DRIVER DROWSINESS DETECTION USING MACHINE LEARNING

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ABSTRACT:

Nowadays, accidents occur during drowsy road trips and increase day by day; It is a known fact that many accidents occur due to driver fatigue and sometimes inattention, this research is primarily devoted to maximizing efforts to identify drowsiness. State of the driver under real driving conditions. The aim of driver drowsiness detection systems is to try to reduce these traffic accidents. The secondary data collected focuses on previous research on systems for detecting drowsiness and several methods have been used to detect drowsiness or inattentive driving. Our goal is to provide an interface where the program can automatically detect the driver's drowsiness and detect it in the event of an accident by using the image of a person captured by the webcam and examining how this information can be used to improve driving safety can be used. . a vehicle safety project that helps prevent accidents caused by the driver's sleep. Basically, you're collecting a human image from the webcam and exploring how that information could be used to improve driving safety. Collect images from the live webcam stream and apply machine learning algorithm to the image and recognize the drowsy driver or not. When the driver is sleepy, it plays the buzzer alarm and increases the buzzer sound. If the driver doesn't wake up, they'll send a text message and email to their

family members about their situation. Hence, this utility goes beyond the problem of detecting drowsiness while driving. Eye extraction, face extraction with dlib.

Key words: Eye detection, face extraction, driver drowsiness.

I INTRODUCTION

The automobile industry in today's time has shown a steady rise across the globe. Consequently, the number of vehicles is increasing exponentially, which has further led to an increase in road accidents in each country. The road accidents have proved to be a menace that has majorly reduced the safety of the general public, let alone the driver. The World Health Organization identified sleepiness, alcoholism, and carelessness as the significant causes of road accidents in their Global Status Report on Road Safety. As a result, the fatalities and associated expenses that follow prove to be a severe threat to families across the world. The current drowsiness detection methods used are not widespread due to their high cost and less availability, thus making them unfeasible in the usual or non-luxury vehicles. Therefore there is a growing need for a smart and viable drowsiness detection system that the numerous automobiles in the industry can quickly adapt. The fields of machine learning and artificial intelligence have made numerous groundbreaking advances, which use different algorithms to train the model to be smart and autonomous.

Motivation

Drowsy driving is one of the major causes of deaths occurring in road accidents. The truck drivers who drive for continuous long hours (especially at night), bus drivers of long distance route or overnight buses are more susceptible to this problem. Driver drowsiness is an overcast nightmare to passengers in every country. Every year, a large number of injuries and deaths occur due to fatigue related road accidents. Hence,

detection of driver's fatigue and its indication is an active area of research due to its immense practical applicability. The basic drowsiness detection system has three blocks/modules; acquisition system, processing system and warning system. Here, the video of the driver's frontal face is captured in acquisition system and transferred to the processing block where it is processed online to detect drowsiness. If drowsiness is detected, a warning or alarm is send to the driver from the warning system

Objective

In this project by monitoring Visual Behavior of a driver with webcam and machine learning LBPH (Local binary Pattern Histogram) algorithm we are detecting Drowsiness in a driver. This application will use inbuilt webcam to read pictures of a driver and then using OPENCV LBPH algorithm extract facial features from the picture and then check whether driver in picture is blinking his eyes for consecutive 20 frames or yawning mouth then application will alert driver with Drowsiness messages. We are using LBPH pre-trained drowsiness model and then using Euclidean distance function we are continuously checking or predicting EYES and MOUTH distance closer to drowsiness, if distance is closer to drowsiness, then application will alert driver. In this project, I used Python and OpenCV to detect lane lines on the road. I developed a processing pipeline that works on a series of individual images, and applied the result to a video stream.

LITERATURE SURVEY

Intelligent Video-Based Drowsy Driver Detection System under Various Illuminations and Embedded Software Implementation

An intelligent video-based drowsy driver detection system, which is unaffected by various illuminations, is developed in this study. Even if a

driver wears glasses, the proposed system detects the drowsy conditions effectively. By a near-infrared-ray (NIR) camera, the proposed system is divided into two cascaded computational procedures: the driver eyes detection and the drowsy driver detection. The average open/closed eyes detection rates without/with glasses are 94% and 78%, respectively, and the accuracy of the drowsy status detection is up to 91%. By implementing on the FPGA-based embedded platform, the processing speed with the 640×480 format video is up to 16 frames per second (fps) after software optimizations

"**Driver Fatigue Detection based on Eye Tracking and Dynamic Template Matching"**

A vision-based real-time driver fatigue detection system is proposed for driving safely. The driver's face is located, from color images captured in a car, by using the characteristic of skin colors. Then, edge detection is used to locate the regions of eyes. In addition to being used as the dynamic templates for eye tracking in the next frame, the obtained eyes' images are also used for fatigue detection in order to generate some warning alarms for driving safety. The system is tested on a Pentium III 550 CPU with 128 MB RAM. The experiment results seem quite encouraging andpromising. The system can reach 20 frames per second for eye tracking, and the average correct rate for eye location and tracking can achieve 99.1% on four test videos. The correct rate for fatigue detection is l00%, but the average precision rate is 88.9% on the test videos.

III EXISTING SYSTEM

Traffic congestion is one of the major modern-day crisis inevery big city in the world. Previously different techniques had been proposed, such asinfra-red light sensor, induction loop etc. to acquire traffic datewhich had their fair share of demerits. In recent

years, imageprocessing has shown promising outcomes in acquiring realtime traffic information using CCTV footage installed alongthe traffic light. Different approaches have been proposed toglean traffic data. Some of them count total number of pixels[3], some of the work calculate number of vehicles [4-6].These methods have shown promising results in collectingtraffic data. However, calculating the number of vehicles maygive false results if the intravehicular spacing is very small(two vehicles close to each other may be counted as one) andit may not count rickshaw or auto-rickshaw as vehicles whichare the quotidian means of traffic especially in South-Asiancountries.

Drawbacks :

- Traffic congestion is one of the headack. Here using infra-red light sensor to detect traffic.
- acquire traffic date which had their fair share of demeritsimage processing has shown promising outcomes in acquiring real time traffic information using CCTV footage installed along the traffic light.

PROPOSED SYSTEM

In this project by monitoring Visual Behavior of a driver with webcam and machine learning LBPH (Local binary Pattern Histogram) algorithm we are detecting Drowsiness in a driver. This application will use inbuilt webcam to read pictures of a driver and then using OPENCV LBPH algorithm extract facial features from the picture and then check whether driver in picture is blinking his eyes for consecutive 20 frames or yawning mouth then application will alert driver with Drowsiness messages. We are using LBPH pre-trained drowsiness model and then using Euclidean distance function we are continuously checking or predicting EYES and MOUTH distance closer to drowsiness, if distance is closer to

drowsiness then application will alert driver.

METHODOLOGY:

Drowsy driving is one of the major causes of road accidents and death. Hence, detection of driver's fatigue and its indication is an active research area. Most of the conventional methods are either vehicle based, or behavioural based or physiological based. Few methods are intrusive and distract the driver, some require expensive sensors and data handling. Therefore, in this study, a low cost, real time driver's drowsiness detection system is developed with acceptable accuracy.

Home page.

In above screen click on 'Start Behaviour Monitoring Using Webcam' button to connect application with webcam, after clicking button will get below screen with webcam streaming. In above screen we can see web cam stream then application monitor all frames to see person eyes are open or not, if closed then will get below message

CONCLUSION

In this paper, a low cost, real time driver drowsiness monitoring system has been proposed based on visual

behavior and machine learning. Here, visual behavior features like eye aspect ratio, mouth opening ratio and nose length ratio are computed from the streaming video, captured by a webcam. An adaptive thresholding technique has been developed to detect driver drowsiness in real time. The developed system works accurately with the generated synthetic data. Subsequently, the feature values are stored and machine learning algorithms have been used for classification. Bayesian classifier, FLDA and LBPH have been explored here.

Future enhancement:

It has been observed that FLDA and LBPH outperform Bayesian classifier. The sensitivity of FLDA and LBPH is 0.896 and 0.956 respectively whereas the specificity is 1 for both. As FLDA and LBPH give better accuracy, work will be carried out to implement them in the developed system to do the classification (i.e., drowsiness detection) online.

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