REAL TIME DRIVER DROWSINESS SYSTEM BY USING PYTHON

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ABSTRACT

A new approach towards automobile safety and security with autonomous region based automatic car system is proposed in this concept. We propose three distinct but closely related concepts viz. a Drowsy Driver Detection system with driver monitoring system concept. In recent time's automobile fatigue related crashes have really magnified. In order to minimize these issues, we have incorporated driver alert system by monitoring both the driver's eyes as well as sensing as well as the driver situation based local environment recognition based AI system is proposed. finally we connect hardware setup to make vehicle to stop

KEYWORD: *Convolutional neural network, driver fatigue detection, PERCLOS, FOM.*

1. INTRODUCTION

Now a days the major accident is based on the driver'sdrowsiness, to rectify this in future and in the automated cars we are going to monitor the driver. By this we are going to detect the eyes of the driver and to monitor driver using this system. This system uses Kinect sensor, will detect the images in 3D so that we can obtain the exact results for the system. Additionallyin this system we are going to detect the head movement of the driver so that we can detect the exact movement of the driver.

Here the exact driver is identified by the humans skeleton identification method.the human is identified by the joints of the human.so that we can easily identify the moving parts in the body.by this we are going to detect the human skeleton.with the use of Kinect sensor we are going to achieve this.

2.LITERATURE SURVEY

A. Malla, P. Davidson, P. Bones, R. Green and R. Jones, "Automated Video-based Measurement of Eye Closure for Detecting Behavioral Microsleep", in 32nd Annual International Conference of the IEEE, Buenos Aires, Argentina, 2010.

A device capable of continuously monitoring an individual's levels of alertness in real-time is highly desirable for preventing drowsiness and microsleep related accidents. This paper presents a development of non-intrusive and light-insensitive video-based system that uses computer-vision methods to measure facial metric for identifying visible facial signs of drowsiness and behavioral microsleep. The developed system uses a remotely placed camera with a near-infrared illumination to acquire the video. The computer-vision methods are then applied to sequentially localize face, eyes, and eyelids positions to measure ratio of eye closure. The system was evaluated in frontal images of nine subjects with varying facial structures and exhibiting several ratio of eye closure and eye gaze under fully dark and ambient lighting conditions. The preliminary results showed promising results with sufficient accuracy to distinguish between fully closed, half closed, and fully open eyes.

P. Viola and M. Jones, "Rapid Object Detection using a Boosted Cascade of Simple Features", in Proceedings of the IEEE Computer Society Conference on Computer Vision and Pattern Recognition, 2001

This paper describes a machine learning approach for visual object detection which is capable of processing images extremely rapidly and achieving high detection rates. This work is distinguished by three key contributions. The first is the introduction of a new image representation called the "integral image" which allows the features used by our detector to be computed very quickly. The second is a learning algorithm, based on AdaBoost, which selects a small number of critical visual features from a larger set and yields extremely efficient classifiers. The third contribution is a method for combining increasingly more complex classifiers in a "cascade" which allows background regions of the image to be quickly discarded while spending more computation on promising object-like regions. The cascade can be viewed as an object specific focus-of-attention mechanism which unlike previous approaches provides statistical guarantees that discarded regions are unlikely to contain the object of interest. In the domain of face detection the system yields detection rates comparable to the best previous systems. Used in real-time applications, the detector runs at 15 frames per second without resorting to image differencing or skin color detection.

S. Vitabile, A. Paola and F. Sorbello, "Bright Pupil Detection in an Embedded, Real-time Drowsiness Monitoring System", in 24th IEEE International Conference on Advanced Information Networking and Applications, 2010.

Driver's drowsiness is stated as an important cause of road and highway accidents. Therefore, the development of a system for monitoring the driver's level of fatigue is desirable in order to prevent accidents. The paper presents the design and the implementation of a system able to find and evidence the drowsiness level of a driver in an ordinary motor vehicle, in order to prevent car accidents. The system, made up of a car installed infrared video camera connected to the Celoxica RC203E FPGA based board, is able to perform a real time video stream processing. The system exploits the “bright pupil” phenomenon produced by the retina, that reflects the 90% of the incident light when a radiation of 850 nm wavelength hit the retina itself. While acquiring the video, a processing chain is executed to detect driver's eyes and to compute a PERCLOS (Percentage of Eye Closure) function linked to the drowsiness level of a driver. The achieved experimental results show that an entire 720*576 frame processing requires only 16.7 ms, so that the system is able to perform real-time PAL video stream processing and has the potentiality to process 60 frames/sec. The effectiveness of the proposed drowsiness detection system has been successfully tested with a human subject in real operating condition, tracking driver's eyes and detecting drowsiness failures.

3.SYSTEM ANALYSIS

3.1 Existing System

IR sensor placing on eye for fatigue detection the problem with the system it is having user aiding in complex with placing sensor over the eye directly.

3.2 Drawbacks

a. Performance depends on compiler

b. Poor code density

c. RISC has a fixed size of instruction format

d. Small number of instructions

3.3 Proposed Method

- Driver Assistance system with Kinect camera
- Vehicle external vehicle availability detection
- Human detection based attention
- Eye blink monitor
- Head rotation monitor

3.4 Objective

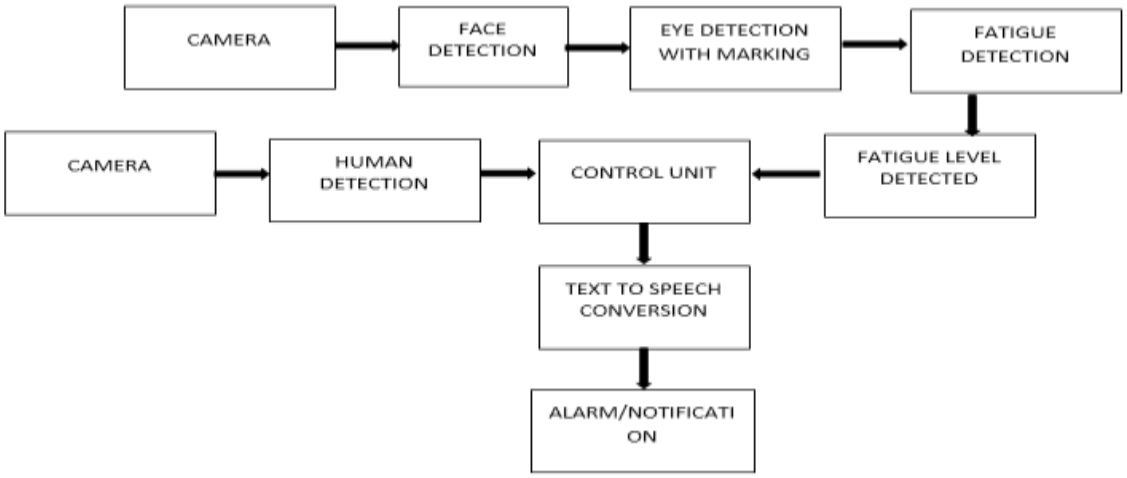
The main objective of this project is to identify the drowsiness of the driver by eye blink and the head movement activities.

3.5 Advantage

- Driver Assistance system with Kinect focusing user hash free user assistance provided.
- Avoid accidents
- Alerting driver

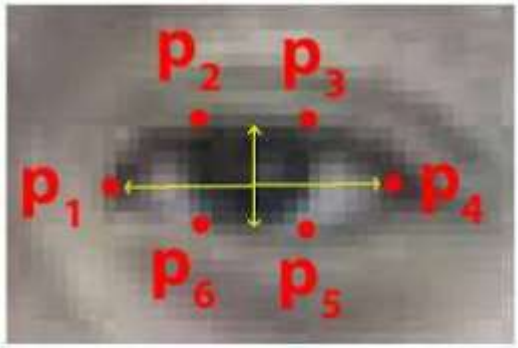
4.SYSTEM DESIGN

4.1 Block diagram



4.2Eye Detection and Drowsiness Detection:

From the face, the eyes are detected for further processing to detect whether the driver is in drowsiness or not. In this, we are specially characterizing the eyes from the face. A real time algorithm to detect eye blinks in a video sequence from a camera is used in this proposed system. Recent landmarks detectors exhibit excellent robustness against a head orientation with respect to a camera, varying illumination and facial expressions. In this project, the landmarks are detected precisely enough to estimate the level of the eye opening. The proposed algorithm therefore estimates the landmark positions, extracts a quantity which is known as the eye aspect ratio (EAR) for characterizing the eye opening in each frame



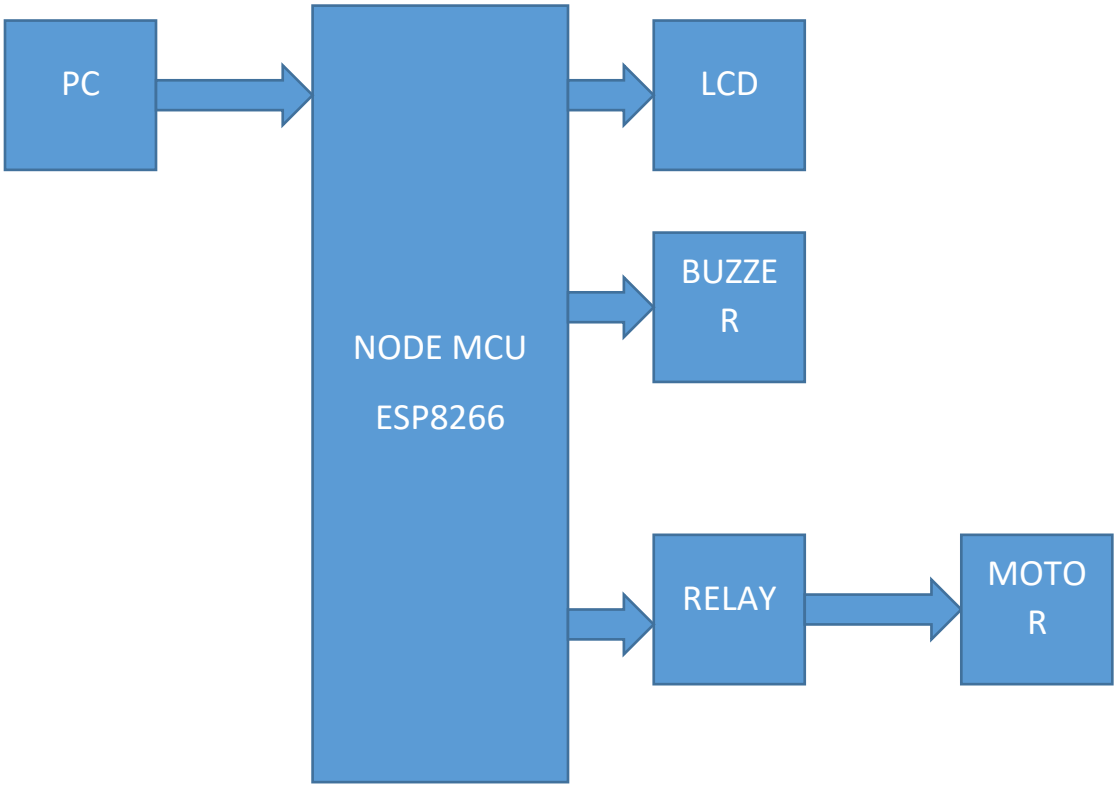
In this technique, we are using different landmarks to detect the opening and closing of eye. This landmark detectors that capture most of the characteristic points on a human face image. The eye blink is a fast closing and reopening of a human eye. Each individual person has a little bit different pattern of blinks. The pattern differs in the speed of closing and opening of the eye, a degree of squeezing the eye and in a blink duration. The eye blink lasts approximately 100-400ms. From the landmarks detected in the image, we derive the eye aspect ratio (EAR) that is used as an estimate of the eye opening state. For every video frame, the eye landmarks are detected. The eye aspect ratio between height and width of the eye is computed. From the fig. 2 P1,P2,…,P6 are the landmarks on the eye.

The EAR is mostly constant when an eye is open and is getting close to zero while closing an eye. Since eye blinking is performed by both eyes synchronously, the EAR of both eyes are taken and it is averaged. After getting the EAR value, if the value is less than the limit for 2 or 3 seconds the driver is said to be drowsy. The buzzer connected to the system performs actions to correct the driver abnormal behavior.

5.HARDWARE REQUIREMENTS:

- Kinect sensor
- Main processor
- Minimum RAM 2 GB
- Hard disk 80GB

5.1 HARDWARE BLOCK DIAGRAM:



v6.SOFTWARE REQUIREMENTS

- Python

- Arduino IDE
- Open Cv

7.RESULT

The development of environment perception and modeling technology is one of the key aspects for intelligent vehicles. This paper presents an overview of the state of the arts of environment perception and modeling technology. First, the pros and cons of vehicular sensors are presented. Next, popular modeling methods and algorithms of lane and road detection, traffic sign recognition, vehicle tracking, Drowsiness detection and behavior analysis, and scene understanding are reviewed. Public datasets and codes of environment perception and modeling technology are also described. Current challenges for environment perception and modeling technology are due to the complex outdoor environments and the need of efficient methods for their perception in real time. The changeable lighting and weather conditions, and the complex backgrounds, especially the presence of occluding objects still represent significant challenges to intelligent vehicles. Furthermore, it is very important to recognize road in the off-road environment. Since environment perception and modeling technology stage is the link with the work of localization and map building, path planning and decision-making, and motion control, the next step is to develop the entire system.

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