A NEW ALERT SYSTEM FOR DETECTING DRIVER FATIGUE AND RINGING ALARM

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ABSTRACT

Drowsy riding is one of the foremost reasons of deaths taking place in avenue accidents. The truck drivers who force for non-stop lengthy hours (especially at night), bus drivers of long distance route or in a single day buses are extra inclined to this problem. Driver drowsiness is an overcast nightmare to passengers in each country. Every year, a massive wide variety of accidents and deaths manifest due to fatigue associated avenue accidents. Hence, detection of driver's fatigue and its indication is an lively location of lookup due to its gigantic sensible applicability. The fundamental drowsiness detection device has three blocks/modules; acquisition system, processing machine and warning system. Here, the video of the driver's frontal face is captured in acquisition gadget and transferred to the processing block the place it is processed on-line to observe drowsiness. If drowsiness is detected, a warning or alarm is ship to the driver from the warning system.

Keywords—Drowsy Riding, Acquisition, Fatigue,Warning System.

INTRODUCTION

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 sleepiness 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 sleepiness 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 sleepiness. If sleepiness is detected, a warning or alarm is send to the driver from the warning system.Generally, the methods to detect drowsy drivers are classified in three types; vehicle based, behavioural based and physiological based. In vehicle based method, a number of metrics like steering wheel movement, accelerator or brake pattern, vehicle speed, lateral acceleration, deviations from lane position etc. are monitored continuously. Detection of any abnormal change in these values is considered as driver sleepiness. This is a nonintrusive measurement as the sensors are not attached on the driver. In behavioural based method, the visual behavior of the driver i.e., eye blinking, eye closing, yawn, head bending etc. are analyzed to detect sleepiness. This is also nonintrusive measurement as simple camera is used to detect these features. In physiological based method, the physiological signals like Electrocardiogram (ECG), Electooculogram (EOG), Electroencephalogram (EEG), heartbeat, pulse rate etc. are monitored and from these metrics, sleepiness or fatigue level is detected. This is intrusive measurement as the sensors are attached on the driver which will distract the driver. Depending on the sensors used in the system, system cost as well as size will increase. However, inclusion of more parameters/features will increase the accuracy of the system to a certain extent. These factors motivate us to develop a low-cost, real time driver's sleepiness detection system with acceptable accuracy. Hence, we have proposed a webcam based system to detect driver's fatigue from the face image only using image processing and machine learning techniques to make the system low-cost as well as portable.

LITERATURE REVIEW

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.

"Monitoring Driver Fatigue using Facial Analysis Techniques"

In this paper, we describe a non-intrusive vision-based system for the detection of driver fatigue. The system uses a color video camera that points directly rewards the driver's face and monitors the driver's eyes in order to detect micro-sleeps (short periods of sleep). The system deals with skin-color information in order to search for the face in the input space. After segmenting the pixels with skin like color, we perform blob processing in order to determine the exact position of the face. We reduce the search space by analyzing the horizontal gradient map of the face, taking into account the knowledge that eye regions in the face present a great change in the horizontal intensity gradient. In order to find and track the location of the pupil, we use gray scale model matching. We also use the same pattern recognition technique to determine whether the eye is open or closed. If the eyes remain closed for an abnormal period of time (5-6 sec), the system draws the conclusion that the person is falling asleep and issues a warning signal.

"The Steps of Proposed Sleepiness Detection System Design based on Image Processing in Simulator Driving "

Sleepiness detection has many implications including reducing roads traffic accidents importance. Using image processing techniques is amongst the new and reliable methods in sleepy face. The present pilot study was done to investigate sleepiness and providing images of drivers' face,

employing virtual-reality driving simulator. In order to detecting level of sleepiness according to the signal, information related to 25 drivers was recorded with imaging rate of 10 fps. Moreover, on average 3000 frames was analysed for each driver. The frames were investigated by transforming in grey scale space and based on the Cascade and Viola & Jones techniques and the images characteristics were extracted using Binary and Histogram methods. The MPL neural network was applied for analysing data.70% of information related to each driver were inserted to the network of which 15% for test and 15% for validation. In the last stage the accuracy of 93% of the outputs were evaluated. The intelligent detection and usage of various criteria in long-term time frame are of the advantages of the present study, comparing to other researches. This is helpful in early detection of sleepiness and prevents the irrecoverable losses by alarming.

EXISTING SYSTEM

Now a days maximum members are using vechile(car, lorry,bus).according to survey 10 to 15% are accidents are accruing because of the driver was in sleepy mode.No software having to give alert to the driver

Dis-advantages :-

More Accidents are accruing

Unable to give alert while driver was sleepy**.**

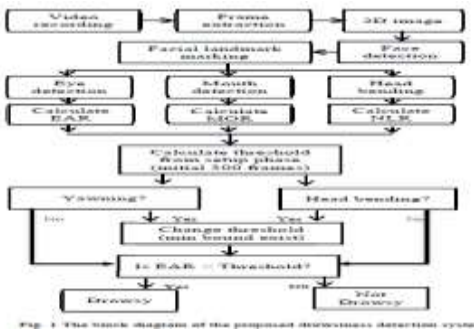
PROPOSED SYSTEM:

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. In the developed system, a webcam records the video and driver's face is detected in each frame employing image processing techniques. Facial landmarks on the detected face are pointed and subsequently the eye aspect ratio, mouth opening ratio and nose length ratio are computed and depending on their values, drowsiness is detected based on developed adaptive thresholding.

Advantages :-

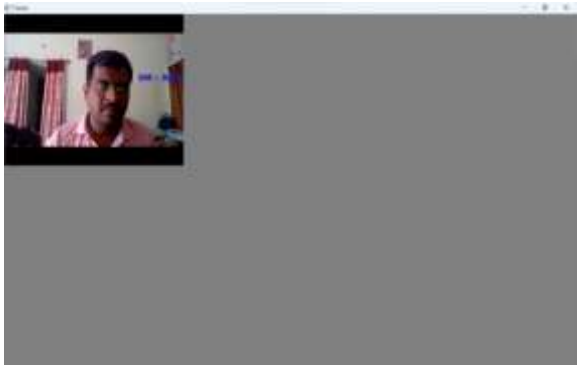
- Provide alert to the driver.
- Decrease the accidents.

SYSTEM ARCHITECTURE

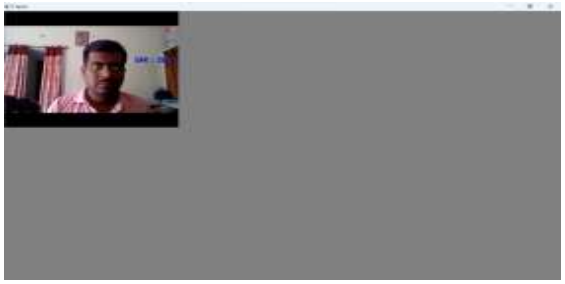


RESULT

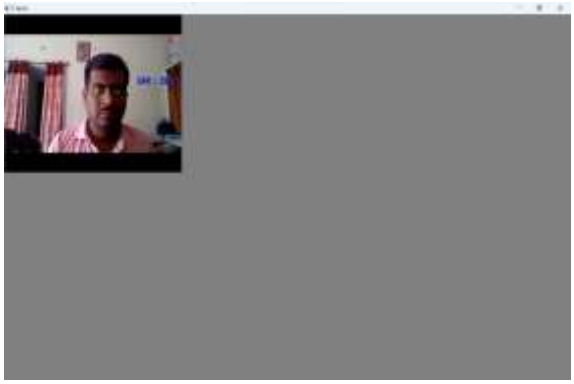
To run this project double click on 'run.bat' file to get below screen



In above screen click on 'Start Behaviour Monitoring Using Webcam' connect application with webcam, 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 alarm sound was going to start



Continuous eyes closing starts alarm sounds continuously

CONCLUSION

In this paper, a low cost, real time driver sleepiness 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 sleepiness 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 SVM have been explored here. It has been observed that FLDA and SVM outperform Bayesian classifier. The sensitivity of FLDA and SVM is 0.896 and 0.956 respectively whereas the specificity is 1 for both. As FLDA and SVM give better accuracy, work will be carried out to implement them in the developed system to do the classification (i.e., sleepiness detection) online. Also, the system will be implemented in hardware to make it portable for car system and pilot study on drivers will be carried out to validate the developed system.

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