Symbiosis Institute Of Technology
Pune

Computational Techniques II

Mini Project Assignment Report

Title: Face And Eyes Recognition

Academic Year 2019-20 Semester 2		Class: BTech E&TC 2019-23 Batch
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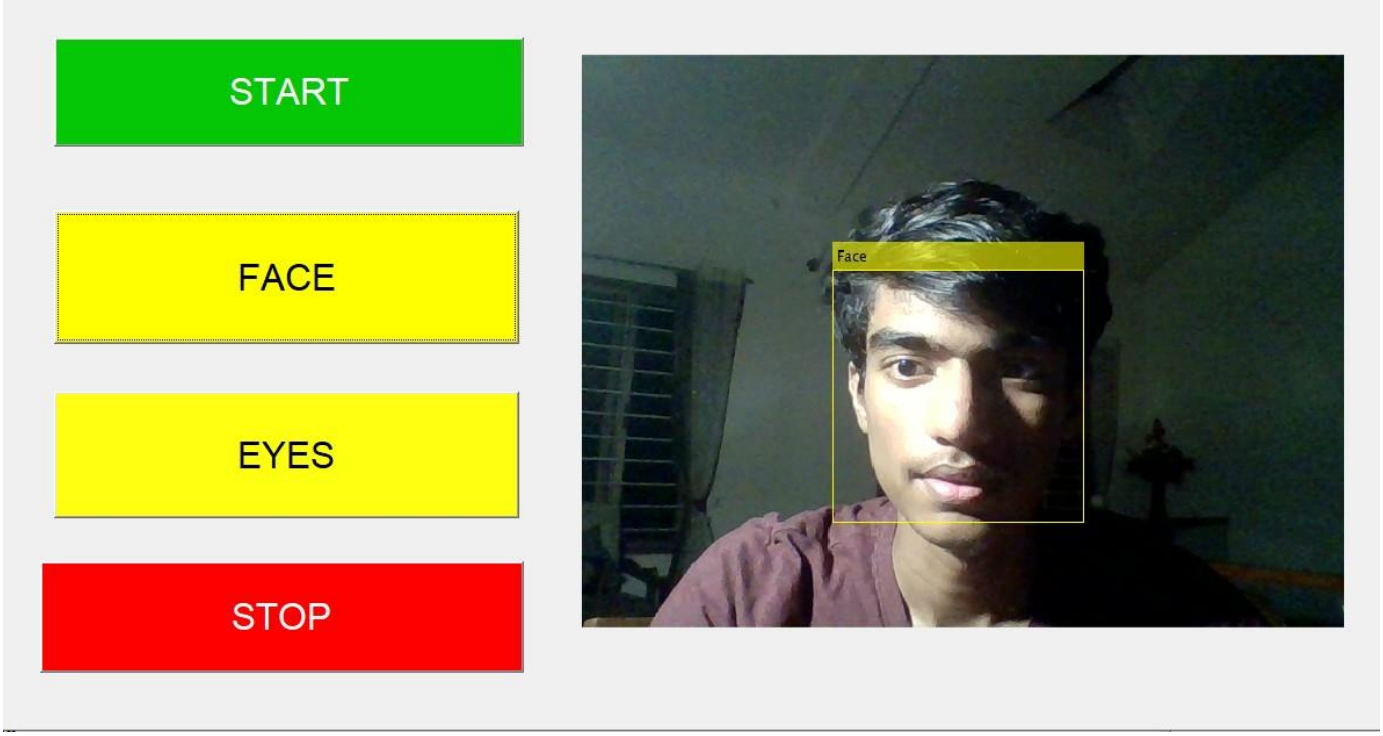
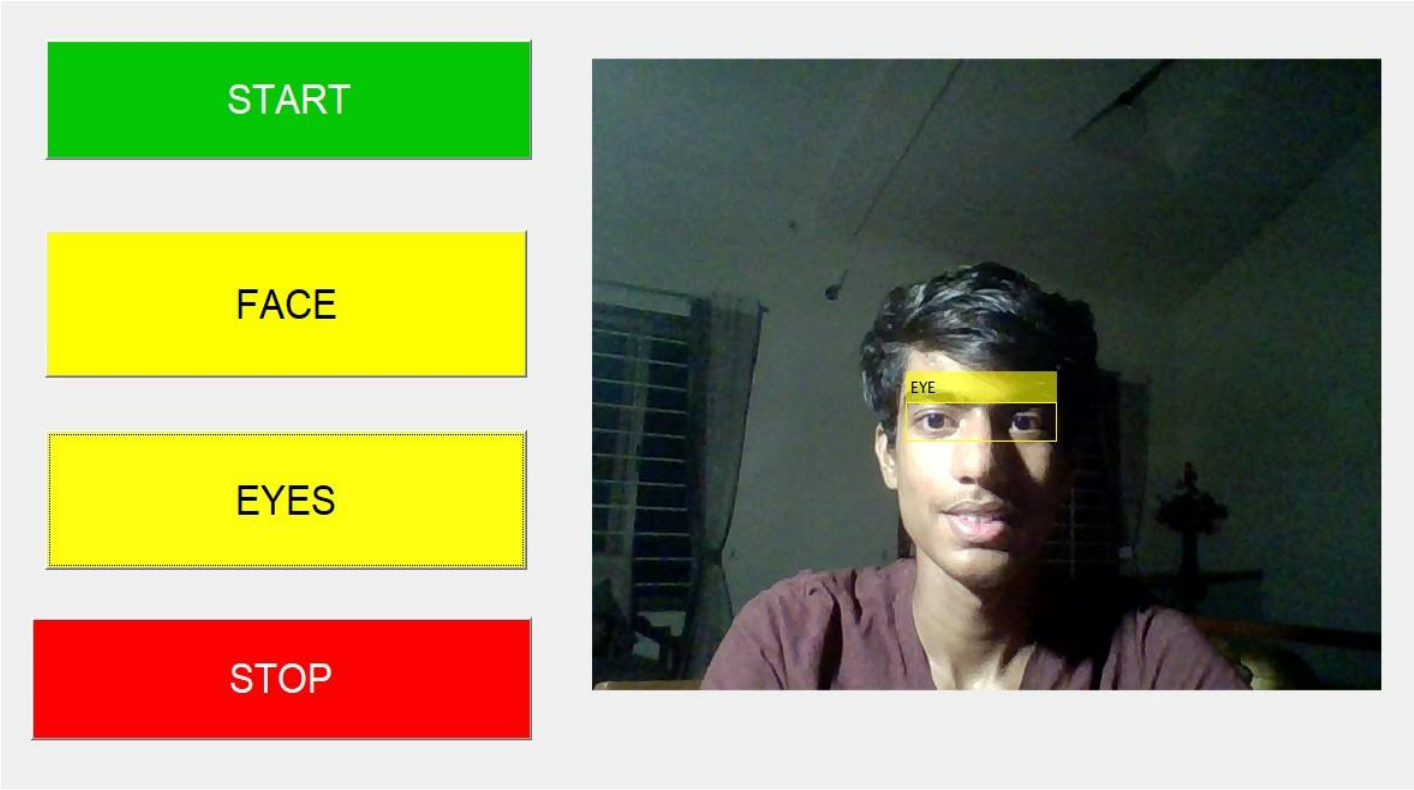
PROGRAM

```
function varargout = testing(varargin)

gui_Singleton = 1;
gui_State = struct('gui_Name',       mfilename, ...
                   'gui_Singleton',  gui_Singleton, ...
                   'gui_OpeningFcn', @testing_OpeningFcn, ...
                   'gui_OutputFcn',  @testing_OutputFcn, ...
                   'gui_LayoutFcn',  [] , ...
                   'gui_Callback',   []);
if nargin && ischar(varargin{1})
    gui_State.gui_Callback = str2func(varargin{1});
end

if nargout
    [varargout{1:nargout}] = gui_mainfcn(gui_State, varargin{:});
else
    gui_mainfcn(gui_State, varargin{:});
end

function testing_OpeningFcn(hObject, eventdata, handles, varargin)
handles.output = hObject;
axes(handles.axes1);
imshow('face_recognition.jpg');
axis off;
guidata(hObject, handles);

function varargout = testing_OutputFcn(hObject, eventdata, handles)
varargout{1} = handles.output;


% --- Executes on button press in start.
function start_Callback(hObject, eventdata, handles)
% hObject    handle to start (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
handles.vid = videoinput('winvideo' , 1,'YUY2_640X480');
%preview(handles.vid);
guidata(hObject, handles);

% --- Executes on button press in face.
function face_Callback(hObject, eventdata, handles)
% hObject    handle to face (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
%handles.vid = videoinput('winvideo' , 1, 'YUY2_640X480');
triggerconfig(handles.vid ,'manual');
set(handles.vid, 'TriggerRepeat',inf);
set(handles.vid, 'FramesPerTrigger',1);
handles.vid.ReturnedColorspace = 'rgb';
 handles.vid.Timeout = 5;
start(handles.vid);
while(1)
facedetector = vision.CascadeObjectDetector;
trigger(handles.vid);
```

```
handles.im = getdata(handles.vid, 1);
bbox = step(facedetector, handles.im);
hello = insertObjectAnnotation(handles.im,'rectangle',bbox,'FACE');
imshow(hello);
end
guidata(hObject, handles);


% --- Executes on button press in stop.
function stop_Callback(hObject, eventdata, handles)
% hObject    handle to stop (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
handles.output = hObject;
stop(handles.vid),clear handles.vid %, ,delete(handles.vid)
guidata(hObject, handles);


% --- Executes on button press in eyes.
function eyes_Callback(hObject, eventdata, handles)
% hObject    handle to eyes (see GCBO)
% eventdata  reserved - to be defined in a future version of MATLAB
% handles    structure with handles and user data (see GUIDATA)
triggerconfig(handles.vid ,'manual');
set(handles.vid, 'TriggerRepeat',inf);
set(handles.vid, 'FramesPerTrigger',1);
handles.vid.ReturnedColorspace = 'rgb';
 handles.vid.Timeout = 2;
start(handles.vid);
while(1)
bodyDetector = vision.CascadeObjectDetector('EyePairBig');
bodyDetector.MinSize = [11 45];
%bodyDetector.ScaleFactor = 1.05;
trigger(handles.vid);
handles.im = getdata(handles.vid, 1);
bbox = step(bodyDetector, handles.im);
hello = insertObjectAnnotation(handles.im,'rectangle',bbox,'EYE');
imshow(hello);
end
guidata(hObject, handles);
```

OUTPUT SCREENSHOTS





CONCLUSION

Object detection and tracking are important in many computer vision applications, including activity recognition, automotive safety and surveillance. Presented here is an face detection using MATLAB system that can detect not only a human face but also eyes.

Face detection is the process of identifying one or more human faces in images or videos. It plays an important part in many biometric, security and surveillance systems, as well as image and video indexing systems.

In this project we have learnt that it is easy and simple task for humans to identify faces than computers. In this field there is a large variation caused by expressions or facial appearance. We have used Graphic User Interface(GUI) which allows us to choose between detection of face and eyes.

We have also learnt how to make a GUI and commands used to create a GUI. We have also used different functions and commands in this project for example **imaqhwinfo('winvideo')** this command is used for identifying the camera and we can find its specification, **nargin nargout function** this function is number of input and output arguments, **imshow** is used to show image and many more.

We have also used a add-on i.e Image Acquisition Toolbox Support Package for OS Generic Video Interface enables you to acquire images and video. We have also learnt about Viola-Jones algorithm which we have used in this project. The Viola-Jones algorithm is a widely used mechanism for object detection. The main property of this algorithm is that training is slow, but detection is fast.

We have also used a function i.e **vision.CascadeObjectDetector.** The cascade object detector uses the Viola-Jones algorithm to detect people's faces, eyes.

We have made a real-time face detector with a GUI in this project we can also detect faces from a photo as well the program for the same is as follows :-

```
faceDetector = vision.CascadeObjectDetector;
I = imread('face_recognition.jpg');
bboxes = faceDetector(I);
IFaces = insertObjectAnnotation(I,'rectangle',bboxes,'Face');
figure
imshow(IFaces)
title('Detected faces');
```