TRAFFIC SIGN AND DROWSINESS DETECTION USING OPEN-CV

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ABSTRACT - The detection of traffic sign from images plays a vital role in Computer vision .The various machine and mathematical models, for classifying traffic sign including Scale Invariant Feature transform (SIFT) and Dominant Rotated Local Binary Pattern (DRLBP) has been proposed yields better performance. This paper proposes a novel method of classifying the traffic sign using Artificial Neural Network. This is done by pre-processing the traffic sign image at first and then extracting the face features using SIFT. Then the detection of traffic sign is done using Back Propagation Network (BPN). The processes of combining SIFT and DRLBP perform better rather using separately. In addition, this paper is to develop a technique for drowsiness detection system. Our whole focus and concentration will be placed on designing the system that will accurately monitor the open and closed state of the person's eye. By constantly monitoring the eyes, it can be seen that the symptoms of person fatigue can be detected early enough to avoid an accident.This detection will be done employing a sequence of pictures of eyes further as face.The observation of eye movements and its edges for the detection are used

KEYWORDS - OPEN-CV, SIFT, DRLBP, GLCM, ANN-Back Propagation Network, HAAR CASCADE

INTRODUCTION

Road safety is always an area that concerned many people around the world and systems that aid the drivers have been appearing ever since cars and computers were combined to make driving safer and more efficient. There are plenty of systems that are able to warn drivers about different types of dangers: lane departure, collision possibility and various traffic signs. However, there is still room for development, because modern technologies, like the rising vision about the OPEN-CV, allow us to create much more efficient systems. Also, the detections can be improved to perform better in various situations, such as different light conditions, road quality, etc. In this project, we present the plans of a driver-assistance system, which will be capable of road lane and traffic sign detection by using an OPEN-CV.

LITERATURE SURVEY

In earlier studies for drowsiness detection, few works has been found that the algorithm recognized total face and consumed more time[9] .These algorithm recognized only static image of the face and stored in database[7]. Eye detection was recognized only in few algorithm through EEG signals which was fast in reaction but accuracy was less[2]. Later dynamic image was captured for more accuracy but only drawback was framing the eye. EEG based detection resulted in less robust system, longer computational time and restricted in use in series neural network[5]. When it was taken for real time implementation it cannot predict it easily and normal state will be considered for the yawning. For traffic sign detection appearance based methods involves LDA and Geometric methods[3]. In geometric based methods, the geometric features considered which does not provided optimal results[6].
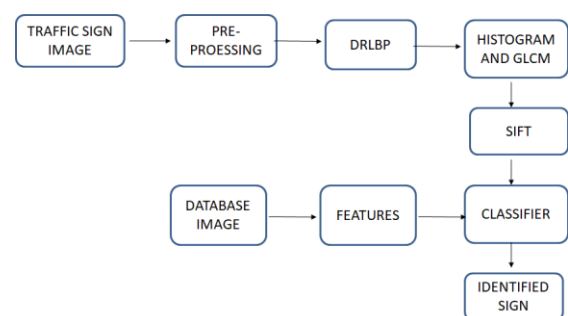
III. MATERIALS AND METHODS
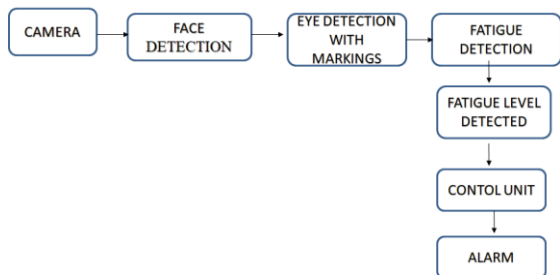
This section provides detail view on participants

Involved, drowsiness detection and thepreprocessing methodology followed to detect traffic sign.

FLOW CHART

TRAFFIC SIGN DETECTION

DROWSINESS DETECTION

METHODS

First an image for traffic sign is detected, then pre-processed and normalized. This normalized image undergoes following steps

• Dominant Rotated Local Binary Pattern(DRLBP)

• Scale invariant Feature Transform(SIFT)

• Histogram and GLCM

• ANN-Back Propagation Network

LOCAL BINARY PATTERN EXTRACTION

Divide the window into cells (e.g. 16x16 pixels for each cell).

For each pixel in a cell, compare the pixel to each of its 8 neighbours (on its left-top, left-middle, left-bottom, right-top, etc.).

Follow the pixels along a circle, i.e. clockwise or counter-clockwise.

Where the center pixel's value is greater than the neighbour's value, write "0". Otherwise, write "1". This gives an 8-digit binary number (which is usually converted to decimal for convenience).
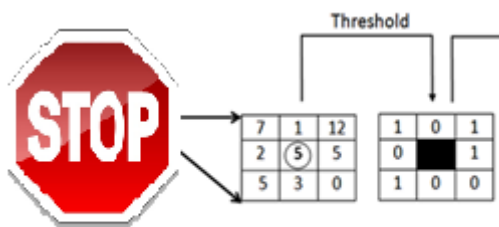

SCALE INVARIANT FEATURE TRANSFORM

Scale Invariant Feature remodel (SIFT) options are options extracted from pictures to assist in reliable matching between completely different views of a similar object. The extracted options are invariant to scale and orientation, and are extremely distinctive of the image.

They are extracted in four steps. The first step computes the locations of potential interest points in the image by detecting the maxima and minima of a set of Gaussian (DoG) filters applied at different scales all over the image. Then, these locations are refined by discarding points of low distinction. An orientation is then appointed to every key purpose supported native image options. Finally, an area feature descriptor is computed at every key purpose. This descriptor relies on the native image gradient, transformed according to the orientation of the key point to provide orientation invariance. Every feature may be a vector of dimension 128 distinctively distinguishing the neighborhood round the key purpose.

GLCMPROPERTIESCO-OCCURANCE MATRIX

A Co-occurrence matrix (CCM) by hard however typically a component with the intensity (gray-level) value i happens during a specific spatial relationship to a component with the value j.By default, the spatial relationship is outlined because the component of interest and therefore the component to its immediate right(horizontally adjacent), however you'll be able to specify different spatial relationships between the 2 pixels. Each element (i,j) in the resultant ccm is simply the sum of the number of times that the pixel with value i occurred in the specified spatial relationship to a pixel with value j in the input image. The number of grey levels within the image determines the scale of the CCM
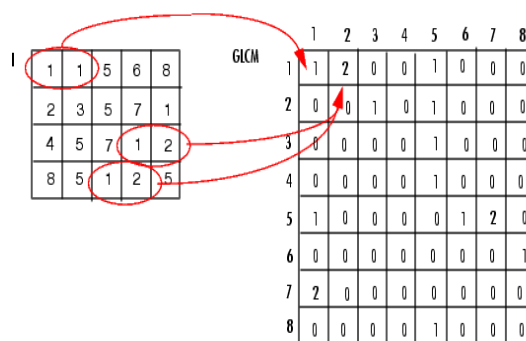
BACK PROPOGATION NETWORK

The Back Propagation network performance is evaluated in terms of training performance and classification accuracies. Back Propagation network gives fast and accurate classification. Back propagation algorithm is finally used for classifying.

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The back-propagation learning rule is accustomed modify the weights and biases of networks to attenuate the add square error of the network.
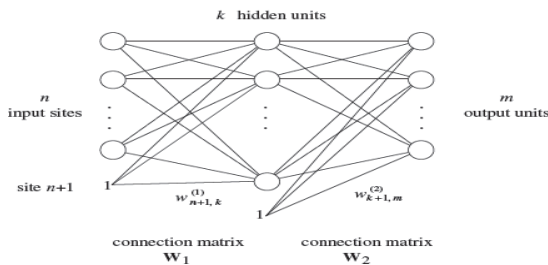
The back propagation algorithm is used to compute the necessary corrections, after choosing the weights of the network randomly.

Necessary rule of four steps:

i) Feed-forward computation

ii) Back propagation to the output layer

iii) Back propagation to the hidden layer

iv) Weight updates.

The rule is stopped once the value of the error function has become sufficiently small.

FACE DETECTION:

The input video has been captured by usingeither ipcam or webcam. From this the face is detected. Here we are using haar cascades .The main use of haar cascades is to detect the face in the input image or video.
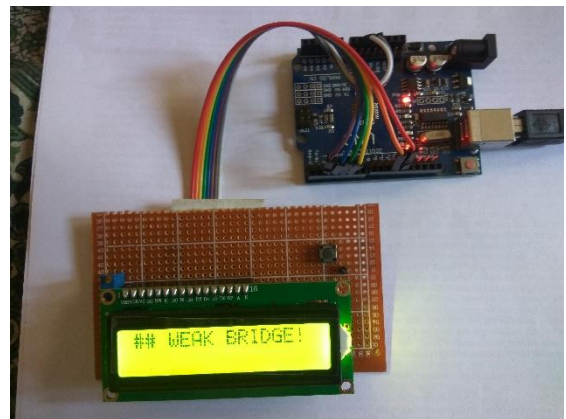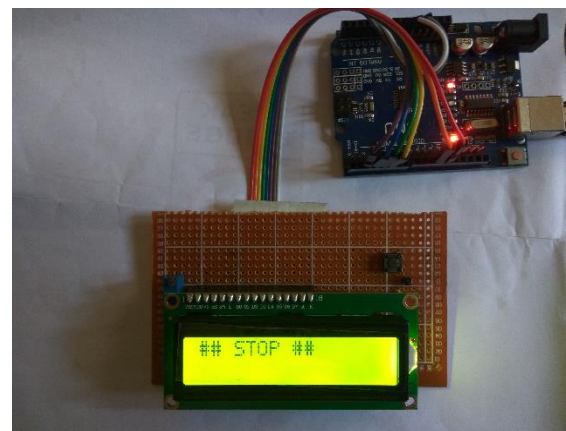
EYE DETECTION

For detection of eye the face is get identified. By the use of facial landmarks the eye is get detected. After getting the markings of the eye, it is get tracked. By fixing the points in the eye it is achieved. Based on the value between the marking points in the eye it is get alerted when its get below the threshold value
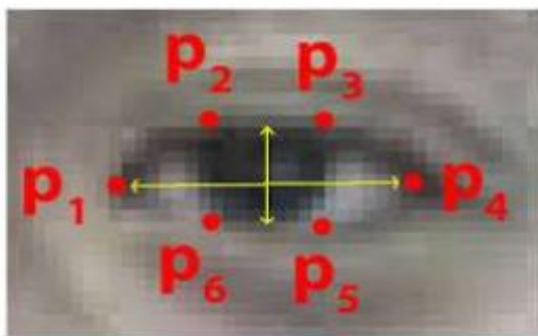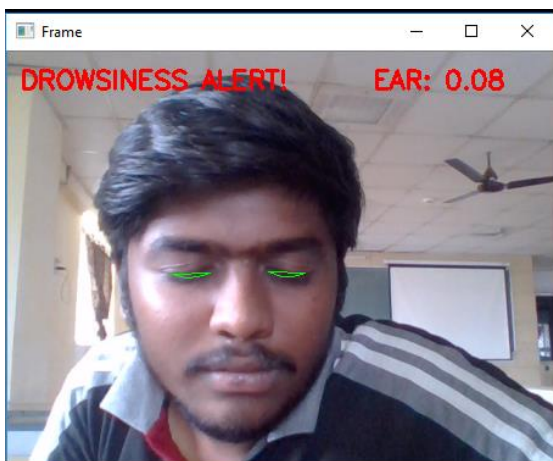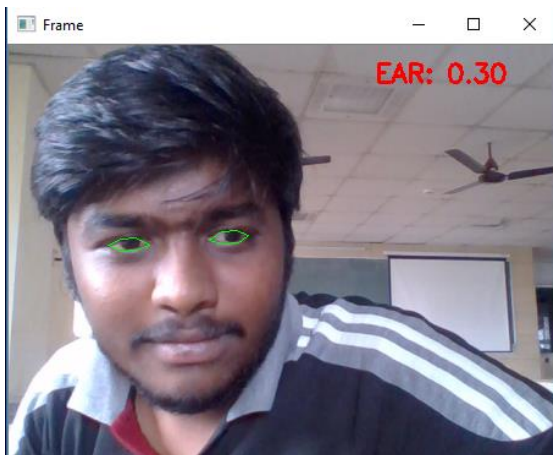

OUTPUT

TRAFFIC SIGN DTECTION

DROWSINEES DETECTION

CONCLUSION

Thus in the traffic sign detection only two traffic sign is trained in the database and for the further detection of traffic signs, the program has to be trained to detect such signs. This project work can be implemented in semi-automatic and fully automatic vehicles to control the vehicles based upon the detected traffic signs. In addition to this driver drowsiness is detected for safe guard of co-passengers and goods in the vehicle.

ACKNOLEDGEMENT

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