Journal of Engineering and Applied Sciences 13 (21): 9184-9188, 2018
ISSN: 1816-949X

A Study on the Accident Warning Sound System of the Smombie Driver

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Abstract: In recent years, Smombie (Smartphone+Zombie) is a new word that refers to people who walk around walking on a smartphone while watching a smartphone. They are walking around while concentrating on smartphones, so, they do not look around and often cause accidents. However, there is not only an addict who is walking on the stomach but there are many unexpected drivers who use smart phones while driving. In order to prevent such accidents, we have conducted a study to forcibly install a system that generates a beep in response to external hazards as well as limited use in the driver's seat of a car as well as the smartphone itself. As a research method when a person holding a smartphone is seated in the driver's seat, the smartphone is automatically set to the driver's mode and the smartphone senses the driving of the vehicle, so that, only speakerphone or earphone phone call or navigation or audible sound is operated. The smartphone detected to be operated in the driver's seat temporarily stops the function, so that, other functions such as search or game cannot be used. Nevertheless, if the driver is using a smartphone, a strong beep will sound. You can also receive danger warnings in conjunction with external crosswalks or caution signs. This system is operated by automobile and smart phone.

Key words: Smombie driver, smartphone, addict, criminal act, accident prevention, warning sound, automobile

INTRODUCTION

Smombie is a coined word for smartphone and Zombie. Smartphone addicts walk the streets without a soul, watching the smartphone walking around is a term referring to Zombies. But there are more dangerous body parts. I am a smartphone addict who drives a smartphone right after driving. In 2017, more than 200 accidents have occurred while driving and the number of accidents is increasing. An accident that occurs while using a smartphone while driving is likely to be a human injury or a large-scale accident. It is not an exaggeration to say that a driver of a motorcycle is a criminal act along with a drunk driver because a driver of a motorcycle walking around is usually accused. In other words, the walking mug is mainly victim and the driving mug riders are the perpetrators. Many people use smart phones while driving large trailers, small and medium sized cars and even motorcycles without knowing these risks. Therefore, if there is an accident, serious accidents such as serious injury or death will occur. Accident prevention measures against the walking cost of walking are being studied steadily. It is a special walkway for Smombie, a warning sign for the prevention of stolen goods and a floor signal, a sign and a sticker. However, the accident prevention program for drivers who are driving motorbikes is all about the system or interdiction and now only the driver mode is used for the smartphone application. In this study, we propose and propose a system that actively prevent accidents of drivers who are passive only. The research method is to control the interaction between the driver's seat and the smartphone and furthermore to detect the traffic lights, attention signs, crosswalks and lanes of the road through communication with the inside of the car (Jae-Hoon, 2000; Soon-Hee, 2015; Cho *et al*., 2014; Lee *et al*., 2018; Jeong and Bae, 2007; Sung-Hoon and Myung-Jin, 2007).

MATERIALS AND METHODS

Current status of smombie drivers: Jiranjigyo Software, a developer of X-keeper for youth smartphone management software, conducted a questionnaire survey of 528 Facebook users asking which driver is most dangerous. As a result, the most dangerous driver is said to be a driver who uses a smartphone while driving next to a drunk driver. Of the 528 people surveyed, 327 (61.9%) pointed to drunk drivers, followed by 156 (29.5%)smartphone users, 19 (3.6%) signaling offenders and 12 (2.3%) and 14 others (2.7%). These results suggest that drunk driving is the most socially problematic issue and is the result of the most severe legal punishment. It is

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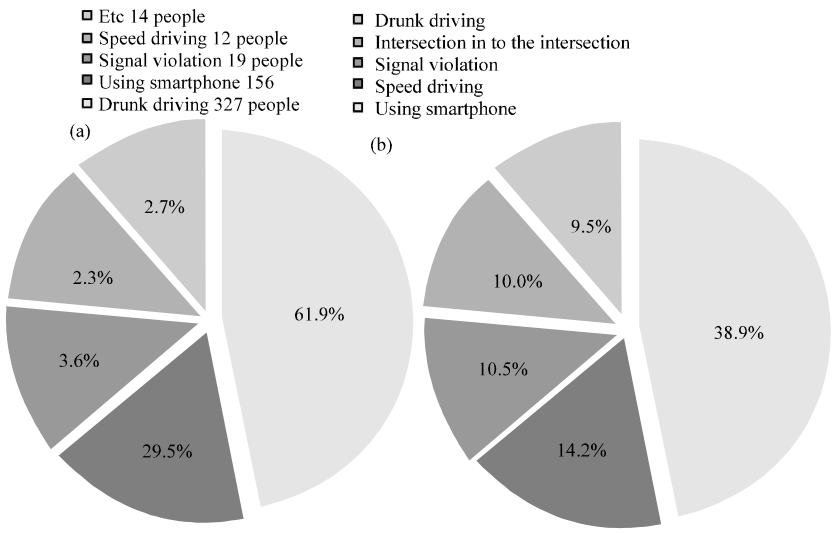

Fig. 1: Scope of dangerous driving awareness and personal safety driving violation questionnaire results: a) Dangerous driver perception and b) Personal safety driving violation cases

fortunate to see the smartphone user as the second most dangerous driver. However, unlike predictions, smartphone accidents during driving did not realize that they were much more dangerous and frequent than alcohol-driven accidents.

According to the traffic accident statistics survey conducted by the National Police Agency in 2017, 68.8% of deaths attributable to negligent driving negligence in the violation of the safety driving duty such as smartphone or navigation operation during driving than the drunk driving accident, respectively. If so, let's look at the order in which most driver's safety driving violations are distributed. According to the National Traffic Safety Awareness Survey conducted by the Hyundai Maritime Transportation Climate and Environment Research Institute in 2017, the most common use of smart phones (38.9%) was the driver safety violation experience. Followed by over speed (14.2%), signal violation (10.5%), crossing tail (10.0%) and drunk driving (9.5%).

In this way, the most common cases of habitual violations of driving motorists who use smartphones while driving are why do they perceive that drunk driving is the most dangerous in practice?. This is probably due to the widespread trend of smombie driving which is less social than drunk driving. The use of smartphones during driving should be nationally acknowledged to be more dangerous and frequent than drunk driving and rigorous measures should be taken (Kyu-Young and Yoon-hee, 2014; Lee *et al*., 2008) (Fig. 1).

RESULTS AND DISCUSSION

Risk of accidents caused by drivers: Korea has been forced to busy everyday life through the process of industrialization, so fast that it was once used as a buzzword. In such a busy day, I had to do a lot of things at the same time and I produced a driver who was free of phone calls, text messages and searches while driving. If the driver is currently the most severely punished by law, this is the case of drunk driving. Drunk driving is a murder and recognizes that it is a criminal act that destroys the home and others as well as the family. In fact, in the case of drunk driving, it is imposed a prison sentence of 3 years or less and a fine of 10 million won or less. In addition, it demands huge administrative responsibilities, such as revoking driver's license and greatly increasing premiums.

On the other hand, even if a smartphone is used while driving, it will be penalized with a penalty of 15 points for a penalty of 70,000 won. In fact, drunk driving is dangerous because it is very dangerous to lead to a major fatal accident in the case of excessive drinking, so, we are warned by strict punishment but the number of accidents is relatively small compared to other accidents. The reason why there are fewer cases of drunk driving accidents is that most of them think that they can be subject to severe heavy penalties (Fig. 2).

However, the use of smartphones during driving is also a result of mild punishment and is easily committed by the habit of using smartphones as though they were addicted. However, as traffic accidents caused by the use

Fig. 2: Smombie driver case: a) Bus Smombie driver; b) Passenger car muddy driver and c) Motorcycle driver

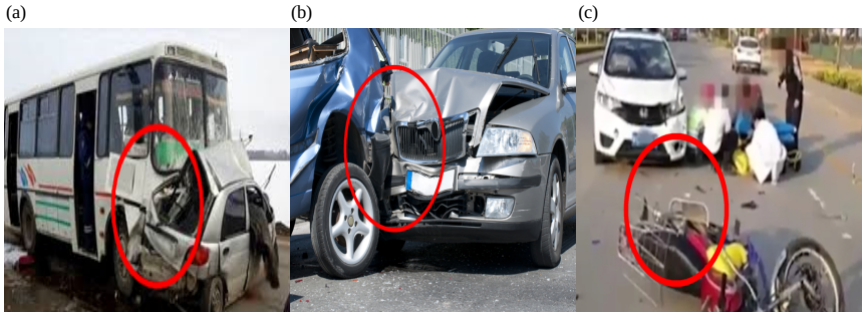

Fig. 3: Smombie driver accident case: a) Bus Smombie accident; b) Car smombie accident and c) Motorcycle smombie accident

of smartphones are increasing during driving, the view that more severe punishment is required is increasing. Recent studies have shown that the driver's body ratio is never lower than the drunk driving in terms of the degree of danger, since, the viewing angle is narrowed and the concentration is reduced during driving. According to the US Road Traffic Safety Authority, the degree of driving deterioration due to the use of mobile phones during driving is 0.08% of blood alcohol which is the license suspension. In addition, the Korea Highway Traffic Safety Administration conducted an experiment on the use of smartphone while driving. As a result, if the smartphone screen liquid crystal was checked for 2 sec while driving at 60 km/h, the result was the same as when the vehicle was closed about 34 m.

This is similar to drowsiness driving which is a high risk of accidents. The results of this study are as follows. In Article 49 of the Road Traffic Act, the driver should not use the smart phone except for the case where the car is stopped, the emergency car is driven, the case where there is an urgent business such as a report of a crime or a disaster, The National Assembly decided to ask for a revision to the law requiring a drastic correction of the penalty of up to KRW 70,000 and the imposition of 15 penalties. Currently, mobile phones are used more strictly as a measure to imitate a mobile phone in the hands of a penalty of 1 million is charged with the content. The British government recently passed a bill that would give life expectancy to drivers who died from the use of smartphones during driving.

The reason for this is that the driver of a smartphone is more likely to drink alcohol than driving. In the case of France, the use of smartphones is prohibited in the automobile except for the handsfree, regardless of whether driving or stopping. Japan is required to impose a prison sentence of up to three months or a fine of up to 50,000 yen, even if it does not cause an accident when using a smartphone while driving. It is a global trend to view smartphones during driving as an act that occurs in addicted habits and should be regarded as a serious criminal act that can not be remedied and isolated from society (Fig. 3).

Accident prevention measures for smombie driver: In Korea, legislation prohibiting the manipulation of various digital devices during driving has been enacted in 2012 and has been in force, since, March 2013. If you are caught driving a device such as a smart phone or a DMB during driving, you will receive a penalty of 15 points regardless of the penalty of 40,000 won for the motorcycle, 60,000 won for the passenger car, 70,000 won for the van. However, due to the consciousness that it should be avoided only by enforcement, the number of accidents using smartphone during driving continues to increase, reaching about 200 cases a year. In the United

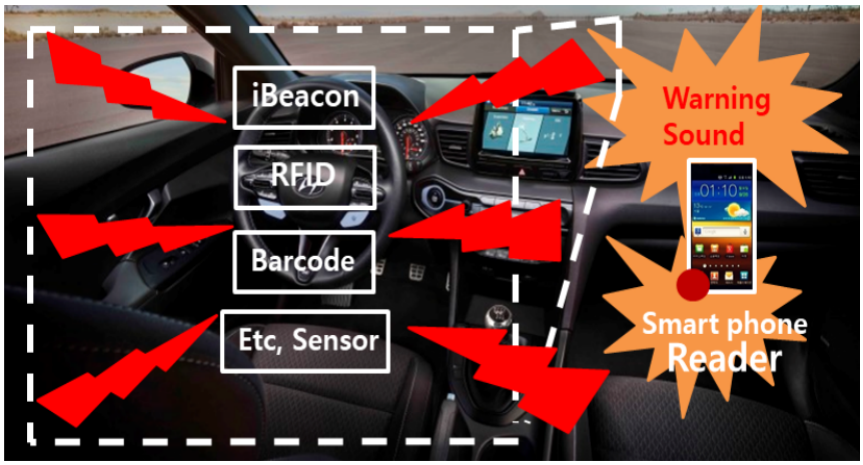

Fig. 4: Smartphone detection system in the driver's seat

States, about 10% of traffic accident deaths are caused by accidents caused by smartphone use and carelessness during driving and they are taking extraordinary measures because they are increasing by about 10% every year. In the United States, the driver's mode for preventing smartphone accidents is an unusual measure to prevent the smartphone's ability to communicate with the smartphone maker and car maker It is said that it will be introduced by request.

It is the application of the driver mode function that the driver does not make hands-free phone call or reception, use the navigation app while driving and input characters, search the Internet and play video. The smartphone app also has a function that allows you to automatically reply to the other party that the car is in operation even if the character is read while the car is in the car and the passengers can not be distinguished from each other, the functions are limited and there is no enforcement, so, it is necessary to secure hardware functional security (Se-Bin, 2014).

Since, smartphone makers in Korea are also influenced by the United States, we expect that the driver mode to be implemented in the United States will be introduced and settled quickly. In addition, in this study, we have studied a system that allows the driver to generate a strong beep when using a smartphone and to detect an external danger and receive a warning signal. Driver mode technology and Smombie driver prevention accident warning system is an important technology that detects whether the driver uses the smartphone in the driver's seat of the car or the bi-directional detection system that detects whether the smartphone is in operation. Such a bidirectional sensing system will be used for various beacon, RFID, barcode and various sensor technologies. The principle is implemented by the reader of the smartphone sharing sensors and natural frequencies in the driver's seat. It is possible to notify the driver who is selling at a glance through the location tracker or communication and to notify the driver of various warning signals of the outside or inform that the crosswalk is approaching in synchronization with the navigation (Fig. 4).

When a smartphone is detected around the driver's seat, the system calls for mutual communication between the ECU and the smartphone of the car to operate only basic functions and generates a warning sound using the vibration and sound of the smartphone. A variety of infrastructure technologies are needed to interact with automobiles and smartphones that detect smartphones in the driver's seat or detect the presence of vehicles in smartphones. In addition, a wider range of sensor technologies should be utilized to warn drivers of potential hazards to their smartphones.

In order to prevent accidents in driver's accidents, iBeeacon, Radio Frequency Identification (RFID), barcode and various sensor technologies are used in the alarm system. The beacon is a Bluetooth protocol based short-range wireless communication device that can communicate with devices within a maximum distance of 70 m and distinguish objects in 5~10cm units. It consumes less power and can be used for all devices or Internet of Things (IoT) for a long time. RFID is a next-generation object recognition technology using semiconductors. Information is stored in ultra-compact tags which are concentrated on semiconductor technology and information is recognized quickly and reliably because it uses reader frequency freely via. antenna. Transportation cards, high pass, book management and logistics, distribution, transportation and military. Beacons and RFID systems can detect situations such as outside traffic

lights and crosswalks in a car. The barcode is a reading system that displays English, numbers, special characters, etc. according to the standard of universal product code in a vertical bar with different thickness, so that, the machine can read it. Since, the reader can read by touching or approaching close, it is mainly used for calculation or inventory management by printing it on products or books. Other sensors can be used to read and respond to physical changes such as heat, light, temperature, pressure, sound, magnetism and smell. These sensors are used for automatic doors, automatic blinking lights, parking breakers, gas detectors and fire detectors that operate the sprinkler by detecting smoke in the form of smoke or heat. The barcode system and various sensor technologies play a role in controlling the driver's seat and the smartphone in the vehicle. RFID technology recognizes distant objects such as signposts and traffic lights inside the vehicle and beacon technology can also perform a warning function by reading crosswalks or lanes (Youn *et al*., 2002; Seung-Hee, 2016).

CONCLUSION

Drunk driving is the biggest punishment because it is an act of knowing that your mind and body may be out of control if you drink alcohol. Driving drowsiness can also be a big crime because you do not usually manage yourself, so, you can destroy good people and their families. Speedy driving is also the act of treating a car like a weapon without being able to control it. Rather, drunk driving can be controlled but it is also difficult to control sleepy driving and speeding. Nevertheless, penalties for drowsy driving and speeding driving are relatively weak compared to strong punishment for drunken driving. However, another driving behavior that is similar to these three kinds of murder driving has been increasing recently which is a big problem. It's just watching the smartphone while driving. The act of driving a car at the moment of viewing a smartphone is equivalent to a 0.08% gain in drinking and a few seconds of drowsy driving. If you look at a smartphone while driving on the highway, it may be that you are unconsciously over speed. The reason I see the smartphone while driving is that it is more addictive than the smartphone because it does not have to deal with busy things. Just as a drug addict is hard to break drugs, smartphone addicts cannot keep smartphones out of their hands. So, it is very likely that a person who has bought a smartphone will again have an accident with his smartphone. Such an addictive tendency requires a certain amount of coercive action to prevent accidental motor vehicle accidents. Therefore, in this study, the research for accident prevention of Smombie driver was conducted as a more compulsive and aggressive method. It is completely blocking the driver's seat in the car from the smartphone. In addition, research was conducted to check the danger situation outside the vehicle and to generate a warning sound. It is built with RFID technology, beacon technology and barcode technology as the main axis and it uses the sensor that uses heat, light, temperature, pressure, sound, magnetism, This study will be applied to three types of murder driving drunk driving, drowsy driving and speeding driving in various ways to contribute to reducing traffic accidents. The driver of a smartphone watching a smartphone while driving becomes a murder driving behavior that causes terrible accidents. Drivers themselves should be aware that they can become criminals and get out of their smartphone addiction sooner.

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