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AN AUTOMATIC DRIVER DROWSINESS ALERT SYSTEM USING MATLAB

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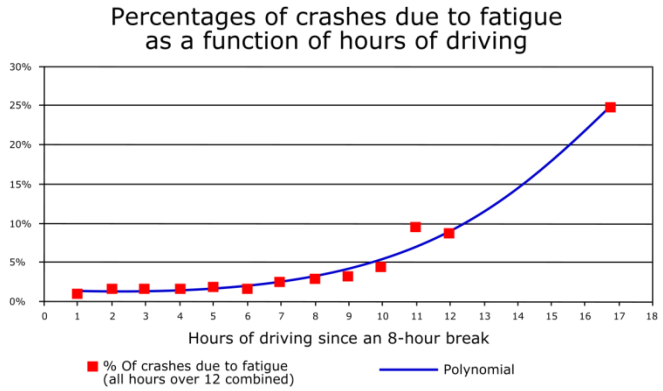
Abstract - *In the modern era, usage of cars has been increased rapidly which in turn increased the no of road accidents. It is necessary to take precautions to avoid accidents. Being inattentive and carelessness are the main reasons for these accidents. Knowing the danger beforehand and warning the driver may save no of lives. This can be done using MATLAB software through image processing. Web camera placed in front of the driver captures images of the driver. Face detection and eye detection functions are processed using the vision cascade samples and viola-jones algorithms respectively. Finally, state of the driver's condition is detected and the respective outputs are considered. In the limited span of time , the system passes the condition of the driver and sends the message to alert the driver.*

Key Words **viola-Jones algorithm, face detection, eye detection, drowsiness.**

1 .INTRODUCTION

In the recent surveys of road accidents, it is estimated that the driver fatigue is the major cause and the analysis says that there is annual death count of 1500 and around 80000 injuries due to these road crashes.



Driver fatigue is stated as the significant factor in large number of vehicle accidents. Methods need to be developed for counteracting the affect of drowsiness present on the roads. In different regions of the world, development of technologies for detecting drowsiness has become challenging in the field of accident avoidance systems. Various experiments are implemented for the drowsiness detection of driver. Some of them are monitoring of roads, physiological techniques which require contact of electrode with the body etc.

The main objective of this theory is to develop a system to detect the drivers drowsiness. The system is designed in such a way that it will accurately monitor the state of driver's eyes in real time. This paper is described about designing of the system using various detection functions. These detection functions include vision cascade samples, face detection, eye detection and drowsiness detection.

2. PROPOSED METHODOLOGY

Detection of drivers condition is described in this methodology. This system detects and responds quickly and accurately. All the internal functioning of the system is done in MATLAB software using image processing. Various algorithms are used at distinct functions of the processing.

The description of the proposed methodology using detection functions is as shown in the below fig. c

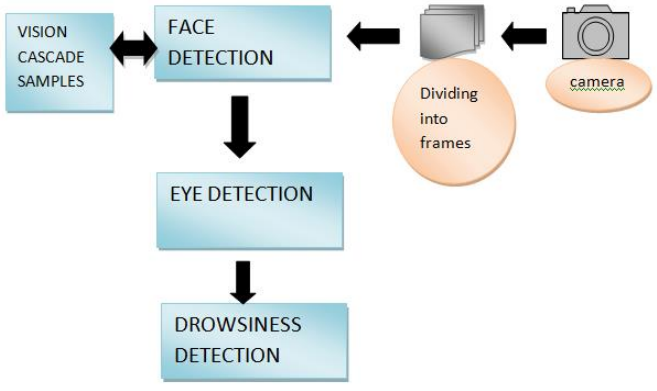


Fig. Block diagram of methodology

Web camera is placed in front of the drivers face which continuously takes live video of drivers condition. Video acquisition is involved here which after getting the live video as input converts it into images or frames and send to the processing.

At the face detection stage in each frame, face of the driver is detected and this detection is attained by using the vision cascade samples. Only one frame is taken at a time. Here in the frame face is taken as region of interest.

Of all the detection functions, eye detection has the key role in this methodology and in this paper it is done by using the Viola Jones algorithm. Eyes of the driver from each frame are detected following the face detection and eyes are selected as region of interest here in the face.

The state of eye ball are noticed in this process whether they are closed or open in the consecutive frames. Blink rate is also considered along with the eyes.

If the eyes are observed as closed continuously for two seconds i.e. for continuous frames, it is considered as the driver is in drowsiness state and a warning message is sent. In other case i.e. not continuous, it is declared as blink. Processing a static image and live feed are the steps to be considered.

FLOWCHART

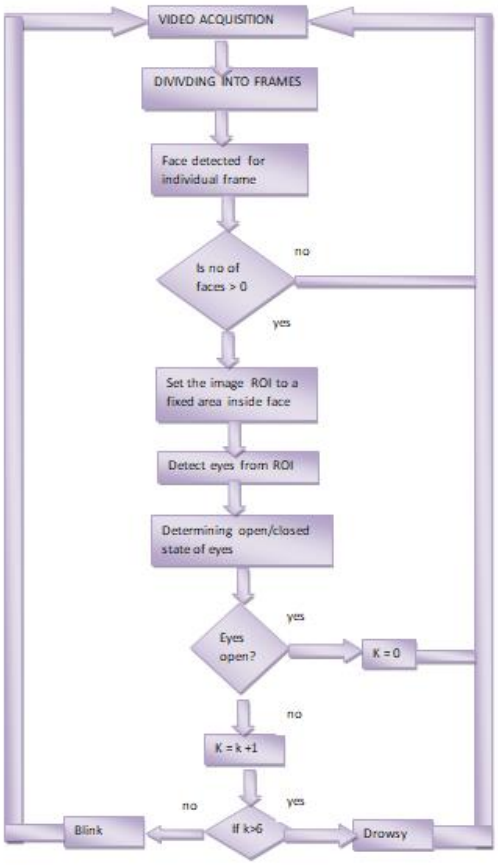


Fig. flowchart describing the process

Processing the image at the corners can be avoided since the camera is focused on the automobile driver thus reducing a significant amount of processing required. The region of interest is now face. To detect the eyes, we mark a region of interest within the face region which further helps in achieving the primary goal of the proposed system. Once the eyes have been detected, the next step is to determine whether the eyes are in open/closed state, which is achieved by extracting and examining the pixel values from the eye region.

RESULT

The symptoms of the driver fatigue can be detected early enough to avoid a car accident by monitoring then eyes. Observation of eye movements and blink patterns in a sequence of images of a face are involved in detection of fatigue.

The proposed methodology is processed in the MATLAB version of 2017a. MATLAB has the capability of processing 4-5 frames per second.

Using the detection functions and algorithms code is written in the MATLAB software. After the code is run, the final outputs are displayed as shown in the below figures.

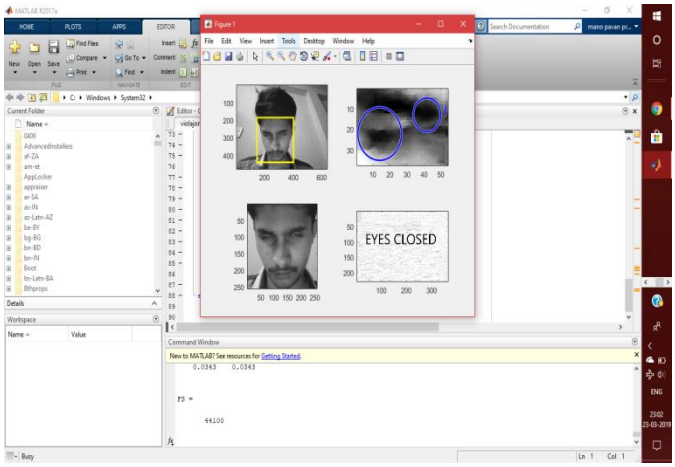


Fig. Output showing that the driver's eyes are closed

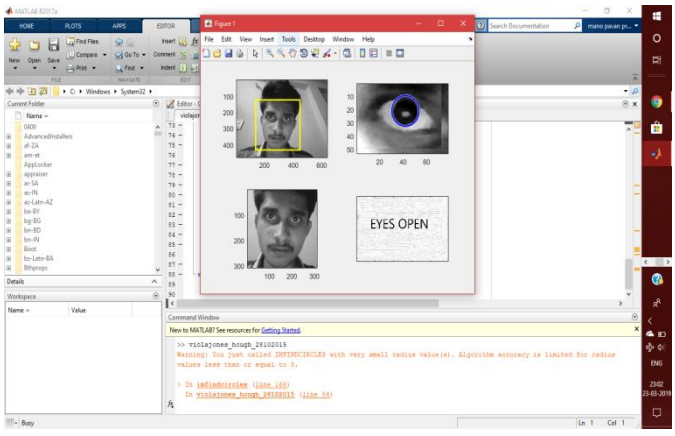


Fig. output showing that the driver's eyes are open

3. CONCLUSIONS

Using MATLAB software and Viola Jones algorithm detection of driver's drowsiness system is designed successfully. This system gives the quick and accurate results. This can also be implemented using hardware in the future

REFERENCES

[1] Report on "Drowsiness Detection System Using MATLAB" by Divya Chandan in International Journal of Scientific & Engineering Research Volume 9, Issue 3, March-2018.

[2] Report on "DROWSINESS DETECTION SYSTEM USING MATLAB" by Ms. Shalini Kashyap, Mr. V.K Sharma in International Journal of Advance Research Science and Engineering

[3] K. Dwivedi, K. Biswaranjan, A. Sethi, "Drowsy driver detection using representation learning",IEEE, International Advance Computing Conference, pp.995-999, Feb-2014

[4] P. Viola and M. J. Jones, Robust real-time face detection, International Journal of Computer Vision, 57 (2004), pp. 137{154.

[5] Neeta Parmar Instructor: Peter Hiscocks, "Drowsy Driver Detection System" Department of Electrical and Computer Engineering", presented at Ryerson University © 2002.

[6] Hyungseob Han, Uipil Chong, "Detection of drowsniess with eyes-open using EEG", ISSN, vol.9, no. 1, pp.2326-3636, 2014.

[7] Ruian Liu,et.a;, "Design of face detection and tracking system," Image and Signal Processing (CISP), 2010 3rd International Congress on , vol.4, no., pp.1840,1844, 16-18 Oct. 2010.