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# Drowsiness Detection of Driver Alerting Model using Deep Approach

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**ABSTRACT**

Drivers need to pay attention to road condition so that they can intervene immediately in an emergency. Driving while distracted is often the cause of some car accidents. Therefore we need a system that can detect and warn drivers about drowsiness thus reducing fatigue in accident. But in its development and implementation we will encounter many difficult problems, most often related to speed and accurately identifying symptoms of driver fatigue and drowsiness. One of the three possible ways to use the sleep detector is through visualization. In this article, we will also discuss technology to detect a drowsy driver. Fatigue, tired and exhausted drivers are the leading cause of accidents in India and abroad.

**Keywords*:*** - Drowsiness, Machine Learning, Support vector machine (SVM), CNN, Deep learning

## I. INTRODUCTION

Driver fatigue and sleepiness are one of the main causes of serious accidents. Drowsy drivers threaten road safety, sometimes resulting in serious injur y, death and financial loss. Drowsiness refers the situation where a person feels sleepy while driving, cannot concentrate, and the driver's eyes get tired. Most accidents in India occur due to driver inattention. Due to sleepiness, the driver's ability todrive deteriorates over time. To prevent these situations from occurring, we have developed a system that detects driver fatigue and warns immediately. Many people drive on the highway day and night. This i ncludes bus drivers, car drivers, taxi drivers and longdistance commuters, all of whom suffer from insomnia.Driving while tired due to lack of sleep is very dangerous.Driver fatigue and sleepiness are one of the main causes of serious accidents. Drowsy drivers threaten road safety, sometimes resulting in serious injury, death and financial loss. Drowsiness refers to the situation where a person feels sleepy while driving cannot concentrate, and the drive r's eyes get tired. Most accidents in India occur due to driver inattention. Due to sleepiness, the driver's ability to drive deteriorates over time. To preven t these situations from occurring, we have developed a system that detects driver fatigue & warns immediately. Many people drive on the highway day and night. This includes bus drivers, car drivers, taxi drivers and longdistance commuters, all of whom suffer from insomnia. Driving while tired due to lack of sleep is very dangerous.

## II. Literature Review

| Author | Year Of Publication | Title | Methodology | Result |
|---|---|---|---|---|
| Y.Dong, Z.Hu, N.Murayama and K.Uchimura | **2020** | Driver inattention Monitoring system for intelligent vehicles | He uses Infrared rays to detect drowsiness and more than 80% of test results were passed | This enables continuous language recognition and supports interaction over a full 720*576 frame in 16.7 seconds |
| S. Albayrak C. Billa, F. Sivrikaya, and M.A. Khan | **2020** | Vehicles of the future | Detects driver particularly and records data and produces alarm | This permits real time drowsiness detection And enable the system |
| A.Sahayadhas, K.Sundaraj, M.Murugappa | **2020** | Detecting driver drowsiness based on sensors | Complete Data process is done under algorithm and model compares to the value. | In this calculation, the k frame holds the edge information resulting from eye strabismus estimated by the edge measurement method to control the fatigue level. |

## III. METHODOLOGY

I. DROWSINESS DETECTION USING FACE DETECTION SYSTEM

Numbness can be distinguished by the position of the face. The process of identifying sleep in the facial area changes with fatigue. The characters in the face area become clearer and clearer, and we can detect the eye area. From an eye perspective, the designer said there are four types of eyelash extensions that can be used for lazy areas. They are obvious from fully open, fully closed, and where the eye goes from open to closed and vice versa.

II. YAWNING DETECTION METHOD

Accordingly, the sleeping person can often be identified by looking at his face and behavior. The develope found a way to detect the perpetual laziness from the position of the moon, so the image was prepared using ViolaJones' classification based on the face. Mouth and yawning pictures were prepared by comparing the pictures. Minorities cover their mouths with their hands while shouting

This system has many features that make it unique and functional. These features include:

1. Eye extraction, use open and close to determine sleepiness

2. Daytime and night detection

3. Real time image processing and detection

4. Sound and flashing LED warning system to redraw driver's attention

5. Little inference and potential hazard to driver's normal driving

6. Portable size with car cigarette charger socket power supply

## IV. WORKING PROCEDURE

System will capture the video directly from the webcam.

• After passing the feed of our video directly to the lib frame by frame, we are able to detect left eye and right eye features of the face.

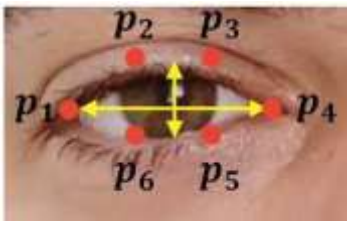
• Now, we draw contours around it using OpenCV.

• Using SciPy's Euclidean function, we calculate "Eyes aspect Ratio" E.A.R. and "Mouth Aspect Ratio" M.A.R.

EAR and MAR ratio

The deep learning model will also be trained for detecting blink and its output will be ensembled with EAR for detecting blink.

• If person is detected as yawning and blinking less than a threshold value, then the alarm is sounded and user is warned.

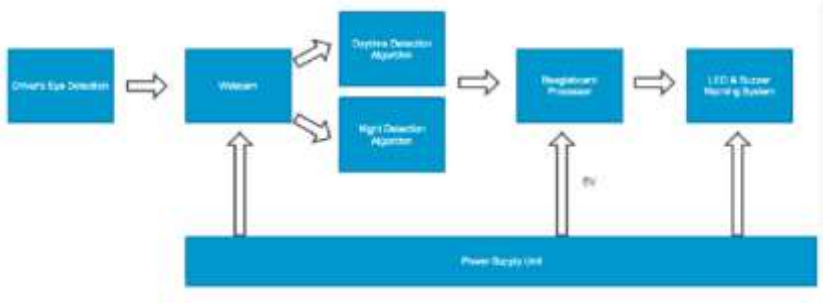



$$\mathbf{MAR} = \frac{\|p_2 - p_8\| + \|p_3 - p_7\| + \|p_4 - p_6\|}{2\,\|p_1 - p_5\|}$$

$$\mathbf{EAR} = \frac{\|p_2 - p_6\| + \|p_3 - p_5\|}{2\|p_1 - p_4\|}$$

## V. System Implementation

Record sleep and wakefulness data for two to three days before the test day. Participants were asked to sleep at least seven hours each night for three nights before the test. Both subjects participated on each experimental day. First to join at 14.00. Second time at 16:00. When participants arrive, they receive written and verbal information about the test and are asked to fill out a consent form and responsibility. They must also provide a driver's license and take a breathalyzer test. The test leader then uses electrodes to measure the body. All participants completed two driving lessons at each testing time: the first in the alert state and the second in the sleep state.



## SYSTEM TESTING

Software testing is defined as the job of checking whether actual results match the expected results and ensuring that the software system is troublefree. It involves operating a software component or system component to measure one or more items of interest. It can be done manually or using machine tools.

## CONCLUSION

Drivers create a crime tracking system suitable for detecting slow, drunk and careless behavior of drivers in a short time. Visual fatigue detection based on driver's eye judgment can distinguish between strabismus and laziness of ordinary eyes and detect fatigue while driving. The preparation process can prevent accidents caused by fatigue while driving. The frame works great even in driving conditions and it would be surprising if the camera delivers better results in good light situations.Information about the head and eyes isobtained through different self-generated image processing methods. During inspection,the system can choose to open or close the eyes. 59 warning lights are given when the eyes are closed for a long time. Do this by determining the drive arrangement for the eye extension's nuts and bolts.

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