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FOUNDATIONS OF ARTIFICIAL INTELLIGENCE

CSE 1014

J COMPONENT

AUTOMATIC SELFIE USING PYTHON

SUBMITTED TO

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ABSTRACT

AI which stands for artificial intelligence refers to systems or machines that mimic human intelligence to perform tasks and can iteratively improve themselves based on the information they collect. AI manifests in a number of forms. At its simplest form, artificial intelligence is a field, which combines computer science and robust datasets, to enable problem-solving. It also encompasses sub-fields of machine learning and deep learning, which are frequently mentioned in conjunction with artificial intelligence. These disciplines are comprised of AI algorithms which seek to create expert systems which make predictions or classifications based on input data. Today, a lot of hype still surrounds AI development, which is expected of any new emerging technology in the market. The technology that we are using is computer vision. This AI technology enables computers and systems to derive meaningful information from digital images, videos and other visual inputs, and based on those inputs, it can take action. This ability to provide recommendations distinguishes it from image recognition tasks. Powered by convolutional neural networks, computer vision has applications within photo tagging in social media, radiology imaging in healthcare, and self-driving cars within the automotive industry. Our project is automatic selfie using python. Get beautiful selfies automatically captured when you smile. Python Project to automatically detect and capture selfies. Everyone loves a smiling picture, so we will develop a project which will capture images every time you smile.

CONTENTS

INTRODUCTION

DESIGN

RESULTS & DISCUSSION

CONCLUSION & FUTURE WORK

REFERENCES

INTRODUCTION

In these modern days everyone addicted to taking selfies. To take a selfie we need to click the button to capture the image which results in blurry image in most of the time.

So, to solve this problem we did a project which captures selfie automatically after smiling hence which puts an end to blurry images.

Everyone loves a smiling picture, so we will develop a project which will capture images every time you smile. we will use OpenCV library.

To implement this project, we need to know the following:

1. Basic concepts of Python
2. OpenCV basics.
3. Haar cascade

DESIGN

In this project we used basic python, haar cascade and open cv.

OpenCV

It is an open-source library for computer vision, with a focus on real-time applications. It focuses mainly on video capture/processing, image processing, and analysis (like face and object detection). It has many built-in functions and pre-trained models, so we don't have to worry about training and testing of algorithms.

It provides the facility to the machine to recognize the faces or objects. In this tutorial we will learn the concept of OpenCV using the Python programming language.

Our OpenCV tutorial includes all topics of Read and Save Image, Canny Edge Detection, Template matching, Blob Detection, Contour, Mouse Event, Gaussian blur and so on.

Haar Cascade

Haar Cascade is an ML object detection algorithm used to identify objects in an image (treated as a matrix i.e., 2D grid here) or video.

In this algorithm, a cascade function is trained from a lot of positive and negative images which is then used to detect objects in other images. It can be trained to identify almost any object. In this project, we will be using these pre-trained files.

The algorithm has four steps:

1. Haar Feature Selection
2. Creating Integral Images
3. Adaboost Training
4. Cascading Classifiers

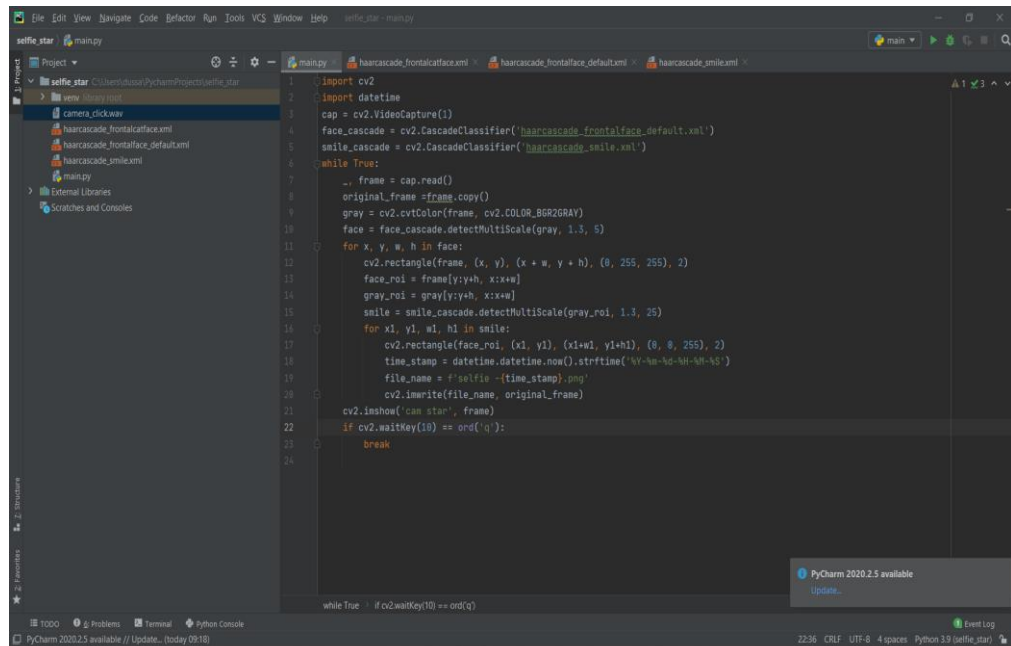
Process Overview:

1. Use the facial landmark detector in dlib to get the mouth coordinates
2. Set up a smile threshold, using a mouth aspect ratio (MAR)
3. Access the webcam to setup a live stream
4. Capture the image
5. Save the image
6. Close the cam feed

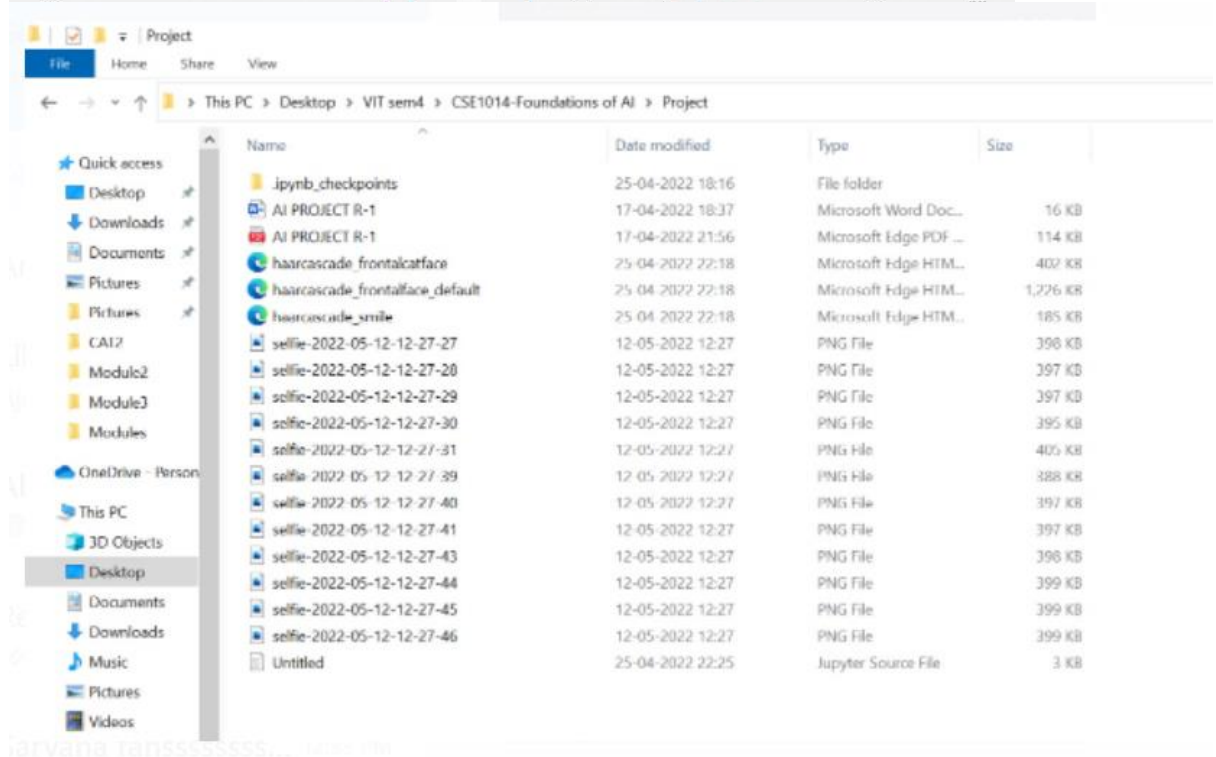
Libraries required:

1. NumPy: Used for fast matrix calculations and manipulations.
2. dlib: Library containing the facial landmarks.
3. Cv2: The Open CV library used for image manipulation and saving.
4. SciPy. Spatial: Used to calculate the Euclidean distance between facial points.
5. Imutils: Library to access video stream

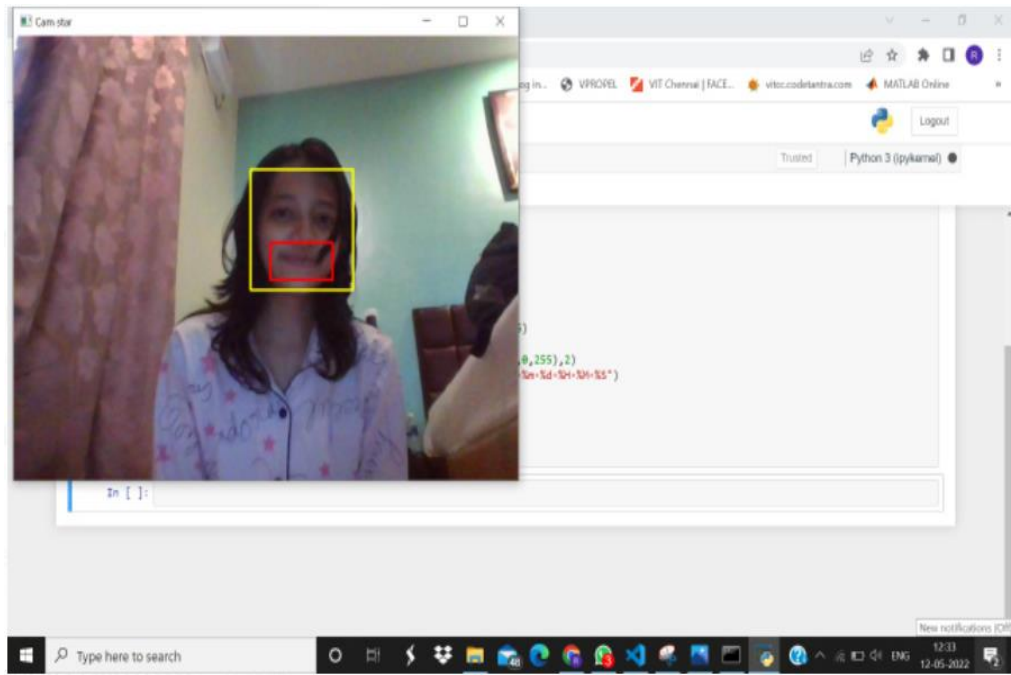
RESULTS & DISCUSSION



```
1 import cv2
2 import datetime
3 cap = cv2.VideoCapture(0)
4 face_cascade = cv2.CascadeClassifier('haarcascade_frontalface_default.xml')
5 smile_cascade = cv2.CascadeClassifier('haarcascade_smile.xml')
6 while True:
7     _, frame = cap.read()
8     original_frame = frame.copy()
9     gray = cv2.cvtColor(frame, cv2.COLOR_BGR2GRAY)
10    face = face_cascade.detectMultiScale(gray, 1.3, 5)
11    for x, y, w, h in face:
12        cv2.rectangle(frame, (x, y), (x + w, y + h), (0, 255, 255), 2)
13        face_roi = frame[y:y+h, x:x+w]
14        gray_roi = gray[y:y+h, x:x+w]
15        smile = smile_cascade.detectMultiScale(gray_roi, 1.3, 25)
16        for x1, y1, w1, h1 in smile:
17            cv2.rectangle(face_roi, (x1, y1), (x1+w1, y1+h1), (0, 0, 255), 2)
18            time_stamp = datetime.datetime.now().strftime('%Y-%m-%d-%H-%M-%S')
19            file_name = f'selfie-{time_stamp}.png'
20            cv2.imwrite(file_name, original_frame)
21    cv2.imshow('can star', frame)
22    if cv2.waitKey(10) == ord('q'):
23        break
24
```



Name	Date modified	Type	Size
.ipynb_checkpoints	25-04-2022 18:16	File folder	
AI PROJECT R-1	17-04-2022 18:37	Microsoft Word Doc...	16 KB
AI PROJECT R-1	17-04-2022 21:56	Microsoft Edge PDF ...	114 KB
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haarcascade_frontalface_default	25-04-2022 22:18	Microsoft Edge HTML...	1,226 KB
haarcascade_smile	25-04-2022 22:18	Microsoft Edge HTML...	185 KB
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CONCLUSION & FUTURE WORK

As discussed earlier using python, OpenCV and haar cascade we developed a project which detect and captures a selfie automatically.

Future work

We want to add one more feature to our project which gives break between selfies. After capturing one selfie it needs to stop for 2 sec and again it needs to start capturing selfie automatically after smiling. This feature is to stop the system from capturing unwanted selfies.

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REFERENCES

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