International Journal of Future Generation Communication and Networking
Vol. 13, No. 3, (2020), pp. 3222–3227

Faulty Drowsy Driving Detection System

Dhanraj S. Jadhav[1], Prachi Lotake[2], Renuka Koli[3], Nutan Budhner[4], Gauri Mohite[5], Onkar Bhope[6]

[1]Assistant Professor, Department of Computer Engineering Jspm's RSCOE, Tathawade, Pune, India

[23456]Department of Computer Engineering Jspm's RSCOE, Tathawade, Pune, India

[1]dhanraj.acem12@gmail.com, [2]prachianillotake@gmail.com, [3]renukakoli1997@gmail.com, [4]budner122@gmail.com, [5]mohiteguari10@gmail.com, [6]onkar.bhope@gmail.com

Abstract

Drowsy Driver Detection System has been developed, employing a Non-Intrusive machine vision based ideas. The system uses a touch monochrome security camera that points directly towards the driver's face and monitors the driver's eyes so on observe fatigue. In such a case once fatigue is detected, an alert is issued to alert the driving force. This report describes the thanks to realize the eyes, and conjointly the thanks to verify if the eyes area unit open or closed. The algorithm developed is exclusive to any presently revealed papers that was a primary objective of the project. The system deals with victimization data obtained for the binary version of the image to look out the edges of the face that narrows the realm of wherever the eyes could exist. Once the face space is found, the eyes area unit found by computing the horizontal averages within the space. Taking into consideration the info that eye regions within the face gift nice intensity changes, the eyes area unit placed by finding the various intensity changes within the face. Once the eyes area unit placed, measure the distances between the intensity changes within the attention space verify whether or not the eyes square measure open or closed. an oversized distance corresponds to eye closure. If the eyes square measure found closed for five consecutive frames, the system attracts the conclusion that the motive force is falling asleep and problems a alert. The system is additionally able to observe once the eyes cannot be found, and works below affordable lighting conditions. Here we also track user live location if any emergency arrives then system automatically send location to nearest hospital, police station as well its family members. After that we also detect user are drunk or not by using alcohol detecting sensors. Here we can say that our system is more efficient that existing systems.

Keywords: *Detect Drowsy, Eye Detection, Eye Tracking, Alcohol Detection, Location Tracking*

1. Introduction

Driver fatigue could be a important consider an outsized variety of car accidents. Recent statistics estimate that annually one, 200 deaths and seventy six, injuries are going to be attributed to fatigue connected crashes. The event of technologies for police investigation or preventing state at the wheel might be a serious challenge within the sector of accident shunning systems. As a results of the hazard that state presents on the road, ways need to be compelled to be developed for counteracting its affects. The aim of this project is to develop a epitome state detection system. the most focus are getting to be placed on arising with a system which will accurately monitor the open or closed state of the driver's eyes in period of time . By watching the eyes, it's believed that the symptoms of driver fatigue are going to be detected

ISSN: 2233-7857 IJFGCN

early enough to avoid a automobile accident. Detection of fatigue involves a sequence of images of a face, and also the observation of eye movements and blink patterns. The analysis of face pictures might be a widespread analysis space with applications Like face recognition, virtual tools, and human identification security systems. This project is targeted on the localization of the eyes, that involves viewing the entire image of the face, and deciding the position of the eyes by a self developed image-processing algorithm . Once the position of the eyes is found, the system is meant to ascertain whether or not the eyes are opened or closed, and find fatigue.

2. Literature Survey

2.1. Drowsy Driver Detection System Using Eye Blink Patterns
Author: Taner Danisman, Ian Marius Bilasco, Chabane Djeraba Nacim Ihaddadene

Description: This paper presents an automatic drowsy driver monitoring and accident prevention system that's supported monitoring the changes within the blink duration. This scheme detects visual changes in eye locations using the horizontal symmetry feature of the eyes. Our new method detects eye blinks via a typical webcam in real-time at 110fps for a 320×240 resolution. Experimental results in the JZU eye-blink database showed that the proposed system detects eye blinks with a 94% accuracy with a tenth false positive rate.

2.2. Driver Eye Behaviour Based Drowsiness Detection System.
Author: Javed Ahmed, Jian-Ping Li, Saeed Ahmed Kran, Riaz, Ahmed Shaikr

Description: A non-intrusive computer vision-based ideas are utilized for the event of a Drowsy Driver Detection System. All cameras has been employed by a system that focuses straight towards the face of the driving force and checks the drivers' eyes with a selected end goal to acknowledge fatigue. A wake-up call is issued to caution the driving force, in such a situation when fatigue is recognized. This paper illustrates the method of locating the eyes of the driving force, and to make a decision whether the eyes of the driving force are open or close. The system manages to utilize data gained for the image which is in binary form to locate the face edges, which gets the situation where the eyes of an individual may exist. If the eyes of the driving force are found close for five successive frames, the proposed system assures that the driving force is nodding off and a sign of warning has been issued. The framework is additionally capable to acknowledge in such a situation when the eyes cannot be discovered and add sensible lighting circumstances. The result demonstrates that eye- tracking drowsiness functions admirably for a couple of drivers the length of the squint acknowledgment works appropriately. The camera-based drowsiness measures give an appreciated contribution.

2.3. Driver Drowsiness Detection Based on Novel Eye Openness Recognition Method and Unsupervised Feature Learning.
Author: Wei Han, Yan Yang, Guang-Bin Huang, Olga Sourina, Felix Klanner, and Cornelia Denk

Description: In this paper, the authors proposed a driver drowsiness detection method that only eyelid movement information was required. The proposed method consists of two major parts. for locating correct eye status detection, a vision-based eye status recognition function wont to a regression model that directly gave a degree of eye status from a low-resolution eye image without complex modeling, which is efficient and robust to degraded image quality. Complete unique feature extraction supported unsupervised learning was also show to reveal a hidden pattern from eyelid movements also as reduce the feature dimension. The proposed method was evaluated and shown good performance.

ISSN: 2233-7857 IJFGCN

2.4. Driver Alcohol Detection System Based on Virtual Instrumentation.
Author: Gabriel Gasparesc

Description: A driver alcohol detection by breath testing, developed using Arduino Compatible Compiler for Lab VIEW (ACCL) that permits programming Arduino boards with Lab view. The system is during a position to measure the alcohol concentration from breath samples and control the operation of the car ignition to prevent drunk driving. Also, the utilization of virtual instrumentation provides high flexibility, unlike traditional solutions. Nowadays, drunk driving has become a significant phenomenon in modern society. it is a standard explanation for car crashes involving human error.

2.5. Alcohol Detecting and Notification System for Controlling Drink Driving.
Author: Oloyede Mukhtar Abiodun, Michael David, and Waheed Moses Audu

Description: It takes life and healthy to tackle challenges for sustainable development also as harness the advantages thereof. The scourge of drink driving has led to a loss of life and properties. Control measures to make sure drivers aren't under the influence of alcohol while driving like the Blood Alcohol Content (BAC) check remains unrealizable thanks to the large personnel, equipment, and maintenance cost involved. A less consuming effort has been proposed using an mq3 gas sensor mounted on the steering wheel, powered by the ignition of the vehicle, to detect the alcohol level of the subject controlling it. The alcohol detected from the topic is processed by an ATMEGA 16 Microcontroller that compares it with a group threshold for compliance. If the edge is exceeded three modules are simultaneously triggered. The fuel supply control module is activated by a relay to chop off supply towards bringing the vehicle to a momentary halt. The Liquid Crystal Display (LCD) module is activated to show alcohol has been detected. The Global System for Mobile communication (GSM) module sends the same notice on the LCD to the subject's next-of- kin/law-enforcement-agent phone line for immediate attention. This system was developed and tested using a toy car.

3. Existing System

Detecting drowsiness in drivers by sensing of physiological characteristics, sensing driver operation, sensing auto response and monitoring the response of driver. Among these methods, the techniques that are best, supported accuracy are those supported human physiological phenomena. The leaning of the driver's head and thus the open/closed states of the eyes. Sensing electrodes would want to be attached directly onto the driver's body, and hence be annoying and distracting to the drive. Additionally, while driving would end in perspiration on the sensors, diminishing their ability to observe accurately. The second technique is compatible for world driving conditions since it are often non-intrusive by using optical sensors of video cameras to detect changes.

ISSN: 2233-7857 IJFGCN

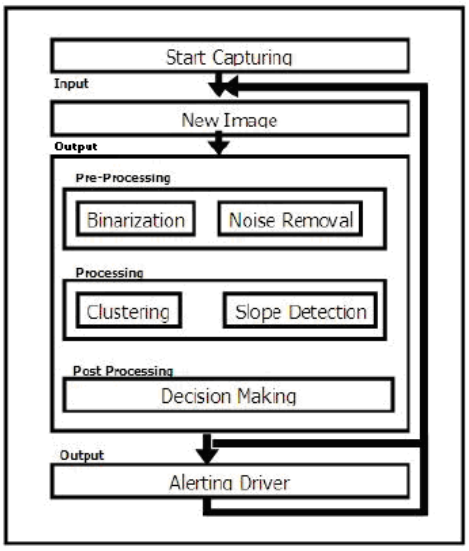

Figure 1. Existing system Architecture

Disadvantages:

- It is not realistic.
- The sensing electrodes attached directly onto the driver's body, and hence be annoying and distracting to the driving force.

4. Proposed System

In this project we tend to use the retinal reflection (only) as a way to finding the eyes on the face, then victimization the absence of this reflection as how of police work once the eyes area unit closed. It absolutely was then found that this system won't be the only technique of observation the eyes for 2 reasons. First, in lower lighting conditions, the number of retinal reflection decreases; and second, if the person has tiny eyes the reflection won't show. Here we also track the situation of the user if any emergency occur then system automatically send location of the user to its loved one and nearest hospital and police headquarters and also detect user are drunk or not.

5. System Architecture

ISSN: 2233-7857 IJFGCN

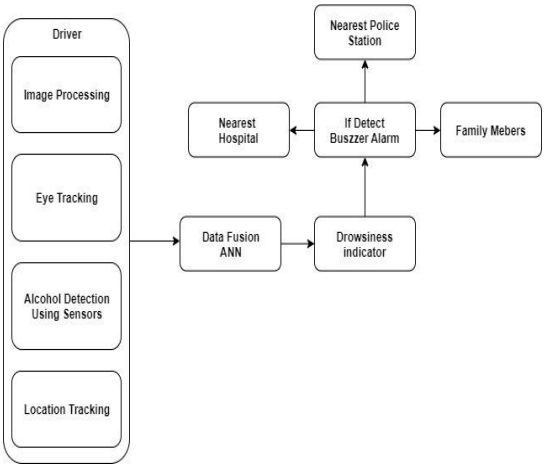

Figure 2. System Architecture

6. Algorithm

6.1 Viola-Jones Algorithm:

- Set the minimum window size, and sliding step corresponding to that size.
- For the chosen window size, slide the window vertically and horizontally with the same step. At each step, a set of *N* face recognition filters is applied. If one filter gives a positive answer, the face is detected in the current widow.
- If the size of the window is the maximum size stop the procedure. Otherwise increase the size of the window and corresponding sliding step to the next chosen size and go to the step 2.

6.2 **Haversine Algorithm For Location:**

- The haversine of the central angle (which is d/r) is calculated by the following formula:

  $(d/r)=\text{haversine}(\Phi 2-\Phi 1)+\cos(\Phi 1)\cos(\Phi 2)\text{haversine}(\lambda 2-\lambda 1)$

- Where r is the radius of earth (6371 km), d is the distance between two points, is latitude of the two points and is longitude of the two points respectively.

7. Mathematical Model

Let S Be the System and it consist of following: S={I, P, O, Su, F}
where,

- I=No of inputs.
  - I={U}
  - U= No of Users
  - o U={u1, u2, …., un}
- O=Output of the project
  - That means detect users are drowsy or not.
- P=Processes that are follow:
  - P={U,DD,ET,ED,AD,LT}
    - U= users can drive vehicle.
    - DD=Drowsy Detection.
    - ET= Eye Tracking.
    - ED=Eye Detection

ISSN: 2233-7857 IJFGCN

- AD= alcohol Detection
- LT=Location Tracking

- Su=Success if our system can detect correctly the users are drowsy or not.
- F= Failure of the system if it crashed.

Reference

[1] MTaner Danisman, Ian Marius Bilasco, Chabane Djeraba, Nacim Ihaddadene, "Drowsy Driver Detection ystem Using Eye Blink Patterns", International Conference on Machine and Web Intelligence (ICMWI 2010), Oct 2010, Alger, Algeria. pp.230-233, 28 Sep 2018Imaging Sonar Based Real-Time Underwater Object Detection Utilizing Adaboost Method, Byeongjin Kim and Son-Cheol Yu.

[2] Wei Han, Yan Yang, Guang-Bin Huang, Olga Sourina, Felix Klanner, and Cornelia Denk, "Driver Drowsiness Detection Based on Novel Eye Openness Recognition Method and Unsupervised Feature Learning", Conference Paper · October 2015 DOI: 10.1109/SMC.2015.260.

[3] Javed Ahmed, Jian-Ping Li, Saeed Ahmed Kran, Riaz Ahmed Shaikr, "Eye Behaviour Based Drowsiness Detection System", 978- 1-4673-8266-3115/$31.00 ©20151EEE.

[4] Gabriel Gasparesc, "Driver Alcohol Detection System Based on Virtual Instrumentation",IFAC PapersOnLine 51-6 (2018) 502–507.

[5] Oloyede Mukhtar Abiodun, Michael David, and Waheed Moses Audu,"Alcohol Detecting and Notification System for Controlling Drink Driving", 2nd International Conference on Information and Communication Technology and Its Applications (ICTA 2018) Federal University of Technology, Minna, Nigeria September 5 – 6,2018.

[6] Gonzalez, Rafel C. and Woods, Richard E. “Digital Image Processing”, *Prentice Hall:* Upper Saddle River, N. J., 2002.

[7] Perez, Claudio A. et al. “Face and Eye Tracking Algorithm Based on Digital Image Processing”, *IEEE System, Man and Cybernetics 2001 Conference,* vol. 2 (2001), pp1178-1188.

[8] Y. B. R. and S. P. M. Vaishnav, V Umedev M Vinothini, ‘Intelligent Alcohol Detection System for Car’, *Int. J. Sci. Eng. Res.*, vol. 5, no. 11, 2014, pp 598-601.

[9] K. Sharukh and K. Shahabaz, ‘HIGH SENSITIVE ALCOHOL SENSOR WITH AUTO CAR Technical Specifications ’:, *Int. J. Sci. Eng. Res.*, vol. 4, no. 10, 2013, pp. 1573-1581.

ISSN: 2233-7857 IJFGCN