Object Recognition System Using Computer vision

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Abstract : **- A face recognition system is a computer application capable of identifying or verifying a person from a digital image or a video frame from a video source. Recently, it has also become popular as a commercial identification and marketing tool.an algorithm may analyses the relative position, size, and/or shape of the eyes, nose, cheekbones, and jaw. The features are then used to find for other images by using matching features. The main objective of this system is to achieve the Facial Recognition with the minimal amount of computation required. Thus principle component analysis is preferred. In PCA, every image in the training set is represented as a linear combination of weighted Eigenvectors called Eigen faces**

Index Terms - **Facial detection ,Back ground Subtraction ,Template Recognition**

I. INTRODUCTION

Drivers fatigue is a significant factor in a large number of vehicle accidents.The focus will be placed on monitoring the open or closed state of the driver's eyes in real-time and the yawing state. Once the position of the eyes and mouth is located, the system is designed to determine and detect fatigue.

1. Background Elimination
2. Face Detection

Steve Lawrence have discussed Real time visions modules. These modules interact with humans. The face detection is challenging as it needs account for all possible appearance variations caused by changes in illuminations, facial features, occlusions, etc.

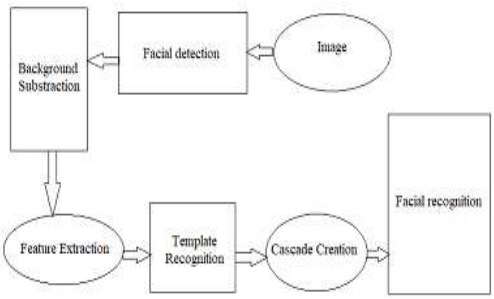
The Face Detection can be of two types:

1. We want to find one particular person for a large database. This operation may take time so it need not be done in real time.
2. We need to survey a particular area. Here we need rapid classification and identification i.e. the data needs to be identified in real time data.

II. SCOPE OF THE PROJECT

This includes namely Background Elimination, Face Detection, Eye Detection, Detection of Lip Movement.Then comes face detection using Geometric features. Then we do eye detection using Model Based Approach by using ETAR Algorithm or use Hybrid Approach by using Starburst Algorithm. Lip movement is tracked using Rule Based Detection Algorithm. The main goal is to develop a system to combine more features including mouth features, eye features to monitor driver fatigue.

III. SOFTWARE DESIGN



IV.IMPLIMENTING SUSTAINABILITY

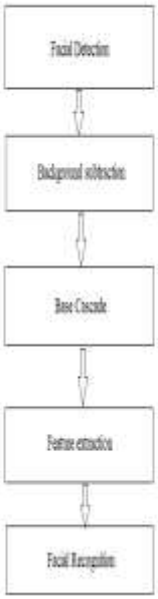
The main objective of this system is to achieve the Facial Recognition with the minimal amount of computation required. Thus principle component analysis is preferred. In PCA, every image in the training set is represented as a linear combination of weighted eigenvectors called Eigen faces. Modules are

1.Facial Detection

2.Background Subraction

3.Feature Extraction

4.Facial recognition



Description

Facial Detection :

a. The image to be give an as input for the conversion of image using lossless compression to the color code blocks using Huffman encoding. The image should be in the JPEG ,PNG format as its required condition For converting image to color code blocks.To train your own classifier for any object like car, planes etc.
b. Import the Opencv modules and the Haar cascades such as the front face and the eye detector.
c. Start alive feed with the video capture command and read the image.
d. Convert the image into the gray scale and detect the multi scale, and select a rectangle box to cover the detected area.
e. Display the detected area and destroy all the remaining windows.

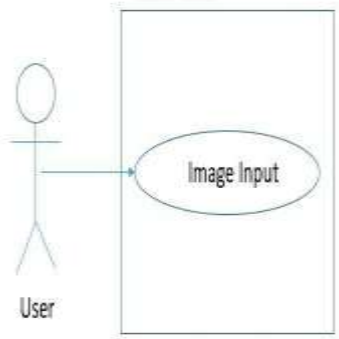


Fig 2.UML diagram of image input

Background Subraction :

a. The Background Subractor is a vital part of the visual system .When the face is detected and in the face detection module it is converted into gray scale.
b. The Sample of the same person must match so only the face features are detected and the other background are deleted.
c. So when the face area is recognised the detector will crop the person photo and save the image in the database folder.
d. We can select no of samples accordingly. The accuracy of the vision system depends upon the number of samples taken .
e. The size of the cropped image is 200*200(length * breadth)

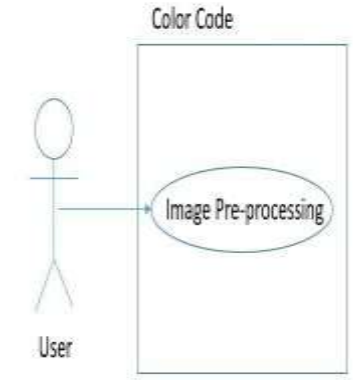


Fig 3.UML diagram of image pre-processing

Feature Extraction :

a. The Feature extraction is the main objective of the facial recognition. In the background Subractor module we take no of required samples.These samples are used to extract the Feature of a person among all the given samples
b. The component analysis is the method used here to calculate the weights of the image.
c. The Opencv and face api has the feature extractor efficiency of 82% and by taking a sample no of 30 per person the recognition is very successful.

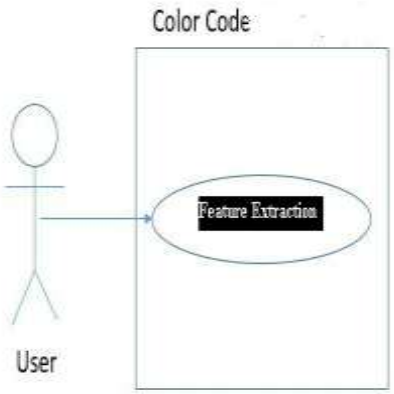


Fig 4. Feature Extraction

Facial Recognition:

The data set has already been created and stored and now we need to train the vision system to recognise the image given.

d. Use the recognizer to recognize the Id of the user. Put predicted Id/Name and Rectangle on detected face.
e. By creating a If condition matching the id's and giving the corresponding name to the id will print the name of the recognised person the frame.

f. If the person is unknown to the vision then it will print nan.
g. The data set can be imported from anywhere as long as the facial landmarks are well calculated and the mentioned in the crop size(200*200).Release the camera after the Recognition has been completed and all the window will be destroyed.

V.PROPOSED SYSTEM

The project is proposed to design a system capable of performing live data processing on binary data using Principle component analysis. It should also function as a solution to the Vision system needs of the user, holding a significant role in environments where analysing data is critical thus contributing to information processing. The vision schemes need to be computationally and functionally efficient and must look up to provide an optimal solution to the above mentioned problems. The system must be capable of taking input in the form of image files whose binary representation is processed based on ASCII values and there by changing in a text code blocks image. Appropriate component analysis are used on the data to ensure a suitable trade-off between the tasks performed and space complexity issues in-volved. The design should achieve the best possible comparison ratio, with the limited resources of a present day PC.As a result, there are strict constraints on the memory usage and the processing speed of the design. The system presently aims to work with standard ASCII-based format.

The image is then converted into binary code from the .bmp format. These binary bits are grouped together and mapped with the patterns, unique for each image, and then the final combinations of all the template is represented as a image output.

The proposed system works using the technique which PCA uses the variable to integrate its components and later the binary file data into a output verified image file. While it does the reverse on processing side which is much faster than the other algorithm the time and space complexity for this method is more like exponential time and the processing speed is 23kh calculated in the frames per second thus the live facial detection is possible by the Open cv algorithm which has all pre compiled data which is easy to import and simple to process. Thus the live video detection is possible in the visual basic frame work and the processing is displayed in the frame work created to implement all the modules at a time. Thus the processing work becomes more easy and the database is in the same folder as the exe file. The images are stored in .bmp format which is more easy to process. It can perform live detection and pre captured image also making it more useful to comply all the need

Mouth Moment Detection :

The algorithm starts from the extraction of skin pixels based upon rules derive from a simple quadratic polynomial model.First, much computation time are saved. Finally, the precise face regions are determined accordingly .

VI. PROBLEM DESCRIPTION

Many problems in computer vision were saturating on their accuracy before a decade. However, with the rise of deep learning techniques, the accuracy of these problems drastically improved. One of the major problem was that of image classification, which is defined as predicting the class of the image. A slightly complicated problem is that of image localization, where the image contains a single object and the system should predict the class of the location of the object in the image (a bounding box around the object). The more complicated problem (this project), of object detection involves both classification and localization. In this case, the input to the system will be a image, and the output will be a bounding box corresponding to all the objects in the image, along with the class of object in each box. An overview of all these problems is depicted

VII. CONCLUSION

The project named Secirity using computer vision has been designed with the ba-sic functions of python and Opencv code.System has satisfied all the proposed work.This project converts the image recognised successfully. Today's standard vision methods are subjected to various defects. Thus an innovative approach is presented in this project and it makes the information more secured by computer vision.

VIII. REFERENCES

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