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# Real Time Sleep/Drowsiness Detection

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**ABSTRACT:** The main idea behind this project is to develop a nonintrusive system which can detect fatigue of any human and can issue a timely warning. Drivers who do not take regular breaks when driving long distances run a high risk of becoming drowsy a state which they often fail to recognize early enough. According to the expert's studies show that around one quarter of all serious motorway accidents are attributable to sleepy drivers in need of a rest, meaning that drowsiness causes more road accidents than drink-driving. This system will monitor the driver eyes using a camera and by developing an algorithm we can detect symptoms of driver fatigue early enough to avoid the person from sleeping. So, this project will be helpful in detecting driver fatigue in advance and will give warning output in form of alarm and popups. Moreover, the warning will be deactivated manually rather than automatically. For this purpose, a de- activation dialog will be generated which will contain some simple mathematical operation which when answered correctly will dismiss the warning. Moreover, if driver feels drowsy there is possibility of incorrect response to the dialog. We can judge this by plotting a graph in time domain. If all the three input variables show a possibility of fatigue at one moment, then a Warning signal is given in form of text and sound. This will directly give an indication of drowsiness/fatigue which can be further used as record of driver performance.

**Keywords-** - Drowsiness, Supervised Learning, Unsupervised Learning, Machine Learning.

## I. INTRODUCTION

Real Time Drowsiness behaviors which are related to fatigue are in the form of eye closing, head nodding or the brain activity. Hence, we can either measure change in physiological signals, such as brain waves, heart rate and eye blinking to monitor drowsiness or consider physical changes such as sagging posture, leaning of driver's head and open/closed state of eyes..

### 1.1Introduction to the project

The former technique, while more accurate, is not realistic since highly sensitive electrodes would have to be attached directly on the driver' body and hence which can be annoying and distracting to the driver. In addition, long time working would result in perspiration on the sensors, diminishing their ability to monitor accurately. The second technique is to measure physical changes (i.e. open/closed eyes to detect fatigue) is well suited for real world conditions since it is non-intrusive by using a video camera to detect changes. In addition, micro sleeps that are short period of sleeps lasting 2 to 3 minutes are good indicators of fatigue. Thus, by continuously monitoring the eyes of the driver one can detect the sleepy state of driver and a timely warning is

### 1.2Motivation

A study (In the U.S) showed that **37% of drivers** surveyed admitted to falling asleep at the wheel.
An estimated **1.35 million** drivers have been involved in a drowsy driving related crash in the past five years.
**Fall-asleep crashes are likely to be serious.** The morbidity and mortality associated with drowsy-driving crashes are high, perhaps because of the higher speeds involved (Horne, Reyner, 1995b) combined with delayed reaction time.

### 1.3Problem Identification

There are various reasons for accidents on road. The major reasons for accidents on road are fatigueness of driver.
It is live project work then possibility of existing system score is minimum valuable.
It is challenging to execution maximum possibility creation.

### 1.4Algorithms

1.ALGORITHM 1: AdaBoost algorithm
The AdaBoost algorithm for classifier learning is demonstrated. Each round of boosting selects one feature from the 180,000 potential features.

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Objectives • To detect the level of fatigue of the driver and alerting them. • To detect the alcohol intoxication level of the driver

ALGORITHM 2: DROWSINESS DETECTION ALGORITHM
The general flow of our drowsiness detection algorithm is fairly straightforward.
1. First, a camera is setup that monitors a stream for faces.
2. If a face is found, facial landmark detection is applied to extract the eye regions.
3. The eye regions are used compute the eye aspect ratio to determine if the eyes are closed.
4. If the eye aspect ratio indicates that the eyes have been closed for a sufficiently long enough amount of time, sound an alarm is used to wake up the driver and the indicators will be on to indicate the pillion drivers.

## II. 2.OBJECTIVES

1. The objective is to overcome the problem related to the accident related to the driver experiencing fatigue leads to a need arises to design a system that keeps the driver focused on the road.
2. Therefore many designs and prototypes have been implemented in automobiles to avoid such accidents by keeping the whole focus and concentration on accurately monitoring the open and close state of the drivers eye in real time.

## III. LITERATURE REVIEW

### 3.1Existing System

Drowsiness of drivers is one of the significant cause of road accidents. Every year, there is an increase in the amount of deaths and fatal injuries globally. By detecting the driver's drowsiness, road accidents can be reduced. This paper describes a machine learning approach for drowsiness detection. Face detection is employed to locate the regions of the driver's eyes, which are used as the templates for eye tracking in subsequent frames.

### 3.2Disadvantages of Existing System

1. Use of spectacles: In case the user uses spectacle then it is difficult to detect the state of the eye. As it hugely depends on light hence reflection of spectacles may give the output for a closed eye as opened eye. Hence for this purpose the closeness of eye to the camera is required to avoid light.
2. Multiple face problem: If multiple face arises in the window then the camera may detect more number of faces undesired output may appear. Because of different condition of different faces. So, we need to make sure that only the driver face come within the range of the camera. Also, the speed of detection reduces because of operation on multiple faces.

## IV. PROPOSED SYSTEM DESIGN

### 4.1 Analysis of problem

In this system Drowsiness of drivers is one of the significant cause of road accidents. Every year, there is an increase in the amount of deaths and fatal injuries globally. By detecting the driver's drowsiness, road accidents can be reduced. This paper describes a machine learning approach for drowsiness detection. Face detection is employed to locate the regions of the driver's eyes, which are used as the templates for eye tracking in subsequent frames. To avoid this we have implemented The main idea behindthisproject is to develop a nonintrusive system which can detect fatigue of any human and can issue a timely warning. Drivers who do not take regular breaks when driving long distances run a high risk of becoming drowsy a state which they often fail to recognize early enough. According to the expert's studies show that around one quarter of all serious motorway accidents are attributable to sleepy drivers in need of a rest, meaning that drowsiness causes more road accidents than drink-driving.

### 4.2Problem Definition

This system will monitor the driver eyes using a camera and by developing an algorithm we can detect symptoms of driver fatigue early enough to avoid the person from sleeping. So, this project will be helpful in detecting driver fatigue in advance and will give warning output in form of alarm and popups. Moreover, the warning will be deactivated manually rather than automatically.
we can either measure change in physiological signals, such as brain waves, heart rate and eye blinking to monitor drowsiness or consider physical changes such as sagging posture, leaning of driver's head and open/closed state of eyes..

### 4.3Design

This technique is an intrusive method wherein electrodes are used to obtain pulse rate, heart rate and brain activity information. ECG is used to calculate the variations in heart rate and detect different conditions for drowsiness. The correlation between different signals such as ECG (electrocardiogram), EEG (electroencephalogram), and EMG (electromyogram) are made and then the output is generated whether the person is drowsy or not.

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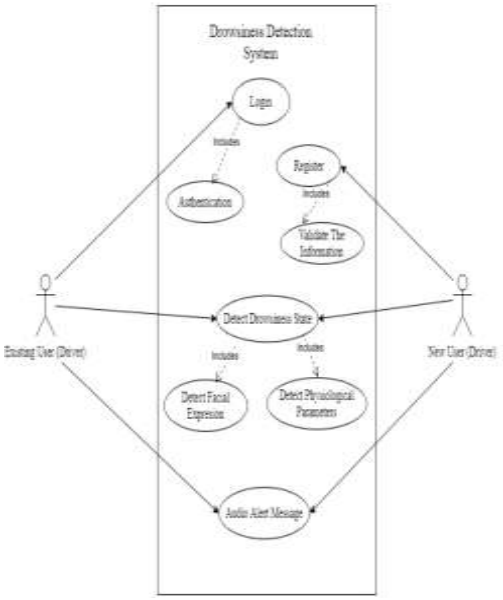

Fig: Use case diagram.

## V. CONCLUSION AND FUTURE SCOPE

### 5.1 Conclusion

A real-time eye blink detection algorithm was presented. We quantitatively demonstrated that Haar feature-based cascade classifiers and regression-based facial landmark detectors are precise enough to reliably estimate the positive images of face and a level of eye openness. While they are robust to low image quality (low image resolution in a large extent) and in-thewild. This paper experimented in a bright room with constant light. In addition, there were several limitations including light conditions and the darkness of the skin.

### 5.2 Future Scope

Our model is designed for detection of drowsy state of eye and give and alert signal or warning in the form of audio alarm. But the response of driver after being warned may not be enough to stop causing the accident meaning that if the driver is slow in responding towards the warning signal then accident may occur. Hence to avoid this we can design and fit a motor driven system and synchronize it with the warning signal so that the vehicle will slow down after getting the warning signal automatically.

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