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DRIVER DROWSINESS DETECTION SYSTEM USING M

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ABSTRACT

People are unable to get a full night's sleep in today's fast-paced society. As a result, when people drive after a sleepless night, they might fall asleep behind the wheel, which can be quite dangerous. Drowsy driving is responsible for a number of accidents each year. Drowsiness while driving are quite dangerous, and it might be difficult to spot. After alcohol, drowsiness is the second leading cause of death of car accidents. People are aware of the consequences of drinking and driving, but they are unaware of the risks of tiredness because no technologies exist to detect drowsiness. If the driving factor fails to focus on driving, the response time of such driving force is decreased, and steering performance is affected. Driver drowsiness can result in various of physical and financial repercussions. Many crashes involving vehicle crashes are caused by a driver's low level of awareness. Driver drowsiness due to poor sleep or sleep problems is a largest source to the increasing frequency of accidents on today's roads. A system that relies on a driver's drowsiness warning system may effectively reduce accidents accidents caused by human tiredness. The purpose of a system seems to be to identify driver fatigue. By embedding a camera inside the vehicle, we will be able to monitor the driver's face and check for eye movements that indicate that the driver is not paying much attention. In such a case, a alarm should be issued.

Keywords: Drowsiness Detection, Face Detection And Tracking.

I. INTRODUCTION

Because of the apparent decline in drivers' perception of risk and identification of danger, drowsy driving has been a prominent component in many of the accidents. Physical as well as physiological changes occur as a result of driver sleepiness, with physical changes involving sleeplessness and physiological changes involving the rate at which the driver acts and reacts. When a motorist is too weary to stay awake, it is called driving drowsiness. As a result, the driver's reaction time may be slowed, his or her alertness may be diminished, and his or her thinking may be hampered.

In the worst-case scenario, the driver may nod off while driving. To that aim, research into detecting driver drowsiness is critical for increasing road traffic safety and is a large and active study topic.

II. LITERATURE SURVEY

Sr No.	Reference Name	Work description	Problems found
1	DrowsyDet: A Mobile Application for Real-time Driver Drowsiness Detection	Using the camera on the driver's phone as a monitor the driver.	Less time to Monitoring cause of depends on the phone battery
2	Driver Drowsiness Detection Percentage Eye closure method	Detects Eye-Blink based on different scenarios	Doesn't detect Eye when person wears Eye glasses
3	Driver Fatigue Detection	It captures every small facial expression	It doesn't give any alert, only detects drowsiness
4	Driver Drowsiness Detection Using Visual Information on Android Device	Monitors Driver, Lane and speed of the	The use of an electrode helmet is

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		Vehicle	required.
5	Drowsy Driver Detection System	Driver's state is detected using iris and pupil color	Detects Drowsiness only on behavioral factor.

III. RELATED WORK

Identification of the driver drowsy by:

1. Image is Captured from camera
2. Face detection and cropping of face
3. Morphological processes
4. Drowsiness Detection of Driver
5. Gives Alarm

For eye detection, we used facial feature prediction in the system. Facial landmarks are being used to identify and represent significant facial features like the eyes, brows, nose, and mouth.

Face alignments, head human pose, face swapping, blink recognition, and other activities have all been successfully accomplished using facial landmarks. Our goal inside the context of feature points is to use a shape prediction algorithm for detecting essential facial structures on the face. The process of detecting facial landmarks involves two steps:

1. Determine the location of the face in an image.
2. Recognize the vital facial structures here on face.

The below facial landmark index can be used to identify and access both eye regions:

- The right eye using [36, 42].
- The left eye with [42, 48].

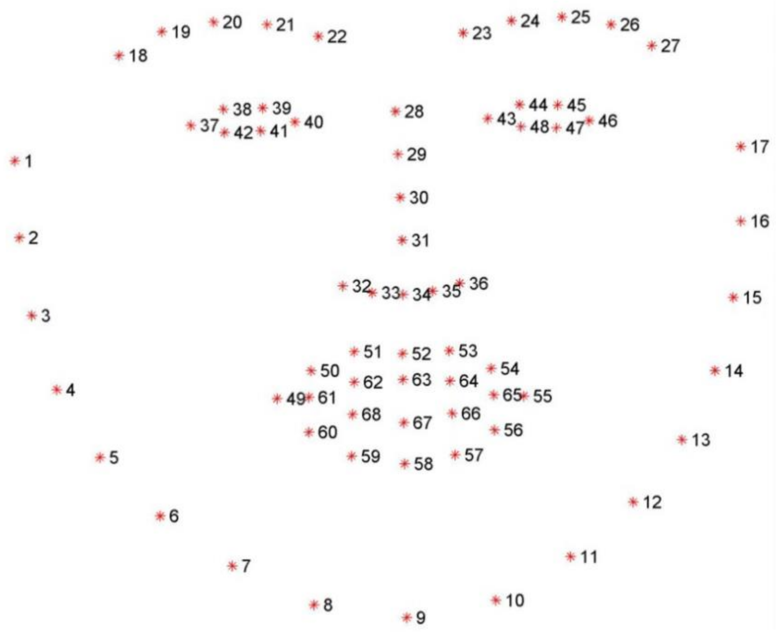

Fig 1: The 68 facial landmark coordinates are visualised.

IV. BLOCK DIAGRAM

Those remarks are part of a 68-point set that used train the dlib facial landmark predictor. It's worth noting that there are other types of facial landmark detectors, such as the 194-point model which can be trained using the dataset. The very same dlib framework can be used to build a shape predictor on the inputs training examples irrespectively of which dataset is used.

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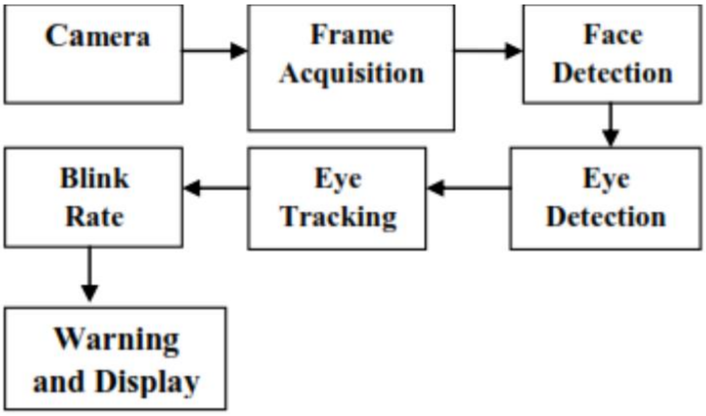

Fig 2: Block diagram

Eye shutting, head nodding, and brain activity are all examples of real-time drowsiness behaviours. We can identify exhaustion by measuring physical changes such as open/closed eyes using a video camera. This method is well suited for real-world settings because it is non-intrusive. Micro sleeps, which are brief sleeps lasting 2 to 3 minutes, are also good indicators of exhaustion. Thus, by continuously monitoring the driver's eyes, the sleepy state of the driver can be detected and necessary action taken with the help of the buzzer.

When the user starts driving, the camera begins to work and constantly monitors the user's facial characteristics. After that, detection will begin using the HAAR Method. To train a classifier, the algorithm includes a large amount of positive images [images with faces] and negative images [images without faces]. After that, we must features extracted from it. They're really similar to our convolution kernel. Every feature is a single value calculated by subtracting the sum of pixels under the white rectangle from of the total of pixels beneath the black rectangle. For eye detection, we employed facial landmark predictions. Facial landmarks are being used to identify and represent important facial features. When the user falls asleep, the buzzer in front of the driver senses this and beeps.

V. SYSTEM DIAGRAM

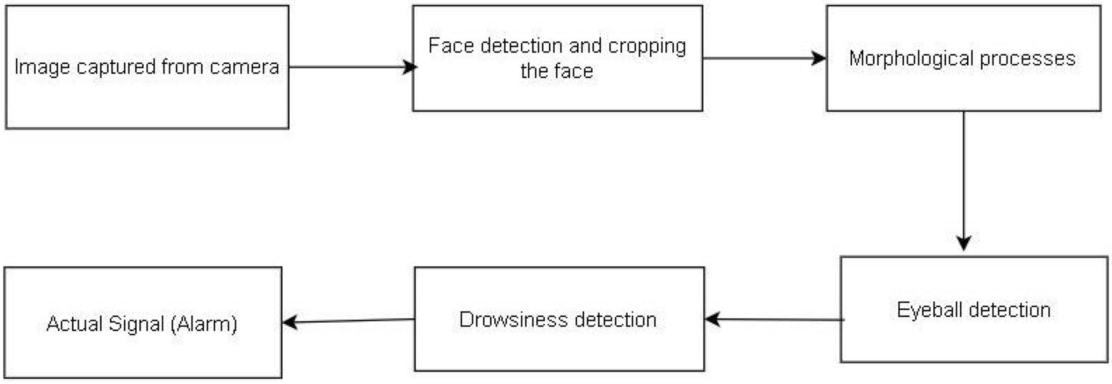

Fig 3: System diagram

Haar feature-based cascade classifier are indeed an efficient object detection method for face detection. To train a classifier, the algorithm includes a large amount of positive images [images with faces] and negative images [images without faces]. After that, we must features extracted from it. They're really similar to our convolution kernel. Each feature is an unique value calculated by subtracting the sum of pixels beneath the white rectangle from the total of pixels beneath the black rectangle. For eye detection, we used facial landmark prediction. Facial landmarks are being used to identify and portray important facial features such as the eyebrows, nose, and mouth.

Optical flow, sparse tracking, and frame-to-frame intensity differencing and adaptive thresholding can all be used to estimate the eye area. The EAR is used to make a choice about the eye status. The eye state is classified as "closed" if the distance was zero or close to zero; otherwise, the eye state is classified as "open." When the eyes are closed for five seconds and repeat, the system detects drowsiness and starts beeping the buzzer.

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VI. PROPOSED ALGORITHM

HAAR cascade Algorithm:

The following is an explanation of the algorithm:

- Calculating Haar Features
- Creating Integral Images
- Using Adaboost
- Implementing Cascading Classifiers

VII. PSEUDO CODE

Begin

Input driver's video

ClosedEyeCount:=0

For every tenth frame in video Do

Localize eyes

Chcek status of eyes

If eyes are closed Then

ClosedEyeCount:=ClosedEyeCount+1

Else If eyes are open Then

ClosedEyeCount:=0

End If

If ClosedEyeCount==3 Then

Generate Alarm

ClosedEyeCount:=0

End If

End For

End

VIII. SIMULATION RESULTS

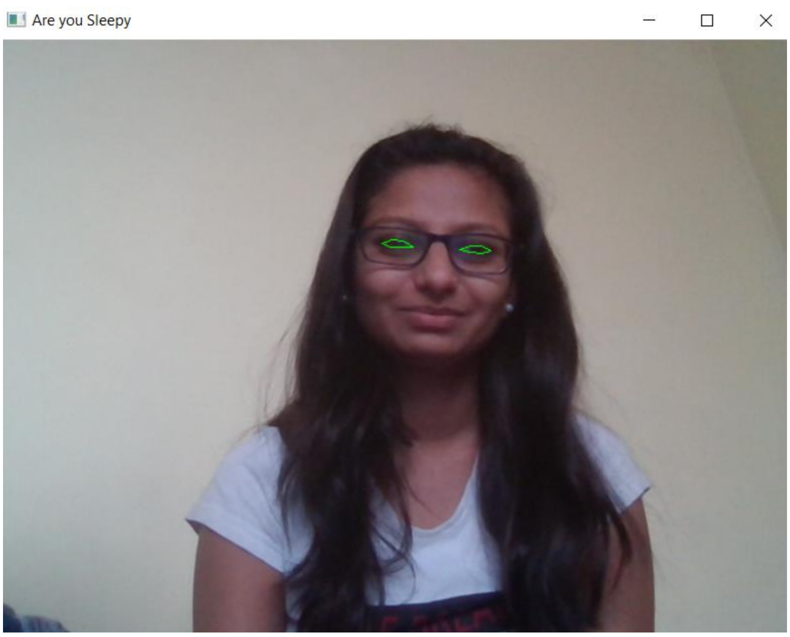

Fig 4: Eye Detection

Fig 4 reveals that EAR is used to make the eye detection decision. The eye state is characterised as "closed" if the distance is zero or close to zero; otherwise, the eye state is classified as "open."

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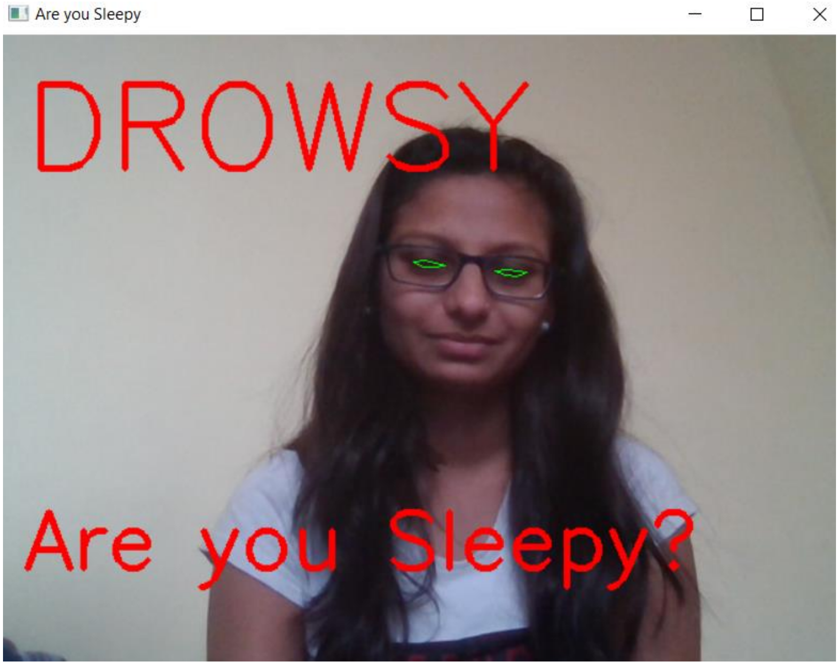

Fig 5: Drowsiness Detection

Fig 5 displays the detection of drowsiness It detects tiredness and beeps the buzzer if the person is asleep

IX. CONCLUSION

Driving when drowsy is becoming a major problem. In our country, there are numerous highway accidents. We need a technology that can inform us and verify whether the driver is drowsy or not to prevent these accidents. Such road accidents could be avoided with the improved system, saving countless lives. In a virtual scenario, we discussed the several ways that tiredness can be managed. Subjective, vehicle-based, physiological, and behavioural indicators are among the many ways to identify drowsiness. Although physiological measures have a high accuracy rate for detecting drowsiness, they are extremely intrusive. Contactless electrode insertion, on the other hand, can typically alleviate this intrusiveness. Contactless electrode insertion, on the other hand, can typically alleviate this intrusiveness. As a result, in the creation of an effective sleepiness detection system, it may be worthwhile to combine physiological indicators such as ECG with behavioural and vehicle-based measures. In order to achieve optimal results, it's also necessary to consider the driving environment. We intend to expand our dataset to include more complicated and diverse driving scenarios in the future to increase generalisation and use model pruning technology to speed up our mobile app.

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