Driver Drowsiness Detection System

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Abstract: Road accidents and various other form of accidents are common nowadays which causes deaths. According to the data received from WHO approximately 1.3 million people dies in road accidents every year. Not only in India but also in other countries the number of accidents is very high. Most of the time road accidents happens due to driver's sleep. In this paper, a good intention to implement the driver drowsiness detection system which will help to reduce road accidents. This system is based on deep learning and with an accurate android application. We are tried here with lightweight structure of application which will get easy to handle to everyone.

Index Terms: Driver Drowsiness detection system, Android, Application

I. INTRODUCTION

Nowadays driver drowsiness is one of the main reasons of road accidents. According to National safety council (NSC) every year 100000 accidents were happening due to drowsy driving, according to the AAA approximately 9.5% drowsy driving contributes in all accidents. So, to stop or to reduce this much destruction this system is necessary. Making of Driver drowsiness detection system is a challenge for every automotive industry. Because of the complexity of application and due to the complexity of every vehicle it becoming difficult to design. Volvo had developed a system which detects the drowsiness also Mercedes had also designed a system which detect the pattern of driver's driving according to the movement of steering. As we can see this technology is not that much popular among drivers and in luxury vehicles it is inbuilt but for other vehicles it is not, so we are trying to make a simple small and easy to handle system which will help everyone to stop accidents.

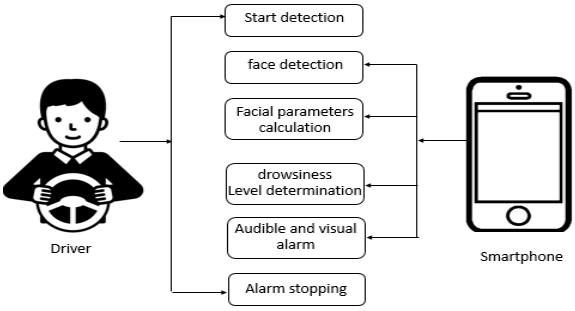
II. LITERATURE REVIEW

For Driver Drowsiness detection system there are various structures were get designed by various organizations, every organization has same purpose of reduce the number of accidents. Every structure work on different methodologies of detection. We have studied all the methodologies the basic of our structure is to detect the eyes of driver, some of the structure checks the steering movement and verify the lane of vehicle. This system processes the image of eyes and face and then give the results. The techniques take data from physiological sensors like Electrooculography (EOG), Electrocardiogram (ECG), Electroencephalogram (EEG) data. Data collected from EEG provides the information about brain's activities. There are three primary signals which measures the Driver Drowsiness level, the signals are Theta, Delta and alpha. Also, the other feature is, this application will check the facial expressions like gaze or eyes closure or yawning duration or head movement etc. using this it will fire the alarm. This method determines the level of drowsiness using the distance between eyelids. The calculation is done according to the number of blinks per minute if the number of blinks increases then the driver is getting drowsier.

III. DRIVER DROWSINESS DETECTION SYSTEM

Driver drowsiness detection system is basically designed to reduce the number of accidents caused due drowsy driving. This system is based on android. To increase the accuracy of this system various algorithms or ideas get proposed. In some ideas the system checks the eyes open or not, some detect the driving pattern of driver and then blow the alert. Our system is based on android were using thecamera of mobile we will detect the eyes of driver is open or not.

As we can see in above image the device or mobile containing driver drowsiness detection application will be placed in front if driver, on the steering which will continuously read the face of driver and watch the eyes of driver, if eyes get close it will fire the alarm immediately.



This is the representation of system that how it will work. The drowsiness detection application present in mobile will start the facial detection, it will determine the level of drowsiness and then it will fire an audible alarm which will help to alert every one present in the vehicle. We were connecting the mobile with Bluetooth which will increase the volume of alarm.

Working of Driver Drowsiness Detection System:
This system will work using an algorithm in which input and output will shown how it taken and get computed into result.

Steps:

1. Input taking in the form of image or video. Facial landmark and specifically selected area like eyes.
2. Take all the data required for detection.
3. Check the data and verify it that it is open or not.
4. If the eyes are closed then fire an audible alarm.
5. If the person off the alarm, then close it.

IV. EXAMPLES

A. Audi: Rest recommendation system.
B. BMW: Provides Active Driving Assistant which will analyse the body language of driver and recommends rest if needed
C. Bosch: It provides Driver Drowsiness Detection which checks the movement of steering wheel and also checks the facial expressions.
D. Citroen: AFIL/LDWS it uses various technologies some models checks the position of vehicle on road, some uses camera mounted on the steering.
E. Ford: Provides Driver alert system.
F. Kia: Driver attention warning system.
G. Volkswagen: Fatigue detection system.

V. APPLICATIONS

Driver Drowsiness Detection System has the main application of detecting whether the eyes are open or closed. This system is used to reduce the accidents happens due to the drowsy driving. This helps driver and other people to stay awake. This system fires an alert which is audible to everyone in car which indicates that driver is sleepy which will directly alert everyone about it

VI. CONCLUSION

Nowadays most of the accidents happen due to drowsy driving which we can reduce using this system. This is easy to use and simple to implement in every vehicle.

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