IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

Real- Time Driver-Drowsiness Detection System Using Facial Feature

Prof.Naresh Thoutam, Maurvika Sakhare, Prasad Jagtap, Saurabh Jagtap, Aniruddha Lingayat.

Department of Computer Engineering, Sandip Institute of Technology and Research Center, Nashik (422213),India

Abstract:

The face, an important part of the body, conveys a lot of information. When a driver is in a state of fatigue, the facial expressions, e.g., the frequency of blinking and yawning, are different from those in the normal state. In this paper, we propose a system called DriCare, which detects the drivers' fatigue status, such as yawning, blinking, and duration of eye closure, using video images, without equipping their bodies with devices. Owing to the shortcomings of previous algorithms, we introduce a new face-tracking algorithm to improve the tracking accuracy. Further, we designed a new detection method for facial regions based on 68 key points. Then we use these facial regions to evaluate the drivers' state. By combining the features of the eyes and mouth, DriCare can alert the driver using a fatigue warning. The experimental results showed that DriCare achieved around 92% accuracy.

I. INTRODUCTION

Fatigue not only impacts the alertness and reaction time of the driver however it ad-additionally will increase the probabilities of automotive accidents. Ministry of Road Transport and Highways(MoRTH) analysis information indicates that driving in fatigue condition could be a contributive issue to 32- 33 per cent of automotive crashes, which driving whereas drowsy leads to a 5 to 6 times higher near-crash/ crash risk relative to alert drivers. This high accident rate is because asleep drivers fail to require corrective actions before a collision. A vital irony in driver‟s fatigue is that the motive force could also be too tired to appreciate his level of temporary state. This necessary drawback is commonly unheeded by the motive force.Hence, the employment of aiding such a framework is vital to fore-stall accidents or mishap. This Framework ought to then signal the motive force within the case of a temporary state or basic cognitive process. There are intensive analysis works done to discover somnolence of drivers, supported the preceding gestures of the body (i.e. eye motion detection and yawning detection), However, our proposition is additional sturdy bogus detections and is additionally more sensible to implement. In our technique, the driver‟s face is endlessly recorded employing a camera that's put in underneath the front mirror. To discover the yawn, the primary step is to discover and track the face exploitation the series of frame shots taken by the camera. we can then discover the situation of the eyes and also the mouth within the detected face. It ought to be noted that even if we tend to don‟t method the attention gestures for yawning detection, the situation of the eyes within the face is employed as the simplest technique to authenticate the position of the divided face. This makes the face distribution procedure additional sturdy to false detections. The mouth geometrical options are then wont to discover the yawn.the yawn lasts for about 5 sec are system possibly recognises a yawn for about 10 sec step time period. The geo shape for the same will give us a training data give an improved output for better comparison would better further the accuracy and develop the future enhancement to the system.The system can alert the motive force of his fatigue and also the improper driving state of affairs just in case of yawning detection .

II. LITERATURE REVIEW:

Camera based Drowsiness Reference for Driver State Classification under Real Driving Conditions'. They proposed that measures of the driver's eyes are capable to detect drowsiness under simulator or experiment conditions.

'Visual Analysis of Eye State and Head Pose for Driver Alertness Monitoring'. They presented visual analysis of eye state and head pose (HP) for continuous monitoring of alertness of a vehicle driver.

'Analysis of Bus Tracking System Using Gps on Smart Phones'. The bus tracking system plays a vital role in current technology due to its various applications. It provides current location of bus on google maps to the remote user.

'Car drivers for the assessment of mental workload, fatigue and drowsiness'. Driving tasks are vulnerable to the effects of sleep deprivation and mental fatigue, diminishing driver's ability to respond effectively to unusual or emergent situations.

'Real-Time Driver-Drowsiness Detection System Using Facial Features'. The face, an important part of the body, conveys a lot of information. When a driver is in a state of fatigue, the facial expressions, are different from those in the normal state

'Drive Care: A Real-Time Vision Based Driver Drowsiness Detection Using Multiple Convolutional Neural Networks With Kernelized Correlation Filters (MCNN-KCF)'. Driver Drowsiness is one of the most significant safety issues facing the road transport industry today. By combining the features extracted by the eyes and mouth, Drive Care can alert the driver using a drowsiness warning tone.

III.PROBLEM STATEMENT:

We are developing an android application to work on Real-Time Driver-Drowsiness and accident detection with facial feature .

IV. Objectives:

The main objective is to develop a system that is accurate to detect a driver's drowsiness based on eyelid movement and yawning and is reliable to give appropriate voice alerts [6] in real-time. The other objectives include designing a system that detects drowsiness of drivers by monitoring the eyes of the driver regularly, especially the retina. The system should give an alert to the driver when the driver yawns frequently or when the driver's eyes remain closed for a few seconds. The system works even when a driver is wearing spectacles. The system is not affected by bad lighting conditions.

V. RESEARCH METHODOLOGY

The methodology used to design the Drowsiness Detection System is an iterative research and analysis cycle. The research stage generates concepts and the analysis stage selects concepts, analyze requirements and constraints. The cycle is then repeated to generate more refined concepts and these concepts are further analyzed.

Requirements

Reliability: The solution should reliably detect drowsiness so that it can serve its purpose as a system for promoting driver safety.

Real-time response: The operation of a vehicle can involve relatively high speeds, a system that cannot detect drowsiness and warn that driver promptly can lead to serious consequences.

Unobtrusive: It is very important that the solution is as transparent to the driver as possible.

Economical: Existing solutions to this problem are available today but the effective ones are usually too expensive for widespread implementation.

Flexible: To be effective, the solution should be designed so as to accommodate for all types of users, in terms of physical attributes.

VI. OUTCOME

The drowsiness detection and correction system developed is capable of detecting drowsiness in a rapid manner. The system which can differentiate normal eye blink and drowsiness which can prevent the driver from entering the state of sleepiness while driving. The system works well even in case of drivers wearing spectacles and under low light conditions also. During the monitoring, the system is able to decide if the eyes are opened or closed

VII. APPLICATIONS

providing real-time drowsiness feedback to the driver,
providing performance feedback to a fatigue management program,
providing regulatory compliance information to enforcement officials.

VIII. DESIGN OF PROPOSED SYSTEM

This project is designed by dividing it into the following three phases:

1.Ul design:

In this phase, the UI or the user interface of the project is developed. .

2. Database design:

Database is important in every project since it is responsible for storing of data and user credentials.

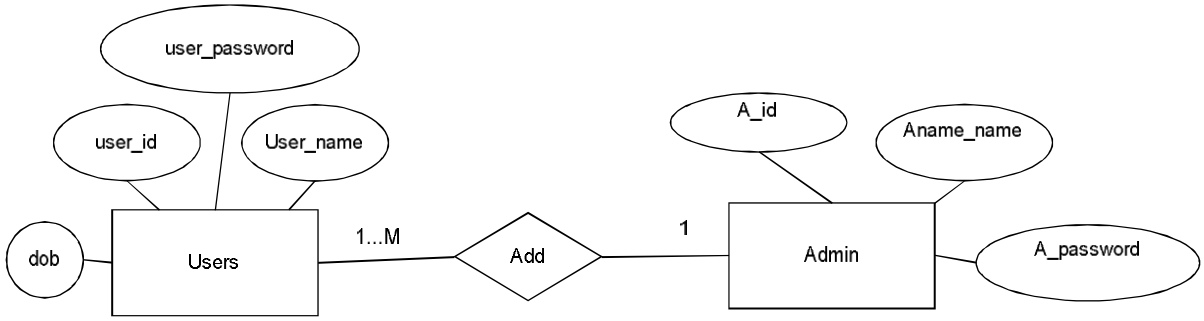
3. System design:

In this stage, hardware and software requirement to design the system is decided. It uses above mentioned hardware and software requirements. We design the of Admin and user module. Design the according to functionality of each module.

A Entity Relationship Diagrams

An **entity–relationship model** (**ER model** for short) describes interrelated things of interest in a specific domain of knowledge. A basic ER model is composed of entity types (which classify the things of interest)
and specifies relationships that can exist between instances of those entity types.

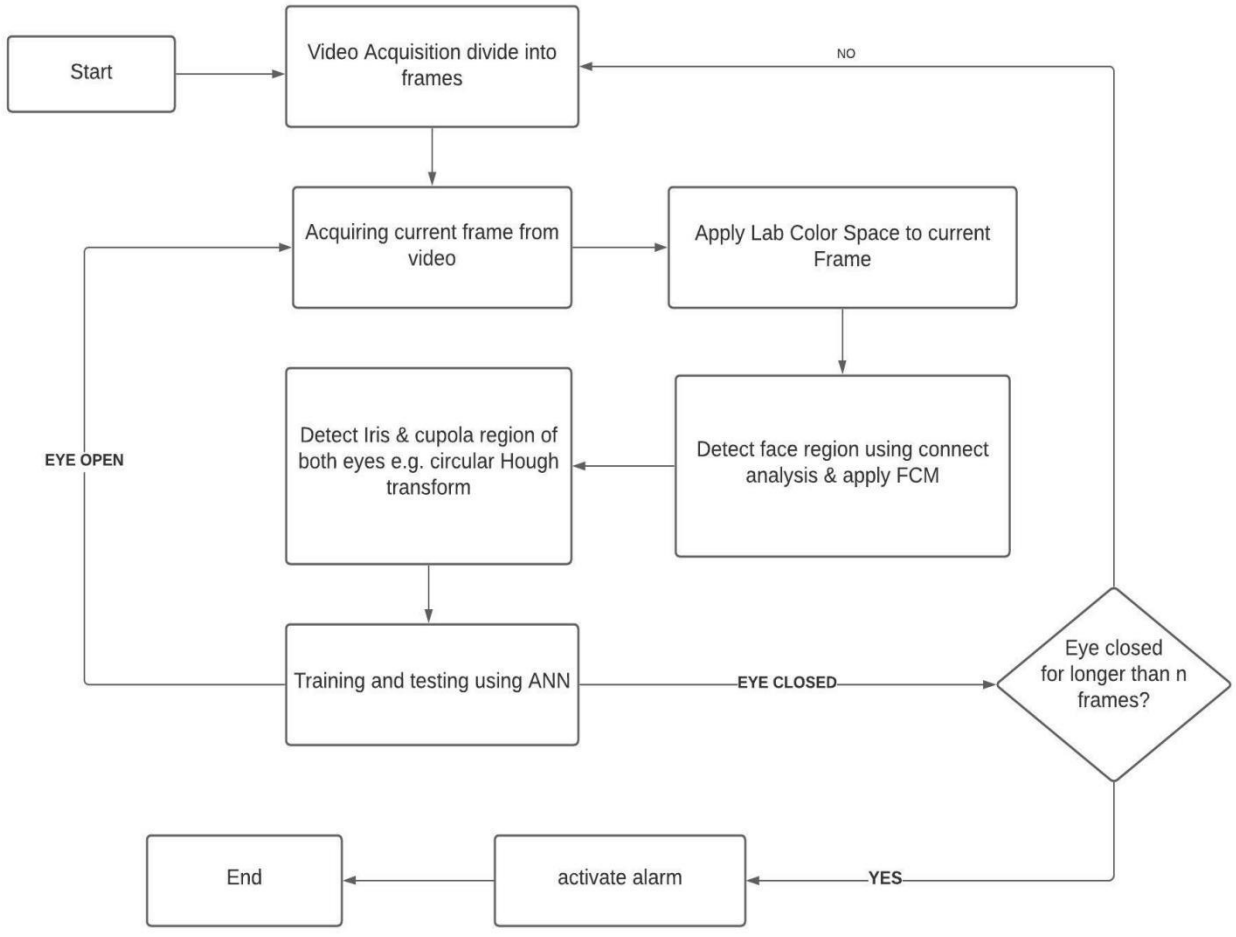
In software engineering, an ER model is commonly formed to represent things that a business needs to remember in order to perform business processes. Consequently, the ER model becomes an abstract data model, that defines a data or information structure which can be implemented in a database, typically a relational database.



IX. ARCHITECTURAL DESIGN

B Sequence

A Sequence diagram is an interaction diagram that shows how processes operate with one another and in what order. It is a construct of a Message Sequence Chart. A sequence diagram shows object interactions arranged in time sequence. It depicts the objects and classes involved in the scenario and the sequence of messages exchanged between the objects needed to carry out the functionality of the scenario. Sequence diagrams are typically associated with use case realizations in the Logical View of the system under development. Sequence diagrams are sometimes called event diagrams or event scenarios.



X. CONCLUSION:

In the behavioral approaches various techniques like machine learning, image processing were all used to solve drowsy problem, however despite their success, suffers false alarm, poor dataset design, unreliability, among others.

There are many types of DL algorithms but CNN was choose due to its operating success in processing large image or video based data, when compared to other DL algorithms. We define the facial regions of detection based on facial key points. Moreover, we introduce a new evaluation method for drowsiness based on the states of the eyes and mouth. Therefore, DriCare is almost a real-time system as it has a high operation speed.

References

[1] International Organization of Motor Vehicle Manufacturers. (2018). Provisional Registrations or Sales of New Vehicles. [Online]. Available: http://www.oica.net/wp-content/uploads/

[2] Wards Intelligence. (2018). World Vehicles in Operation by Country, 2013– 2017. [Online]. Available: http://subscribers.wardsintelligence.com/databrowse-world

[3] National Highway Traffic Safety Administration. (2018). Traffic Safety Facts 2016. [Online]. Available: https://crashstats.nhtsa.dot.gov

[4] G. Borghini, L. Astolfi, G. Vecchiato, D. Mattia, and F. Babiloni, ‘‘Measuring neurophysiological signals in aircraft pilots and car drivers for the assessment of mental workload, fatigue and drowsiness,’’ Neurosci. Biobehav. Rev., vol. 44, pp. 58–75, Jul. 2014.

[5] Attention Technologies. (1999). S.a.m.g-3-Steering Attention Monitor. [Online]. Available: https://www.zzzzalert.com

[6] Smart Eye. (2018). Smarteye. [Online]. Available:https://smarteye.se/

[7] J. F. Henriques, R. Caseiro, P. Martins, and J. Batista, ‘‘High-speed tracking with kernelized correlation filters,’’ IEEE Trans. Pattern Anal. Mach. Intell., vol. 37, no. 3, pp. 583–596, Mar. 2015.

[8] P. F. Felzenszwalb, R. B. Girshick, D. McAllester, and D. Ramanan, ‘‘Object detection with discriminatively trained part-based models,’’ IEEE Trans. Pattern Anal. Mach. Intell., vol. 32, no. 9, pp. 1627–1645, Sep. 2010.

[9] Y. Sun, X. Wang, and X. Tang, ‘‘Deep convolutional network cascade for facial point detection,’’ in Proc. IEEE Conf. Comput. Vis. Pattern Recognit., Jun. 2013, pp. 3476–3483.

[10] S. Ren, X. Cao, Y. Wei, and J. Sun, ‘‘Face alignment at 3000 FPS via regressing local binary features,’’ in Proc. IEEE Conf. Comput. Vis. Pattern Recognit., Jun. 2014, pp. 1685–1692.

[11] E. Zhou, H. Fan, Z. Cao, Y. Jiang, and Q. Yin, ‘‘Extensive facial landmark localization with coarse-to-fine convolutional network cascade,’’ in Proc. IEEE Int. Conf. Comput. Vis. Workshops, Dec. 2013, pp. 386–391.

[12] W. Walter, ‘‘Overview of research on driver drowsiness definition and driver drowsiness detection,’’ in Proc. Int. Tech. Conf. Enhanced Saf. Vehicles, 1995, pp. 462–468 R. Grace, V. E. Byrne, D. M. Bierman, J.-M. Legrand, D. Gricourt, B. K. Davi, J. J. Staszewski, and B. Carnahan, ‘‘A drowsy driver detection system for heavy vehicles,’’ in Proc. 17th AIAA/IEEE/SAE. Digit. Avionics Syst. Conf. (DASC), vol. 2, Oct. 1998, pp. I36-1–I36-8.

[13] L. Li, Y. Chen, and Z. Li, ‘‘Yawning detection for monitoring driver fatigue based on two cameras,’’ in Proc. 12th Int. IEEE Conf. Intell. Transp. Syst., Oct. 2009, pp. 1–6.

[14] S. Abtahi, B. Hariri, and S. Shirmohammadi, ‘‘Driver drowsiness monitoring based on yawning detection,’’ in Proc. IEEE Int. Instrum. Meas. Technol. Conf., May 2011, pp. 1–4. [16] X. Fan, B. Yin, and Y. Sun, ‘‘Yawning detection for monitoring driver fatigue,’’ in Proc. Int. Conf. Mach. Learn. Cybern., vol. 2, Aug. 2007, pp. 664–668.