ABNORMAL DRIVER AND THEFT ALERT SYSTEM USING DEEP LEARNING TECHNIQUES

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ABSTRACT

Based on the drowsiness and fatigue of automobile drivers, it will reduce the driver's abilities of vehicle control, natural reflex, recognition and perception. Real-time detection and tracking of the eye is an active area of research in computer vision community. Localization and tracking of the eye can be useful in face alignment. It describes real time eye detection and tracking method that works under variable and realistic lighting conditions. Then recognize the face also to authorize the person and also provide the alert about unauthorized access. It is primarily based on a hardware device for the real-time acquisition of a driving force's snap shots the use of digital camera and the software program implementation for monitoring eye that can avoid the accidents.

I. INTRODUCTION

Sleepiness at some stage in using is a chief motive for road accidents. Road accidents are absolutely turning into a growing situation in many nations due to the fact they're rising to turn out to be one of the main causes of demise and accidents. Most human beings concept that drunken using is the severe motive of injuries and ignorant of drowsy riding which is just deadly. Additionally deteriorates vigilance, attention and alertness in order that the capacity to carry out distinctive cognizance-based totally sports is impaired, decreases attention, reduces judgment and will increase the hazard of crashing. Road injuries precipitated due to driver fatigue is greater extreme and results in demise aside from drunken riding and rush driving accidents because of drowsiness is extra crucial due to the fact the driving force is loss the focus which leads to extreme injuries or demise.

II. PROBLEM DESCRIPTION

Improvement of public safety and the decrease of accidents are of the vital areas of the Intelligent Transportation Systems (ITS). One of the most significant factors in accidents, specifically on rural roads, is the driver tiredness. Exhaustion diminishes driver insights and decision making ability to control the automobile. Drowsiness and fatigue of automobile drivers reduce the drivers' abilities of vehicle control, natural reflex, recognition and perception.

Therefore it is very much necessary in this recent trend in automobile industry to incorporate driver assistance system that can detect drowsiness and fatigue of the drivers. This project presents a nonintrusive prototype computer vision system for monitoring a driver's vigilance in real time. Eye tracking is one of the key technologies for future driver assistance systems since human eyes contain much information about the driver's condition such as gaze, attention level, and fatigue level.

The aim is to reduce as many as accidents & let every driver can able to drive safely. This project describes real time eye detection and tracking method that works under variable and realistic lighting conditions. It is based on a software system for the acquisition of a driver's images using camera and implementation for monitoring eye that can avoid the accidents. Driving at night has become a tricky situation with a lot of accidents and concerns for the transport authorities and common man especially because of the increasing heavy vehicle movement. The drivers are forced to drive with minimal rest which takes a toll on their driving capability after a few days of continuous driving leading to reduction in their reflexes and thus causing accidents. In most of the cases of accidents, fatigue is found to be the reason for nodding off. The term fatigue refers to a combination of symptoms such as impaired performance and a subjective feeling of drowsiness. Even with the intensive research that has been performed, the term fatigue still does not have a universally accepted definition.

III. THE PROSPECTIVE SYSTEM

Driving at night has become a tricky situation with a lot of accidents and concerns for the transport authorities and common man especially because of the increasing heavy vehicle movement. The drivers are forced to drive with minimal rest which takes a toll on their driving capability after a few days of continuous driving leading to reduction in their reflexes and thus causing accidents.

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From the viewpoint of individual organ functionality, there are different kinds of fatigue, such as the following cases:

- Local physical fatigue (e.g., in a skeletal or ocular muscle).
- General physical fatigue (following heavy manual labor).
- Central nervous fatigue (sleepiness).
- Mental fatigue (not having the energy to do anything).

In this proposed system, to implement the system for detecting the faces using Linear discriminate analysis and also track the eyes states with improved accuracy. In case of abnormal behaviour that is drivers eyes found to be closed as a corrective action alarm signal will be raised.

The system enters into analysis stage after locating the driver's head and eyes properly in image captured through camera. This image is then pre-processed using various Image Processing techniques for drowsiness detection.

After pre-processing, facial features are extracted in both (Wearing mask and no mask) states. Eye features are detected based on inter and intra class variants for all peoples. Finally provide alert system in the form of voice, SMS and Email alert admin with face recognition.

Design the system for detecting various ability of a driver. Face detection using HAAR Cascade algorithm . Including Linear Discriminate Algorithm (LDA) to detect faces for analyzing facial features. Visual Eye Monitoring system is used to track the nature of the eyes, such as open, close state of eye state. Convolution Neural Network (CNN) algorithm using driver abnormal state. Send the alert system to admin at the time of abnormal state by message. Capture the abnormal face images and it should forwarded to the admin through mail. Implement face recognition system to predict the unknown person.

SYSTEM ARCHITECTURE

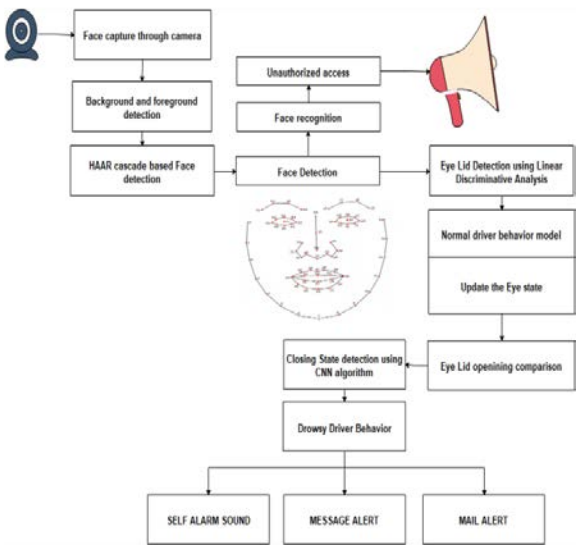

Fig:Overall System Architecture

SYSTEM ARCHITECTURE DESCRIPTION

INTERFACE CREATION

The advancement of technologies for averting drowsiness at the wheel is a key dilemma in the field of accident prevention systems. Preventing drowsiness during driving necessitates a scheme for precisely perceiving deterioration in driver's vigilance and a means for alerting and reviving the driver. Drowsy Driver Detection System has been developed, using a non-intrusive machine vision based concepts. This system offers a method for driver eye detection, which could be used for observing a driver's fatigue level while he/she is maneuvering a vehicle. In this module, we can capture the driver faces from real time camera. The driver face can be registered in admin interface.

FACE CAPTURE

To capture and detect a face by using Linear Discriminate Analysis (LDA) algorithm. LDA is an enhancement of PCA (Principal Component Analysis). PCA doesn't use concept of class, whereas LDA does. Face images of same person is treated as of same class here. Both PCA and LDA do dimensionality reduction. They transform images as a vector to new space with new axes. The projection axes chosen by PCA might not provide good discrimination power. LDA tries to find projection axes, such as classes are best separated. First video can be captured and apply binarization tool to detect the background and foreground faces using facial features extraction algorithm. After the face detection predict the inter and intra class variants that contains the features vectors for eyes, noises, cheeks and so on.

EYE DETECTION

Each face detected is stored for half a second to crop the image in order to detect the eye in terms of wearing mask or glasses. Eye Lid detection using Linear discriminate algorithm (LDA) to detect the eye vector. This algorithm divides the face horizontally into two segments i.e. upper segment and a lower segment. Upper segment contains the image between the forehead to the eyes, and lower segment contains the image between the nose to the chin. We take into account the upper segment and lower segment is discarded. The upper segment again is divided horizontally into 2 segments, this time upper up segment from the forehead to an eyebrow and the upper lower segment from eyebrow to a lower eyelash. After the eyes have been extracted from the image it is then that the current frame is replaced by a new one. The eyes extracted are now categorized in two parts through vertical calibration - the left eye and the right eye.

ABNORMAL PREDICTION

After the eye has been detected, the next step is to detect the eyes condition either they are open or close, so for this purpose intensity values are used. A graph is plotted which calculates the intensity distance in the eye separately through the eye lashes and eye brow and check the state of an eye on this intensity distance. If distance is large, eye is close and when distance is less, eye is open. Convolution Neural Network (CNN) algorithm using 50% eye closing state . The distance can be evaluated by analyzing the samples of images. Both the eyes are binarized to determine the threshold value and then the results are produced. If the system encounters five consecutive frames with the eyes closed the alarm is triggered for the next five frames.

NOTIFICATION SYSTEM

In this module send notification to admin and also user at the time of abnormal prediction. If the eyes are closed less than 50% means, provide voice alert for self-assessment. Then send SMS alert using SMS gateway services. And also abnormal face can be capture in Email.

V. CONCLUSION

Drowsiness and fatigue of automobile drivers reduce the drivers' abilities of vehicle control, natural reflex, recognition and perception. Such diminished vigilance level of drivers is observed at night driving or overdriving, causing accident and pose severe threat to mankind and society. The proposed system can be used for driver's safety and its consequences. The system detects drowsiness of driver through eye conditions. It based on face detection using well known Linear Discriminative algorithm, eyes are detected through proposed crop Eye algorithm which segments the face in different segments in order to get left and right eye. Conditions of open and close eye are determined by intensity values, distance between eye brow and eye lash is calculated. If calculated distance is greater than threshold value, eyes are closed otherwise open. An alarm is triggered if eyes are found to be closed for

consecutive frames. The proposed method was tested in video sequence recorded in vehicle as well as in lab environment. The proposed system works in real time with minimal computational complexity. Therefore it is also suitable for implementing in surveillance environment.

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