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DRIVER DISTRACTION DETECTION USING PYTHON & OPENCV

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ABSTRACT:

Driver fatigue is one of the major causes of accidents in the world. Detecting the drowsiness of the driver is one of the surest ways of measuring driver fatigue. In this project we aim to develop a prototype drowsiness detection system. This system works by monitoring the eyes of the driver and sounding an alarm when he/she is drowsy. The system so designed is a non-intrusive real-time monitoring system. The priority is on improving the safety of the driver without being obtrusive. In this project the eye blink of the driver is detected. If the drivers eyes remain closed for more than a certain period of time, the driver is said to be drowsy and an alarm is sounded. The programming for this is done in OpenCV using the Haarcascade library for the detection of facial features

Keywords: Drowsiness Detection, Eye-blink, ML, python, etc

INTRODUCTION:

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. The aim of this project is to develop a prototype drowsiness detection system. The focus will be placed on designing a system that will accurately monitor the open or closed state of the driver's eyes in real-time. By monitoring the eyes, it is believed that the symptoms of driver fatigue can be detected early enough to avoid a car accident. Detection of fatigue involves the observation of eye movements and blink patterns in a sequence of images of a face. [1] Initially, we decided to go about detecting eye blink patterns using Matlab. The procedure used was the geometric manipulation of intensity levels. The algorithm used was as follows. 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 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. The aim of this project is to develop a prototype drowsiness detection system. The focus will be placed on designing a system that will accurately monitor the open or closed state of the driver's eyes in real-time. By monitoring the eyes, it is believed that the symptoms of driver fatigue can be detected early enough to avoid a car accident. Detection of fatigue involves the observation of eye movements and blink patterns in a sequence of images of a face. [1] Initially, we decided to go about detecting eye blink patterns using Matlab. The procedure used was the geometric manipulation of intensity levels. The algorithm used was as follows. 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

LITERATURE SURVEY:

Real-Time Drowsiness Detection Algorithm for Driver State Monitoring Systems

Jang Woon Baek; Byung-Gil Han; Kwang-Ju Kim; Yun-Su Chung; Soo-In Lee

Published in: 2018 Tenth International Conference on Ubiquitous and Future Networks (ICUFN), In this paper, we proposes a novel drowsiness detection algorithm using a camera near the dashboard. The proposed algorithm detects the driver's face in the image and estimates the landmarks in the face region. In order to detect the face, the proposed algorithm uses an AdaBoost classifier based on the Modified Census Transform features.

Real-time Driver Drowsiness Detection based on Eye Movement and Yawning using Facial Landmark

Ali Mansour Al-madani; Ashok T. Gaikwad; Vivek Mahale; Zeyad A.T. Ahmed; Ahmed Abdullah A. Shareef

Published in: 2021 International Conference on Computer Communication and Informatics (ICCCI), This study has developed a real-time driver drowsiness detection based on eye movement and yawning using facial landmarks and dlib. This system helps to avoid accidents caused by drowsiness by detecting eye movements and yawning of the driver. The advantages of this system are low cost and minimized the requires the resource. The behavioral analysis method monitor results from the driver's facial landmark while driving without the need to place sensors in the driver's body.

Advanced Driver Assistance System for the drowsiness detection using facial landmarks

Luis Darío Sinche Cueva; Jorge Cordero

Published in: 2020 15th Iberian Conference on Information Systems and Technologies (CISTI). This paper presents the development of a solution to detect a driver's drowsiness in real time and issue alerts to avoid possible traffic accidents. In particular, an analysis of the methods used for the detection of drowsiness by computer vision is performed, focusing on the use of facial reference points. Distraction, drowsiness, tiredness, speeding and fatigue are the main causes of accidents and, precisely, advanced driver assistance systems ADAS help reduce these serious human errors.

Drowsiness Detection of a Driver using Conventional Computer Vision Application

Hitendra Garg

Published in: 2020 International Conference on Power Electronics & IoT Applications in Renewable Energy and its Control (PARC). The system employed various Computer Vision applications using blink rate, eye closure, yawning to effectively and quickly identify the drowsiness of a driver during driving the vehicle and alter the driver accordingly.

Driver Drowsiness Detection by Yawn Identification Based on Depth Information and Active Contour Model

Mina Zohoorian Jafari Yazdi; Mohsen Soryani

Published in: 2019 2nd International Conference on Intelligent Computing, Instrumentation and Control Technologies (ICICICT). These include yawning and eye closure which determine whether or not the driver is in an adequate condition for driving.

A Method of Driver's Eyes Closure and Yawning Detection for Drowsiness Analysis by Infrared Camera
Wisaroot Tipprasert; Theekapun Charoenpong; Chamaporn Chianrabutra; Chamaiporn Sukjamsri

Published in: 2019 First International Symposium on Instrumentation, Control, Artificial Intelligence, and Robotics (ICA-SYMP). Proposed a method to detect driver's eyes closure and yawning for drowsiness analysis by infrared camera.

DrowsyDet: A Mobile Application for Real-time Driver Drowsiness Detection
Chaohui Yu; Xin Qin; Yiqiang Chen; Jindong Wang; Chenchen Fan . Published in: 2019 IEEE SmartWorld, Ubiquitous Intelligence & Computing, Advanced & Trusted Computing, Scalable Computing & Communications, Cloud & Big Data Computing, Internet of People and Smart City Innovation (SmartWorld/SCALCOM/UIC/ATC/CBDCom/IOP/SCI). CNN (Convolutional Neural Networks) models are built to classify facial drowsiness state, eyes state

Driver Drowsiness Detection System Based on Visual Features
Fouzia; R. Roopalakshmi; Jayantkumar A. Rathod; Ashwitha S. Shetty; K. Supriya

Published in: 2018 Second International Conference on Inventive Communication and Computational Technologies (ICICCT). a driver drowsiness detection system is proposed in this paper, which makes use of eye blink counts for detecting the drowsiness.

Development of an intelligent drowsiness detection system for drivers using image processing technique
Amin Azizi Suhaiman; Zazilah May; Noor A'in A.Rahman

Published in: 2020 IEEE Student Conference on Research and Development (SCOReD). In this work, a real-time system that utilizes computerized camera to automatically track and process driver's eye using Python, dlib and OpenCV is proposed.

Machine Learning and Gradient Statistics Based Real-Time Driver Drowsiness Detection
Cyun-Yi Lin; Paul Chang; Alan Wang; Chih-Peng Fan

Published in: 2018 IEEE International Conference on Consumer Electronics-Taiwan (ICCE-TW). In this paper, the machine learning and gradient statistics based driver drowsiness detection is developed for the real-time application.

PROPOSED SYSTEM:

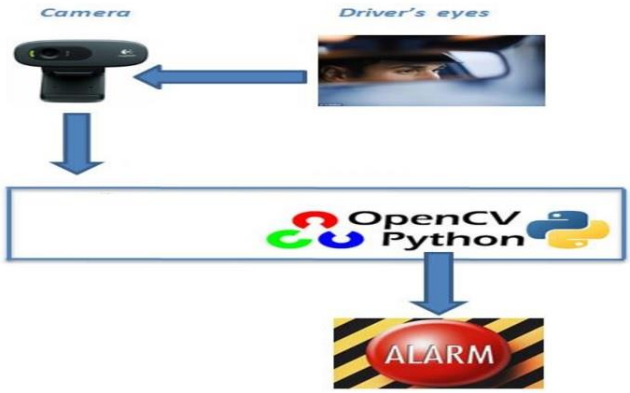

Fig: Proposed System

Let S be the whole System,

• S={I,P,O}

I=input,

P=procedure

O= Output

• I = {I0 ,I1, I2}

I0 = user

I1= user password

I2= live image

• P = {P0, P1,P2,P3}

P0= Prprocessing

P1= Feature Extraction

P2= Comparison

P3=Classification

P4= Show Results

• O = {O0,O1}

O0= Detect Eye Blink

O1= Notify Distraction

RESULTS:

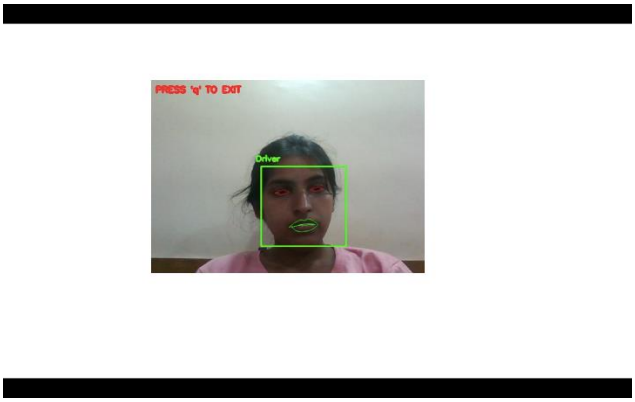

Fig: Results

CONCLUSION

A system that is compact and provides fast processing in real time is proposed in this paper. The system uses traditional as well as new and advanced methods such as machine learning to provide better results than previous systems. Nonintrusive concepts are used as it doesn't make driver uncomfortable as intrusive methods do. Using this system, many lives that are lost every day due to micro sleep caused accidents can be saved. There are number of improvements that can be made such as controlling car along with alerting the driver, making the system intelligent enough to work with driver using goggles and face mask as well

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[2] Nidhi Sharma, V. K. Banga, Drowsiness Warning System Using Artificial Intelligence, World Academy of Science, Engineering and Technology 43 2010

[3] Behnoosh Hariri, Shabnam Abtahi, Shervin Shirmohammadi, Luc Martel, A Yawning Measurement Method to Detect Driver Drowsiness.

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