International Journal of Recent Advances in Multidisciplinary Topics
Volume 2, Issue 3, March 2021
https://www.ijramt.com | ISSN (Online): 2582-7839

Driver Drowsiness Detection Process System by Using OpenCV and Python

M. Priyadharshini[1], M. Rajkumar[2*], G. Renugadevi[3], K. Sangeetha[4]
[1,2,3,4]*Department of Computer Science and Engineering, SNS College of Technology, Coimbatore, India*

***Abstract*: Now-a-days, more and more professions require long-term concentration. Drivers must keep a close eye on the road, so they can react to sudden events immediately. Driver fatigue often becomes a direct cause of many traffic accidents. Therefore, there is a need to develop the systems that will detect and notify a driver of her/him bad psychophysical condition, which could significantly reduce the number of fatigue-related car accidents. However, the development of such systems encounters many difficulties related to fast and proper recognition of a driver's fatigue symptoms. One of the technical possibilities to implement driver drowsiness detection systems is to use the vision-based approach. This article presents the currently used driver drowsiness detection systems. Here we are detecting the driver drowsiness by estimating vision system of him.**

***Keywords*: Drivers level of fatigue, Detect drowsiness.**

1. Introduction

Driver drowsiness detection is a car safety technology which prevents accidents when the driver is getting drowsy. Various studies have suggested that around 20% of all road accidents are fatigue-related, up to 50% on certain roads. Driver fatigue is a significant factor in a large number of vehicle accidents. Recent statistics estimate that annually 1,200 deaths and 76,000 injuries can be attributed to fatigue related crashes. The development of technologies for detecting or preventing drowsiness at the wheel is a major challenge in the field of accident avoidance systems. Because of the hazard that drowsiness presents on the road, methods need to be developed for counteracting its affects. Driver inattention might be the result of a lack of alertness when driving due to driver drowsiness and distraction. Driver distraction occurs when an object or event draws a person's attention away from the driving task. Unlike driver distraction, driver drowsiness involves no triggering event but, instead, is characterized by a progressive withdrawal of attention from the road and traffic demands. Both driver drowsiness and distraction, however, might have the same effects, i.e., decreased driving performance, longer reaction time, and an increased risk of crash involvement. shows the block diagram of overall system. Based on Acquisition of video from the camera that is in front of driver perform real-time processing of an incoming video stream in order to infer the driver's level of fatigue if the drowsiness is Estimated then it will give the alert by sensing the eyes. Gather a data set of face and eye. These should be stored in one or more directories indexed by a text file. A lot of high quality data is required for the classifier to work well. The application creates samples () is used to build a vector output file. This file we can repeat the training procedure. It extracts the positive samples from images before normalizing and resizing to specified width and height. The Viola Jones cascade decides whether or not the object in an image is similar to the training set. Any image that doesn't contain the object of interest can be turned into negative sample. So in order to learn any object it is required to take a sample of negative background image. All these negative images are put in one file and then it's indexed.

2. Literature Survey

1. Several researches studied different methods and features in order to detect drowsiness. We present a generalized framework for drowsiness detection based on sensors on the steering-wheel. An important aspect in these methods are the frequency they used to log data.
2. According to the National Highway Traffic Safety Administration, between 2011 and 2015 approximately 30,000 accidents per year have been due to drowsy driving resulting in approximately 800 fatalities.
3. X. Wang and C. Xu, the high correspondence between KSS 7 and drowsiness level 3 is consistent with previous results on driving performance that show steep degradation starting and drowsiness level.
4. M. Patel, reflect moderate or deep drowsiness, as indicated. Physiological measures show very wide individual differences and were therefore regarded as ineffective for the proposed method, which did not train on individual drivers.
5. H. Drucker, kernel based-support vector regression which is a modified support vector machine for nonlinear regression, was used in this study.
6. E. Rogado, among these methods, the techniques that are the best based on accuracy are the ones based on human physiological phenomena.
7. H. Singh, the technique based on eye closure is well suited for real world driving conditions, since it can be non-

*Corresponding author: mrajnkl2000@gmail.com

intrusive by using cameras to detect the open/closed state of the eyes.

3. Proposed System

This method has many new contributions and advantages compared to the previous methodologies. There are several different algorithms and methods for eye tracking, and monitoring. Most of them in some way relate to features of the eye (typically reflections from the eye) within a video image of the driver. The original aim of this project was to use the retinal reflection as a means to finding the eyes on the face, and then using the absence of this reflection as a way of detecting when the eyes are closed. Applying this algorithm on consecutive video frames may aid in the calculation of eye closure period. Eye closure period for drowsy drivers are longer than normal blinking. It is also very little longer time could result in severe crash. So we will warn the driver as soon as closed eye is detected.

First we input the facial image using a webcam. Preprocessing was first performed by binarizing the image. The top and sides of the face were detected to narrow down the area where the eyes exist. Using the sides of the face, the center of the face was found which will be used as a reference when computing the left and right eyes. Moving down from the top of the face, horizontal averages of the face area were calculated. Large changes in the averages were used to define the eye area. There was little change in the horizontal average when the eyes were closed which was used to detect a blink.

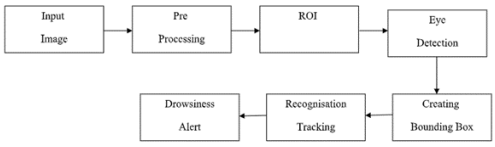

Fig. 1. Proposed system

4. Conclusion

The driver abnormality monitoring system developed is capable of detecting drowsiness, drunken and reckless behavior of driver in a short time. The Drowsiness Detection System developed based on eye closure of the driver can differentiate normal eye blink and drowsiness and detect the drowsiness while driving. The proposed system can prevent the accidents due to the sleepiness while driving. The system works well even in case of drivers wearing spectacles and even under low light conditions if the camera delivers better output. Information about the head and eyes position is obtained through various self-developed image processing algorithms. During the monitoring, the system is able to decide if the eyes are opened or closed. When the eyes have been closed for too long, a warning signal is issued. Processing judges the driver's alertness level on the basis of continuous eye closures.

References

[1] Zuojin Li, Shengbo Eben Li, Renjie Li, Bo Cheng, and Jinliang Shi. "Online detection of driver fatigue using steering wheel angles for real driving conditions".

[2] National Highway Traffic Safety Administration. (Oct. 2017). Traffic Safety Facts Crash Stats: Drowsy Driving, 2015.

[3] X. Wang and C. Xu, "Driver drowsiness detection based on non-intrusive metrics considering individual specifics."

[4] M. Patel, S. K. L. Lal, D. Kavanagh, and P. Rossiter, "Applying neural network analysis on heart rate variability data to assess driver fatigue," Expert Syst. Appl.

[5] H. Drucker, C. J. C. Burges, L. Kaufman, A. Smola, and V. Vapnik, "Support vector regression machines," in Proc. NIPS, 1996.
E. Rogado, J. L. García, R. Barea, L. M. Bergasa, López, "Driver Fatigue. Detection System", *International. Conference on Robotics and Biometics*, 2013.

[6] H. Singh, J. S. Bhatia, and J. Kaur, "Eye tracking based driver fatigue monitoring and warning system", *in Proc.* 2014.