOBILE CAR USING ARDUINO

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Abstract: Cars have become a part of almost everyone's life taking people from one place to another. In such a fast paced mode of transport, there are a variety of ways in which drivers can get distracted while driving. Getting stuck in a traffic jam, doing other tasks simultaneously while driving- for example drinking, talking over the mobile phone are various forms of distractions. The data from these expressive parts of the driver yield a high accuracy of distraction detection of over 90%. With such high accuracies, reliable systems could be built to have early warning or corrective mechanisms which would avoid or reduce the intensity of accidents caused due to driver distractions. This paper presents a new approach towards automobile safety and security. It deals to design a system that can curb the chances of accidents on road. We propose three distinct but closely related concepts via mobile detector, alcohol detector and school protocol. A mobile detector which detects a call within the specified range of the driver's seat. On this detection, the speed of car is slowed down using a control device Arduino and same goes for alcohol system .If the vehicle is in non honking zone or near the school, the speed of the car is lowered.

Keywords: Distracted driving; Mobile detector; Alcohol detector; Arduino.

1. INTRODUCTION

Driver distraction is an important risk factor for road traffic injuries. Voice interactive systems, navigation systems, hands-free mobile communications, and music players are a few examples. These new gadgets no doubt give the driver the ability of multi tasking but divert the driver's attention from his primary task of driving. These diversions are collectively termed as distractions. Distraction means anything that diverts the attention of driver from the task of controlling the vehicle and responding to critical situations. Causes of distraction can be broadly classified into visual, cognitive, biomechanical and auditory. Our paper aims at raising a awareness about the risk of distracted driving with the use of mobile phones and to present countermeasures to prevent them. Over the past 15 years, the use of mobile phones in motor vehicles has increased at a remarkable rate. Yet it is irrefutable that utilizing a cell phone while driving can result in severe effect as it relates to the overall safe operation of a vehicle. Number of things is considered for deciding whether the trade off in convenience worth's the potential risks associated with the distraction created by cell phone. A similar limitation of human when it comes to processing too much information, but unlike computers, our resources are somewhat fixed.

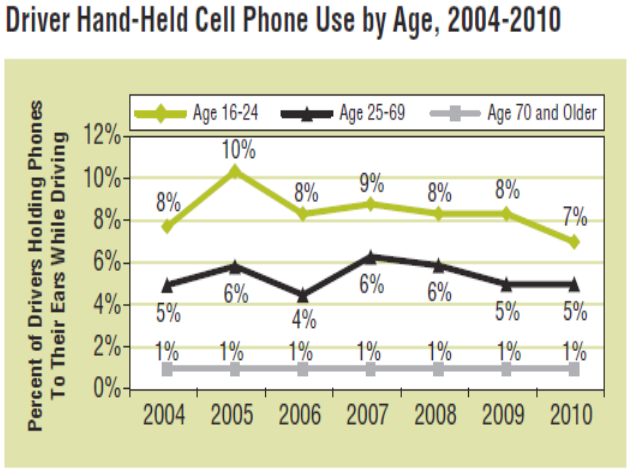

Fig.1

Given the inherent delays in our own thought response time when faced with increased load factors, is it practical or safe to hold a cell phone conversation while driving a motor vehicle? 80% of car accidents in the US are due to inattentive drivers who spend more time talking on the cell phones while driving. This is a real statistic according to the US National Highway Traffic Safety Administration. A combination of talking on mobile phones and driving can be quite troublesome, as it invites not only driving accidents, but also penalties and punishments. The latest research conducted at the University of Utah also suggests that talking on cell phones, whether hands-free or handheld, while driving leads to impairment similar to that of a drunk driver. Several Indian states have also modified their driving laws that make talking on phones while driving a punishable offense. For instance, the Delhi Police charges offenders a fine of Rs.1000. The Indian government is now considering it breaking the driving law (Motor Vehicles Act) to impose a fine of Rs. 2000 or six months imprisonment on those caught talking-and-driving. For those resulting in road accidents, the punishment could be suspension of driving license for six months. Well, the government is certainly bang on the decision. Statistics reveal that a large portion of driving accidents in India is caused by mobile phone usage while driving. The reason

is that while we talk on phones, our brains concentrate on processing the phone conversation and ignores any other inputs. That is, when you talk on the phone while driving, although you may see a pedestrian walking dangerous close, your brain takes a tad longer to process that information, thus increasing your reaction time and wasting crucial seconds while on the move. Here is a glimpse into some countries that have banned cell phone usage and driving: Australia, Bahrain, China, France, Egypt, Germany, Greece, Hong Kong, Italy and UK, among others. Several states in the US, Pakistan, India and Mexico and several Canadian provinces have also banned the use of cell phones while driving.

RESEARCH

While there are a number of valuable studies on this subject, the following are extensive research projects provided by highly accredited organizations:

1. Virginia Tech Transportation Institute researchers and the National Highway Traffic Safety Administration NHTSA) tracked 100 cars and their drivers for a year; they discovered that talking on cell phones caused more accidents, than other incidents and distractions (100-Car Naturalistic Driving Study, April 2006).
2. University of Utah researchers determined that motorists on the blood-alcohol threshold of being legally drunk were able to drive better than sober cell phone using drivers. Psychology Professor David Strayer a key researcher and author in this field says that, "Just like you put yourself and other people at risk when you drive drunk , you put yourself and others at risk when you use a cell phone and drive. The level of impairment is very similar."
3. The George Institute for International Health (University of Sydney, Australia), Insurance Institute for Highway Safety (Arlington, Virginia) and Injury Research Centre, University of Western Australia (Crawley Australia) jointly presented research entitled "Role of mobile phones in motor vehicle crashes resulting in hospital attendance: a case-crossover study". The research consisted of

456 drivers aged 17 years who owned or used mobile phones and had been involved in road crashes requiring hospital attendance between April 2002 and July 2004. It was concluded that a driver who uses a mobile phone (up to 10 minutes prior to a crash) has a four times higher chance of crashing and an increased possibility of a crash resulting in injury. Using a hands-free phone is not any safer.

4. The National Highway Traffic Safety Administration (NHTSA) estimates 20% to 30% of the crashes are caused by driver distraction. The National Highway Traffic Safety Administration estimates that 73% of subscribers use their phone while driving.
5. Statistics from the 2002 National Conference of State Legislatures show that each year: There are 6 million crashes on the nation's roads. More than 42,000 people are killed. More than 3 million are injured.

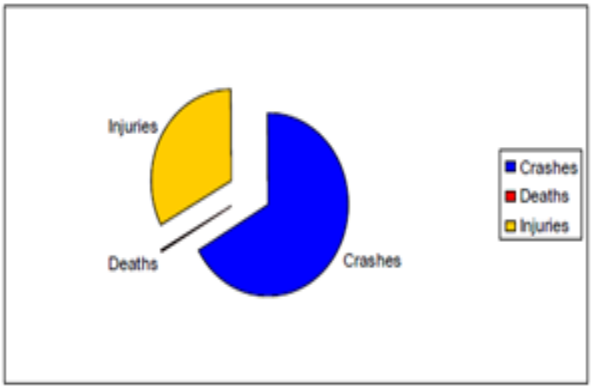

Fig 2

6. Data from the Harvard Center for Risk Analysis suggests that Drivers talking on their phones are responsible for about 6% of U.S. accidents each year. Cell phone use while driving increases the accident risk by almost 400%.

DANGERS OF CELL PHONE-RELATED VERSUS ALCOHOL-RELATED ACCIDENT STATES

While the Illinois General Assembly seems focused on banning cell phone use while driving, maybe they should also be concerned about dangerous alcohol-related driving? So maybe there should be a trailer bill introduce banning the use of alcohol before driving?.**United States Cell Phone Car Accident statistics per** Illinois House Joint Resolution 0008 **–**Cell phone distraction causes 2,600 death.330, 000 injuries in the United States every year. **United States** Drunk Driving Car Accident Statistics (2009).Three in every ten Americans will be involved in an alcohol-related crash at some point in their lives. Out of total accidents in 2009, 32 percent involved alcohol- inebriated drivers. On average, one person died every 48 minutes in 2009 due to an alcohol- impaired driver. In 2009, all 50 states, the District of Columbia, and Puerto Rico made it illegal to drive with a BAC of .08 or higher. Of the 10,839 people who died in an alcohol-related accident, 7,281 (67 percent) had drivers with BACs above the legal limit. For fatal crashes occurring from midnight to 3 a.m., 66 percent involved alcohol- impaired driving. On New Year's Day, 468 people were killed in car accidents. Alcohol-impaired driving contributed to 40 percent of them. Inevitable crashes involving alcohol-impaired drivers occurred four times more at night than during the day (37 percent versus 9 percent).

CASE STUDY:

Pennsylvania Cell Phone Car Crash States, in Pennsylvania, although there are no laws regarding talking on the cell phones or sending text messages while driving, there are emerging statistics that show the connection between cell phone use and car destructions. There were 23,059 crashes involving 16- to 19- yearold in 2008, resulting in 194 deaths. Driver distraction contributed to about 10% of them, but the number could be much higher. In Pennsylvania, there were 1,298 cell phone related accidents in 2008. Of those accidents, 9

resulted in death. From 2003 to 2006, car accidents from cell phone use lead to 50 deaths across the state of Pennsylvania. Cell phone-related car accidents worn out upto 43 percent in western Pennsylvania from 2003 to 2006.PennDOT also reports 367 accidents in the same time period involving hands free cell phones or Bluetooth communication devices.

Advertisement:

Handheld Cell Phone Use: 10 states, D.C., Puerto Rico, Guam and the U.S. Virgin Islands prohibit **all drivers** from using handheld cell phones while driving. Except for Maryland and West Virginia (until July 2013), all laws are primary enforcement—an officer may cite a driver for using a handheld cell phone without any other traffic offense taking place. All Cell Phone Use: No state bans all cell phone use for all drivers, but many prohibit use by certain subsets. Text Messaging: 39 states, D.C., Puerto Rico, Guam and the U.S. Virgin Islands ban text messaging for all drivers. All but 4 have primary enforcement. Crash Data Collection: Many states include a category for cell phone/electronic equipment distraction on police accident report forms. Proposed federal legislation would require states to collect this data in accordance with Model Minimum Uniform Crash Criteria guidelines to qualify for certain federal funding. Preemption Laws: Many localities have passed their own distracted driving bans. However, some states – such as Florida, Kentucky, Louisiana, Mississippi, Nevada, Pennsylvania, and Oklahoma

– prohibit localities from enacting such laws. NOTE: GHSA does not compile any additional data on distracted driving laws other than what is presented here. For more information, consult the appropriate State Highway Safety Office. banning the use of handheld cell phones. However, all of the states counties have enacted distracted driving ordinances. Idaho has a "Distraction in/on Vehicle (List)" attribute as part of its Contributing Circumstances element, and officers are supposed to list the distractions in the narrative. Illinois bans the use of handheld cell phones while driving in a school zone or in a highway construction zone. Dealt with as a distracted driving issue; New Hampshire enacted a comprehensive distracted driving law. Texas has banned the use of hand-held phones and texting in school zones. Tamil Nadu:Madurai disaster and accident road safety police law enforcement If drivers do not stop, challan will be sent to their home after capturing registration number through camera Next time when you talk over mobile phone and drive your vehicle, be sure you have Rs. 1,000 in your pocket to pay as fine, if caught by the police.

NEW DELHI: Get real and don't legislate something that can't be enforced. This is what the country's top traffic policemen have suggested to legislators who are bringing in a law that bans the use of a range of devices under the ambit of 'mobile phone' while driving. The Motor Vehicle Amendment Bill proposes to impose fines on drivers caught using any hand held or hands free device, or any gadget capable of transmitting or receiving signs, images or sounds. All such gadgets, which would include GPS navigation devices and iPods, have been lumped under the definition of 'mobile phone' in the draft law pending in the Lok Sabha. "Many traffic legislations in our country cannot be implemented and there is huge confusion. A simply written and well defined law helps a lot in implementation," Rohit Baluja, a road safety expert and president of Institute of Road Traffic Education (IRTE), said.

Fig 3

SYSTEM CONSIDERATION

The antimobile car system consist of a mobile detector which detects a call within the specified range of the driver's seat. On this detection, the speed of car is slowed down using a control device Arduino. If the vehicle is in non honking zone or near the school, the speed of the car is lowered. Acceleration pad is connected with interface card through helical motor. Interface card is controlled through Arduino board via USB. Mobile frequency detector is used to detect incoming call. Receiver to receive the signals from the transmitter which is located near school and nonhonking zone.

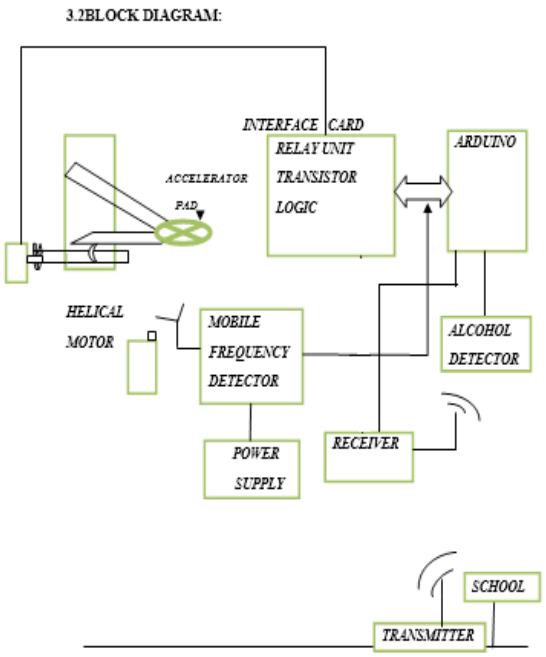

Fig 4

MOBILE FRQUENCY DETECTOR

Sniffer the handy mobile bug or cell phone detector, pocket- size mobile transmission detector can sense the presence of an active mobile cell phone from a distance of one and-a-half meters, so it can be also used to prevent use of mobile phones in examination halls, confidential rooms, etc. It can be also used for detecting the use of mobile phone for spy and unauthorized video transmission. It is possible to detect both the incoming and outgoing calls, SMS and video transmission using this circuit even if the mobile phone is kept in the silent mode. The moment the bug detects RF transmission signal from an active mobile phone, a beep sound is produced for alarm indication and the LED blinking for visual indication. The alarm continues until the signal transmission ceases. An ordinary RF detector using tuned LC circuits is not suitable for detecting signals in the GHz frequency band used in mobile phones. The range of transmission frequency for mobile phones is 0.9 to 3 GHz with a wavelength of 3.3 to 10 cm. So a circuit detecting gigahertz signals is required for a mobile bug. Here the circuit uses capacitor to capture the RF signals from the mobile phone. The length of leads of capacitor is fixed to 18 mm with a spacing of 8 mm between the leads to get the desired frequency. LM555 is a highly stable device for generating accurate time delays or oscillation. Additional terminals are provided for triggering or resetting if desired. The time is precisely controlled by one external resistor and capacitor in the time delay mode of operation. For astable operation as an oscillator, the free running frequency and duty cycle are accurately controlled with two external resistors and one capacitor. The circuit is triggered and reset on falling edge of waveform, to drive the output circuit for TTL logic or source or sink up to 200mA . ALCOHOL SENSOR: It aims at designing and executing the vehicle controlling using RF. By using RF communication, whenever alcohol detector detects the presence of alcohol, the micro controller sends the information to the encoder and the value is encoded by the encoder and is transmitted by the RF Transmitter. RF Receiver receives the information from the RF Transmitter and decoder decodes the serial input and sends to the Arduino.

ARDUINO PROGRAMMING:

Arduino is one of the open source embedded development platform which consists of a simple development board and an easy to use development environment for writing, programming and uploading codes. Probots Freeduino USB is an Arduino compatible board. It is designed to be a cost effective alternative to the official Arduino Board and is compatible with Arduino compatible shields, tools and the Arduino IDE. It can be used anywhere where an official Arduino can be. Arduino is an open source development platform, which means all the designs files are available for free. Users may use these freely available design files, which include the board schematics, PCB Files, codes, etc in their projects making suitable modifications as their application may require. A large Arduino user base ensures that you will get an excellent technical assistance, which will reduce your development time and increase your experience of learning . Another great feature of the Arduino is its modularity approach. There is a wide range of add on boards, called Shields, which plug onto an Arduino and help you to achieve a specific purpose, that greatly simplifies the whole development process.Following figure shows the flow charts of whole system.

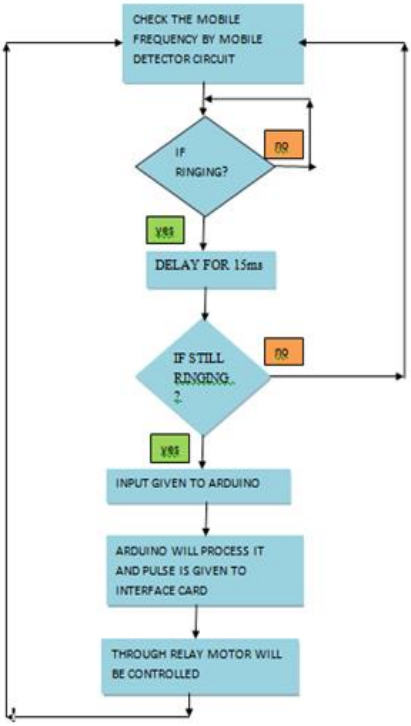

Fig 5

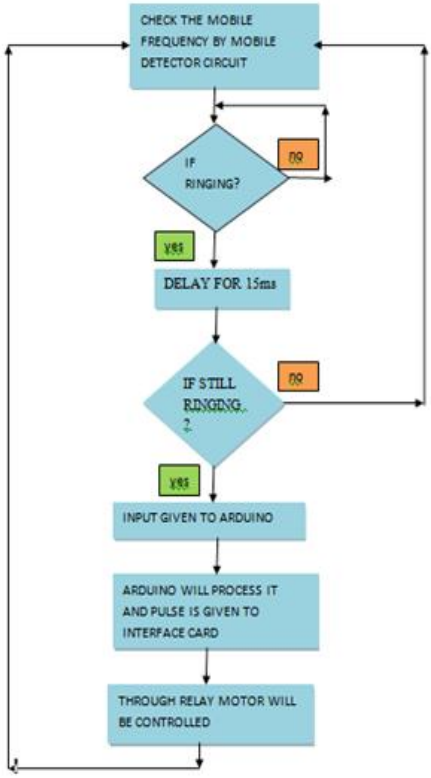

Fig 6

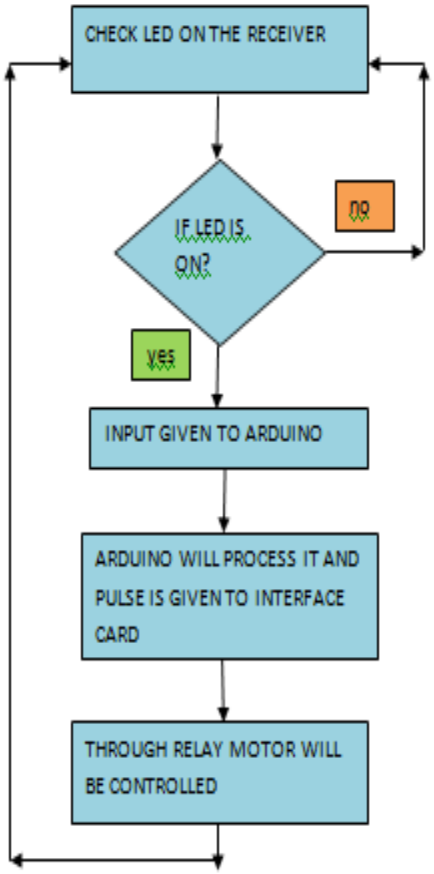

Fig 7

Fig 8

TESTING AND RESULT:

civil defense, for mobile radiation detection. Used for spying the unauthorized video transmission in mobile phones, examination, seminar halls, hospitals. Mobile detector gives the range depending on components in the circuit. Hence it is variable according to application. Mobile detector circuit detects call as well as sms. Alcohol detector will detect presence of alcohol with in specified range. School receiver detects the school near by. Arduino controls the motor according to input given to it from above three circuits.

Compared Result:

Sr. No.	Normal Speed	Lowered Speed
1.	100rpm	65rpm
2.	110rpm	67rpm
3.	120rpm	70rpm

CONCLUSION

This project aimed at implementing a system which is based on Arduino in order to avoid accident risk. We have a learnt a new technology, which is user friendly and handy. Many features can be added using various technologies.

APPLICATION

Area where there is speed limit. It can be implemented in Non-honking region, for military

REFERENCES

1) Driver State Monitor from DELPHI Proposal for Demonstration at IEEE CVPR 2005, San Diego,
2) CA N. Edenborough, R. Hammoud, A. Harbach, A. Ingold, B. Kisaˇcanin, P. Malawey, T. Newman, G. Scharenbroch, S. Skiver, M. Smith, A.Wilhelm, G.Witt*, E.Yoder, and H. Zhang
3) IEEE TRANSACTIONS ON INTELLIGENT TRANSPORTATION SYSTEMS, VOL. 8, NO. 2, JUNE 2007 Real-Time Detection of Driver Cognitive Distraction Using Support Vector Machines Yulan Liang, Michelle L. Reyes, and John D. LeeA REVIEW OF AUTOMOTIVE HUMAN MACHINE INTERFACE TECHNOLOGIES AND TECHNIQUES TO REDUCE DRIVER DISTRACTION Carl A. Pickering*, Keith J. Bumnhamt, Michael J. Richardson* *Jaguar and Land Rover Technical Research, UK, Jaguar Cars, Engineering Centre, Whitley, Coventry. ‘Coventry University, UK, Control Theory and Applications Centre, Priory Street, Coventry.
4) Proceedings of the 2008 IEEE International Conference on Vehicular Electronics and Safety Columbus, OH, USA. September 22-24, 2008 Body Sensor Networks for Driver Distraction Identification
5) Amardeep Sathyanarayana, Sandhya Nageswaren, Hassan Ghasemzadeh, Member, IEEE, Roozbeh Jafari, Member, IEEE, John H.L. Hansen, Fellow, IEEE.
6) A Drowsy Driver Detection and Security System Rajat Garg, Vikrant Gupta, Vineet Agrawal

Department of Electronics and Communication VIT- University, Vellore- 600014, India

7) Mobile Phone Based Drunk Driving Detection Jiangpeng Dai * t , Jin Teng t, Xiaole Bai t, Zhaohui Shen:j: and Dong Xuan.
8) The automatic control system of anti drunk-driving Wang dong1 Cheng quan cheng1 1 College of Engineering, Bohai University Jinzhou 121000, China.