

MOBILE PHONE – DISTRACTED DRIVING

SAFETY IMPLICATED COMMUNICATION SYSTEM

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ABSTRACT

The impact of mobile phone communication during driving is very serious to both property and life. In today's world the number of road accidents is due to distracted attention during driving, mainly because of the usage of mobile phone. With the aim of preventing road accidents occurrence due to speaking over phone while driving, a highly efficient automatic electronic system (Intelligent Transport system) for answering and averting the call is proposed. Any incoming call to the driver's mobile is forwarded to the GSM module that uses another SIM. The call is automatically answered after three rings and gets averted after twenty seconds with the help of coded arduino microcontroller.

The driver can respond by speaking after hearing the caller's voice through the microphone and speaker inbuilt in the system. The system is designed in a simple way such that there is no distraction of taking mobile phone in hand and no issues of missing important call.

1. INTRODUCTION

A road traffic accident (RTA) is any injury due to crashes originating from, terminating with or involving a vehicle partially or fully on a public road. It is projected that road traffic injuries will move up to the third position by the year 2020 among leading causes of the global disease burden. They are considerable economic losses to victims, their families, and to countries as a whole.

Rather than mechanical, its human factor that contribute significantly to increasing number of road accidents in India.

Drunken driving, over speeding, refusal to follow traffic rules, and reckless driving are main reasons for road accidents.

Reckless driving like use of mobile phones during driving, non-use of helmets, non-use of seat-belts are significant contributing factors for road traffic accidents and should be avoided. Driver fatigue and sleepiness also contribute to crashes. Only 28 countries have comprehensive road safety laws on major key risk factors like drunken driving, distracted driving, speeding, and failing to use helmets, seat-belts, and child restraints. This is a major cause of concern and both society and government should work together to reduce this preventable cause of death.

India is no exception and data showed that more than 1.3 lakh people died on Indian roads, giving India the dubious honour of topping the global list of fatalities from road crashes. Rapid urbanization, motorization, lack of appropriate road engineering, poor awareness levels, nonexistent injury prevention programmes, and poor enforcement of traffic laws has exacerbated the situation.

1.1 DISTRACTED DRIVING

Distracted driving is any activity that could divert a person's attention away from the primary task of driving. All

distractions endanger driver, passenger, and bystander safety.

There are many types of distractions that can lead to impaired driving, but recently there has been a marked increase around the world in the use of mobile phones by drivers that is becoming a growing concern for road safety. The distraction caused by mobile phones can impair driving performance. Drivers using mobile phones may have: slower reaction times (notably braking reaction time, but also reaction to traffic signals), impaired ability to keep in the correct lane, and shorter following distances.



Rebecka Rios
La Vernia High School
La Vernia, Texas
Second Place
2013 Sixth Annual Driving the Message Contest,
sponsored by State Farm

CONSEQUENCES

- Text messaging also results in considerably reduced driving performance, with young drivers at particular risk of the effects of distraction resulting from this use.
- Research has shown that the reaction time of drivers increases by 0.5 to 1.5 seconds when they are talking on handheld phones, and drivers have difficulty maintaining the correct positions in their lanes, maintaining appropriate speeds and judging and accepting safe gaps in traffic.
- Drivers using a mobile phone are approximately 4 times more likely to be involved in a crash than when a driver does not use a phone. Hands-free phones are not much safer than hand-held phone sets.
- While there is little concrete evidence on how to reduce mobile phone use while driving, governments need to be proactive. Actions that can be taken include: adopting legislative measures, launching public awareness campaigns, and regularly collecting data on distracted driving to better understand the nature of this problem.



1.2 STATISTICS

Drivers in their 20s are 23 percent of drivers in all fatal crashes, but are 27 percent of the distracted drivers and 38 percent of the distracted drivers who were using cell phones in fatal crashes. (NHTSA). Over 1,37,000 people were killed in road accidents in 2013 alone, that is more than the number of people killed in all our wars put together (NDTV – DECEMBER 2016). About 1.25 million people die each year as a result of road traffic crashes. Road traffic injuries are the leading cause of death among young people, aged 15–29 years. 90% of the world's fatalities on the roads occur in low- and middle-income countries, even though these countries have approximately

half of the world's vehicles. Half of those dying on the world's roads are "vulnerable road users": pedestrians, cyclists and motorcyclists. Without action, road traffic crashes are predicted to rise to become the 7th leading cause of death by 2030. The newly adopted 2030 Agenda for Sustainable Development's has set an ambitious road safety target of halving the global number of deaths and injuries from road traffic crashes by 2020.

(**Source of Information:** National Crime Records Bureau, Ministry of Road Transport & Highway, Law commission of India, Global status report on road safety 2013). Recently, the National Safety Council (NSC) released data showing that 27 percent of car crashes—or 1,535,490 in 2013—were caused by cell phone use.)

2. LITERATURE SURVEY

Researchers and scientists proposed various ways like developing a model or devices or an application to prevent the usage of mobile phone during driving. But still each has its own demerits.

One of the proposed solutions is to use technology to fight distracted driving. Some of the gadgets that have already been introduced to the market or are in the planning stages include:

(1) **Anti Sleep Devices:** these devices require you to answer questions in order to ascertain a safe period of uninterrupted driving time;

(2) **Alert Systems:** these systems send audible alerts when you are changing lanes without a signal, crossing into other lanes, or driving too close to the edge of the road;

(3) **Collision Warning Systems:** these gadgets gauge how far you are from other vehicles, particularly the vehicle in front of you, and advise you to slow down and create a greater space to avoid a collision; and

(4) **Apps that Prevent Cell Phone Use in a Moving Vehicle:** these apps would prevent cell phones from functioning inside moving vehicles.

Companies have developed and invested in new technologies to prevent a driver from using a cell phone when the driver is behind the wheel and each came up with different innovative solutions. Some of them are listed below.

Illume Software's *iZUP* solution uses GPS to detect if you're driving on a highway. It runs in the background and comes to life when it detects you are moving faster than a preset velocity, typically 5 mph. Once it detects that the phone is moving more than the preset value, it interrupts the normal

operation of the phone with the iZUP application. Subscribers cannot text or make phone calls while the car is moving.

DriveAssist by Aegis Mobility is a network-centric solution. It uses a phone's GPS to detect when the car is moving and it redirects all phone communications to a message center which explains that the caller is unavailable because they are driving. It also defers text messages [1].

ZoomSafer and iSpeech's *Drive Safely* focus on using text-to-speech technology to read text messages to you while you're

Key2SafeDriving and obd Edge's cell control use a hardware dongle in the car that communicates with the user's cell phone via Bluetooth. When the phone gets within range of the dongle in the car, key2SafeDriving turns off the use of the phone and texting [2].

Cell Control application installed on a cell phone will prevent incoming and outgoing calls while a car is in motion.

PhoneEnforcer application which automatically turns off the cell phone when the user is driving. This patent pending process enhances driving safety by stopping mobile phone use [3].

3. DISADVANTAGES OF EXISTING METHODOLOGIES

- Health hazard – electro magnetic waves

The radiation emitted from mobile jammer contains electromagnetic waves which causes brain cancer.

- Large range – so disturbance to co passengers

Even a small range jammer used interferes with the copassengers network completely blocking the network.

- Total network cut off – missing important calls

Some apps completely block the network. Therefore all the calls are blocked. Important calls and emergency calls are also missed.

4. PROPOSED METHODOLOGY

- A highly efficient automatic electronic system (Intelligent Transport system) for answering and averting the call
- Incoming call to the driver's mobile is forwarded to the GSM module that uses another SIM
- Call is automatically answered after three rings and gets averted

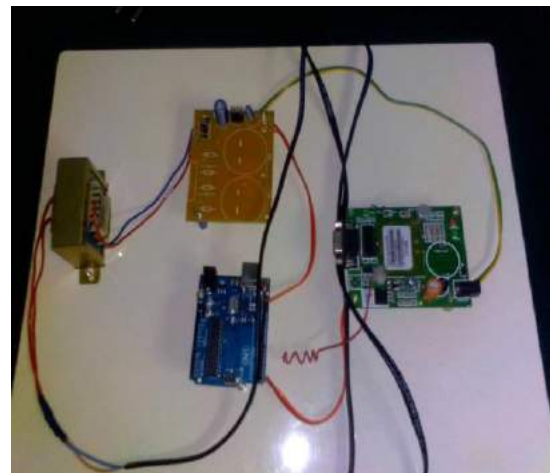
after twenty seconds with the help of coded arduino microcontroller

- Driver can respond by speaking after hearing the caller's voice through the microphone and speaker inbuilt in the system

5.WORKING PROCEDURE

Activate conditional call forwarding mode in driver's mobile. When there is incoming call to driver, Sim inserted in GSM modem (integrated via transmitter and receiver pin of arduino uno sequence) is activated. The arduino uno board is integrated with AT Mega328 microcontroller. so it has a optiboot loader. the programming language used to code the microcontroller is simple c++. so the microcontroller is already programmed to send command to the gsm module after three rings to attend it. The call is received by GSM modem after three ring automatically using the AT Commands. At the Call receiving instant the timer can be active. The microphone and speaker gets activated. Dialler's voice can be heard and driver can respond in the 20 seconds time limit. Whenever timer of delay reach 20 sec the call end AT command passes from microcontroller to GSM module and the call is ended.

6.MODEL SET UP



7.ADVANTAGES

- No health hazard
- low cost, non invasive , small size system
- No distraction of taking mobile phone in hand
- No issues of missing important call

CONCLUSION

This project presents a low cost, non invasive , small size system which helps the driver to respond to the call automatically so that important call is not missed. It also helps in preventing the road accident due to distraction to a large extent. Though Engineers, researchers or scientist innovate various new technologies to prevent road accident, but still road accident continues. To overcome this type of situation all people must educate, realize and give more attention along with newly innovated technology to decrease the rate of road accident.

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