



PROJECT REPORT

PROJECT TITLE - FACE RECOGNITION USING MATLAB

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COURSE -MULTIMEDIA SIGNAL PROCESSING

COURSE CODE- EAC2006

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PROJECT- FACE RECOGNITION USING MATLAB

Objective-

To develop an efficient and accurate system using MATLAB that can automatically identify and authenticate individuals based on their facial features. The project aims to achieve the following objectives: Face Detection, Face Representation, Face Matching, Recognition and Authentication.

Description :-

Facial recognition is the process of identifying human faces through technology. The facial recognition system uses computer vision and Machine Learning techniques to model and classifies facial features extracted from images and videos. Algorithms for face identification extract and map facial features and compare them to a database of known faces to find the best match.

The facial classification process classifies human faces based on gender, age, emotions, and other relevant features using certain applications. The reason why it is dissimilar to face recognition is that it only compares the differences between two different images.

Syntax description of code:

`detector = vision.CascadeObjectDetector;` -This syntax is used for the creation of a detector that detects objects using the Viola-Jones algorithm.

`Imcrop:- imcrop` creates an interactive Crop Image tool to crop the grayscale, truecolor, or binary image displayed in the current figure. `imcrop` returns the cropped image, `Icropped`.

`imresize:-` It's returns image `es` that has the number of rows and columns specified by the two-element vector `[numrows numcols]`.

`imwrite` : `imwrite(es , filename)` writes image data `es` to the file specified by `filename` , inferring the file format from the extension. `imwrite` creates the new file in your current folder.

imshow(____) returns the image object created by imshow.

drawnow : drawnow updates figures and processes any pending callbacks. Use this command if you modify graphics objects and want to see the updates on the screen immediately. drawnow limitrate limits the number of updates to 20 frames per second

Coding part:-

```
clc
clear all
close all
warning off;
cao=webcam;
faceDetector=vision.CascadeObjectDetector;
c=150;
temp=0;
while true
    e=cao.snapshot;
    bboxes =step(faceDetector,e);
    if(sum(sum(bboxes))~=0)
        if(temp>=c)
            break;
        else
            es=imcrop(e,bboxes(1,:));
            es=imresize(es,[227 227]);
            filename=strcat(num2str(temp),'.bmp');
            imwrite(es,filename);
            temp=temp+1;
            imshow(es);
            drawnow;
        end
    else
        imshow(e);
        drawnow;
    end
end
```

Training model:

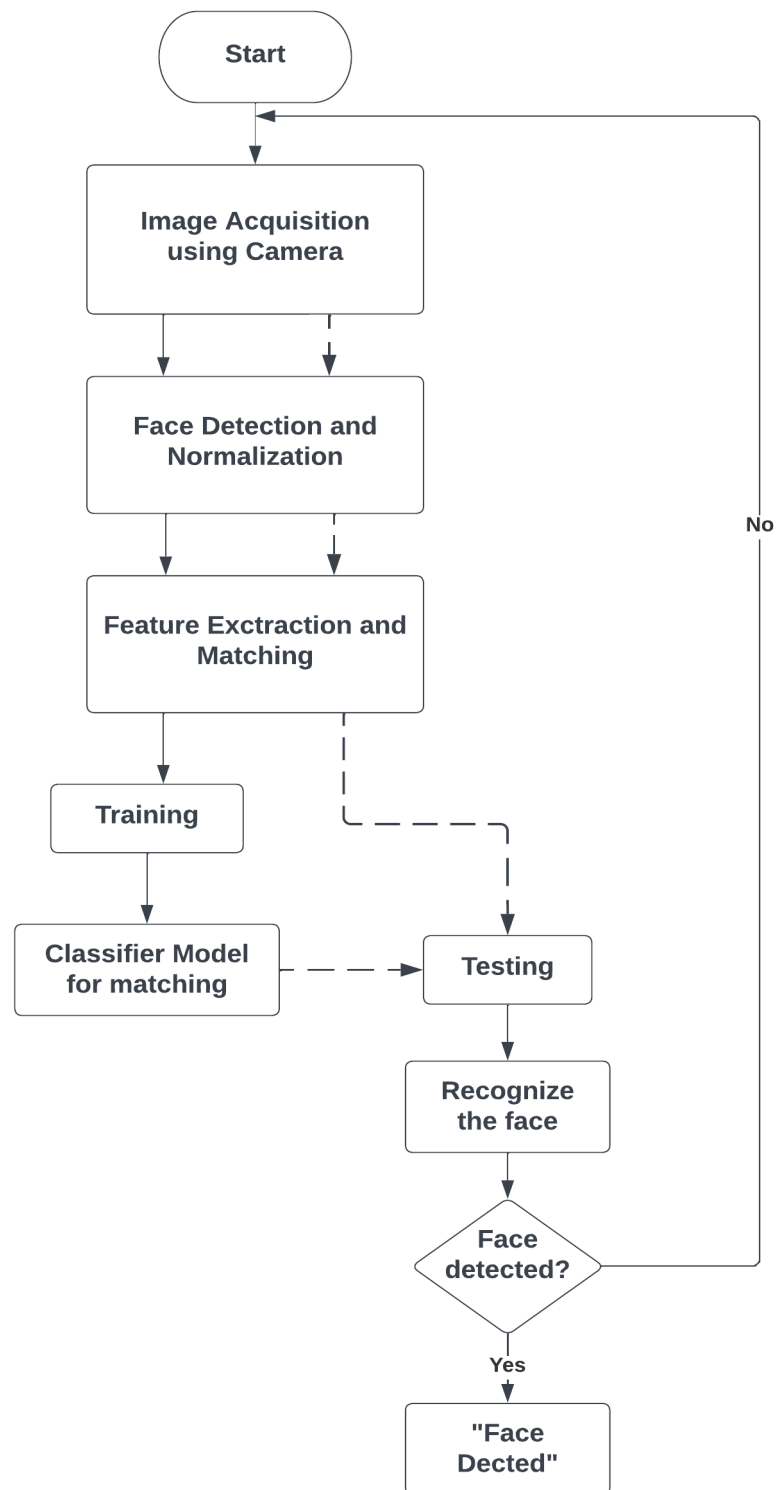
```
clc
clear all
close all
warning off
g=alexnet;
layers=g.Layers;
layers(23)=fullyConnectedLayer(2);
```

```
layers(25)=classificationLayer;
allImages=imageDatastore('datastorage','IncludeSubfolders',true,
'LabelSource','foldernames');
opts=trainingOptions('sgdm','InitialLearnRate',0.001,'MaxEpochs',20,'MiniBatch
Size',64);
myNet1=trainNetwork(allImages,layers,opts);
save myNet1;
```

Testing Model:

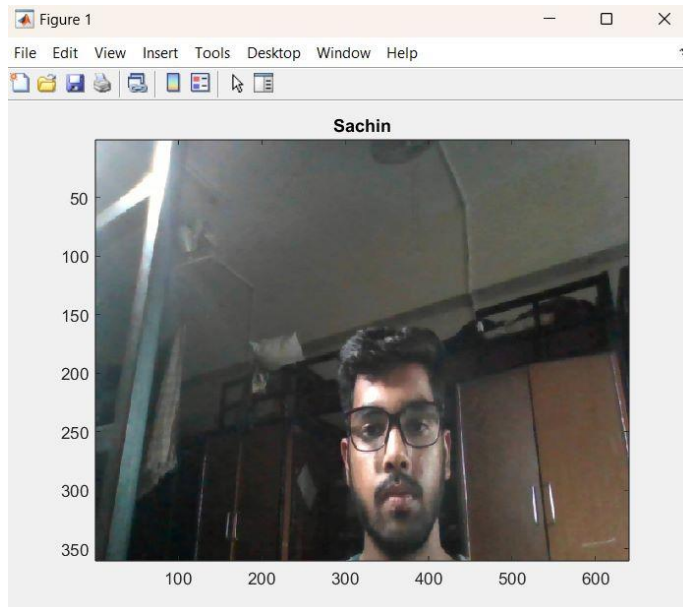
```
clc;close;clear
c=webcam;
load myNet1;
faceDetector=vision.CascadeObjectDetector;
while true
    e=c.snapshot;
    bboxes =step(faceDetector,e);
    if(sum(sum(bboxes))~=0)
        es=imcrop(e,bboxes(1,:));
        es=imresize(es,[227 227]);
        label=classify(myNet1,es);
        image(e);
        title(char(label));
        drawnow;
    else
        image(e);
        title('No Face Detected');
    end
end
```

Flowchart:

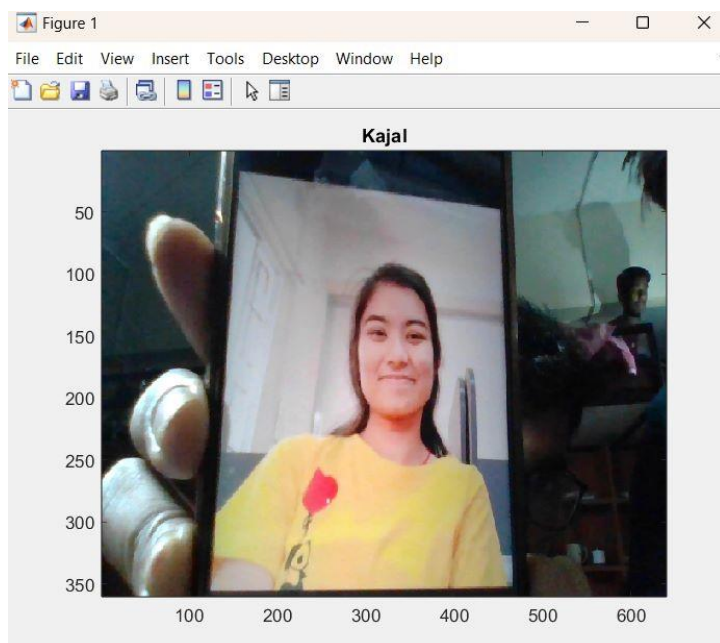


Output

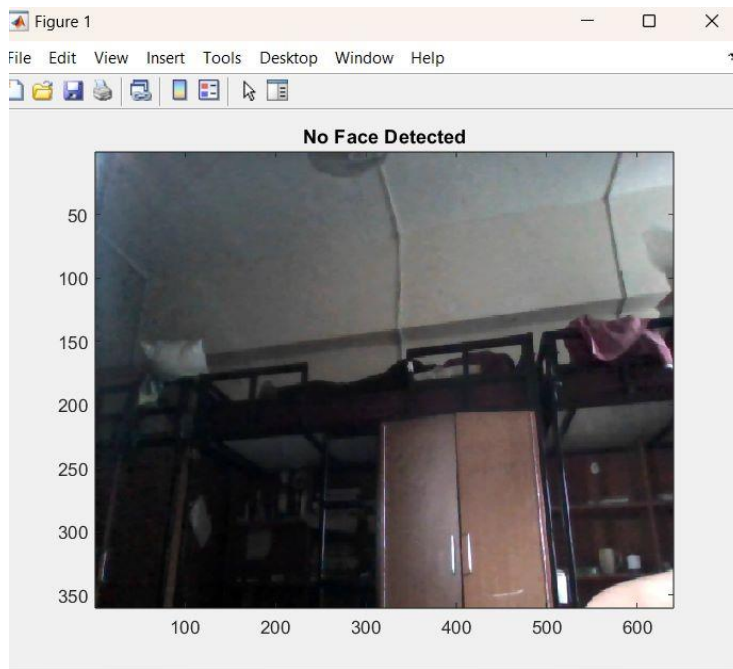
Result 1:-



Result 2:



Result 3:- When there is no object .



THANK YOU