Chapter 14

A Novel Approach to Avoid Mobile Phone Accidents While Driving and Cost–Effective Fatalities

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ABSTRACT

This paper presents the results of mobile application which helps in preventing mobile phone accidents to the great extent. An electronic circuit (Transmitter and Receiver block) also designed to detect the driver’s mobile phone automatically once he or she starts the vehicle and the circuit will switch OFF and then ON the mobile phone without human intervention with the help of 5 pin relay in order to start the application automatically. The authors further extend the research by comparing the obtained results after installing this application with a recent study of the US National Safety Council, conducted on 2010. The authors also show how far this application helps in reducing economic losses in India.

INTRODUCTION

Mobile phones are essential means of communication when we are away from the office or home and it can be an important security asset in the event of an emergency. However, many studies have shown that driver use of mobile phones increases driving risk (Walsh, White, Hyde, & Watson, 2008; Charlton, 2009; Strayer & Drews, 2007). This risk also extends to pedestrians (Loeb & Clarke, 2009; Nasar, Hecht, & Wener, 2008). For example, it is estimated that mobile-phone use for one hour a month increases accident risk by 400–900%. Other studies show that a high percentage of accidents among youngsters are due to mobile phone use (Neyensa & Boyle, 2007). The increased accident risk is due to the fact that drivers using the phone are distracted from their main task, resulting in slower reaction time which leads to accidents.

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Distraction

Using a cell phone while driving, whether to talk or to text, is a major distraction that causes car accidents. Dialing and holding a phone while steering can be an immediate physical hazard, but the actual conversations always distract a driver attention. Distraction is broadly classified into two categories 1) Physical distraction (Visual and Mechanical), and 2) Cognitive distraction.

Physical Distraction

When using a hand-held mobile phone, drivers must take away one hand from the steering wheel to hold and operate the phone (Mechanical Distraction). They must also take their eyes off the road, at least momentarily, to pick up and put down the phone and to dial numbers (Visual Distraction). While using a hand-held phone, the driver always continues to simultaneously operate the vehicle (steer, change gear, use indicators, etc.) with only one hand. Although the physical distraction is far greater with hand-held phones, there is still some physical activity with hands-free systems. Even though they do not need to be held during the call, the driver must still divert their eyes from the road to locate the phone and (usually) press at least one button (Royal Society for the Prevention of Accidents, 2001).

Cognitive Distraction

When mental (cognitive) tasks are performed concurrently, the performance of both tasks is often worse than if they were performed separately, because attention has to be divided, or switched, between the tasks and the tasks must compete for the same cognitive processes. When a driver is using a hand-held or hands-free mobile phone while driving, he or she must devote part of their attention to operate the phone and maintain the telephone conversation, part to operating the vehicle and responding to the constantly changing road and traffic conditions. The demands of the phone conversation must compete with the demands of driving the vehicle safely.

Indian Statistics

Due to this type of distractions, in 2009 nearly one hundred and thirty five thousand people died in Indian road accidents according to National Crime Records Bureau. In India alone, the death toll rose to 14 per hour in 2009 as opposed to 13 in previous year. By 2030, road accidents are projected to become the fifth biggest killer as per Global Status Report on Road Safety (Figure 1).

Many studies highlight the usage of mobile phone and drunk & drive is the major cause for road accidents. In order to observe which is more dangerous either a mobile phone usage or presence of alcohol during driving. We extend our research by collecting special studies and data from various article and research organization. According to their research report by considering parameters like number of accidents, Brake on time, Brake force etc., Almost 90% of the studies proves usage of mobile phone while driving exhibited greater impairment than intoxicated drivers while remain-

Figure 1. Accident deaths year wise in India
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