Green University of Bangladesh

Department of Computer Science and Engineering (CSE)

Faculty of Sciences and Engineering

Semester: (Spring, Year: 2022), B.Sc. in CSE (Day)

Course Title: Algorithom LAB

Course Code: CSE 206

Lab Project Name : Emotion Recognitions System

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Submission Date : **14 May 2022**

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Lab Report Status

Marks: Signature:

Comments: Date:

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Chapter 1
Introduction

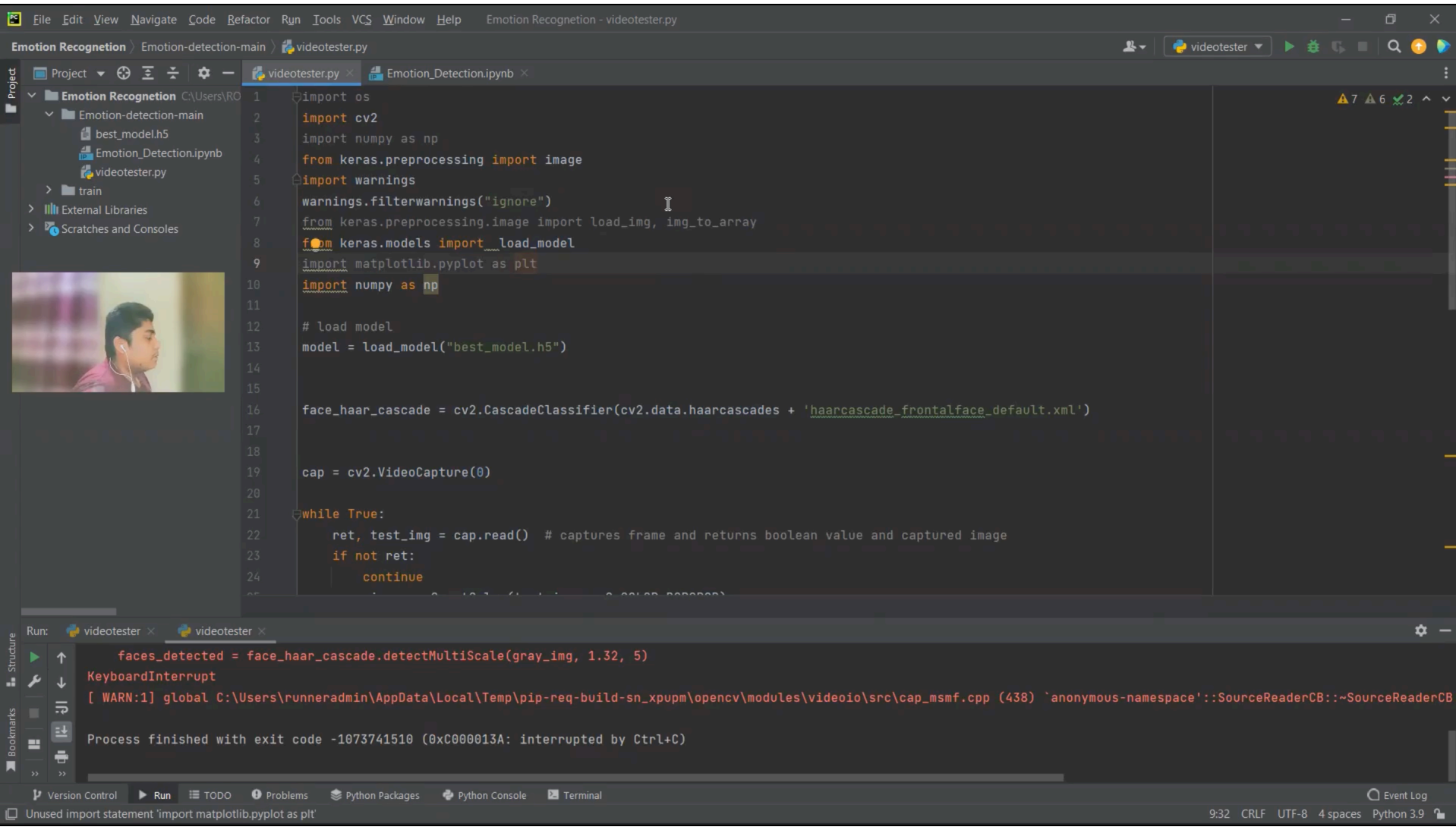
1.1 Introduction: Extracting and validating emotional cues through analysis of users' facial expressions is of high importance for improving the level of interaction in man machine communication systems. Extraction of appropriate facial features and consequent recognition of the user's emotional state that can be robust to facial expression variations among different users is the topic of this paper. Facial animation parameters (FAPs) defined according to the ISO MPEG-4 standard are extracted by a robust facial analysis system, accompanied by appropriate confidence measures of the estimation accuracy. A novel neurofuzzy system is then created, based on rules that have been defined through analysis of FAP variations both at the discrete emotional space, as well as in the 2D continuous activation–evaluation one. The neurofuzzy system allows for further learning and adaptation to specific users' facial expression characteristics, measured though FAP estimation in real life application of the system, using analysis by clustering of the obtained FAP values.

1.2 Design Goals: I made a system that can detect emotion via live video . And as a programming language we have used python. We will analyse the rest in place of implementation. ok now here we go .

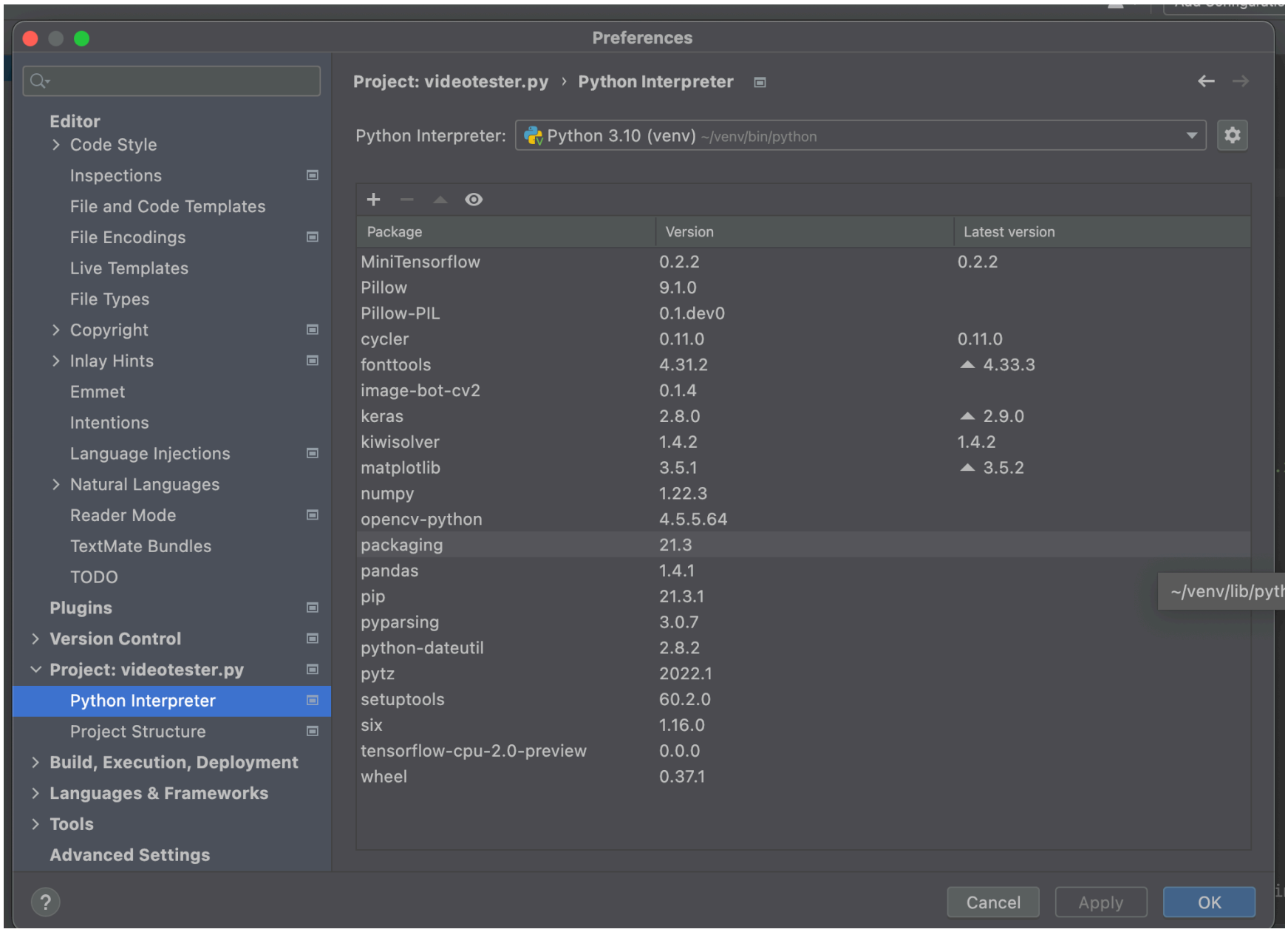
Chapter 2

2.0 Implementation of the Project

2.1 Design :



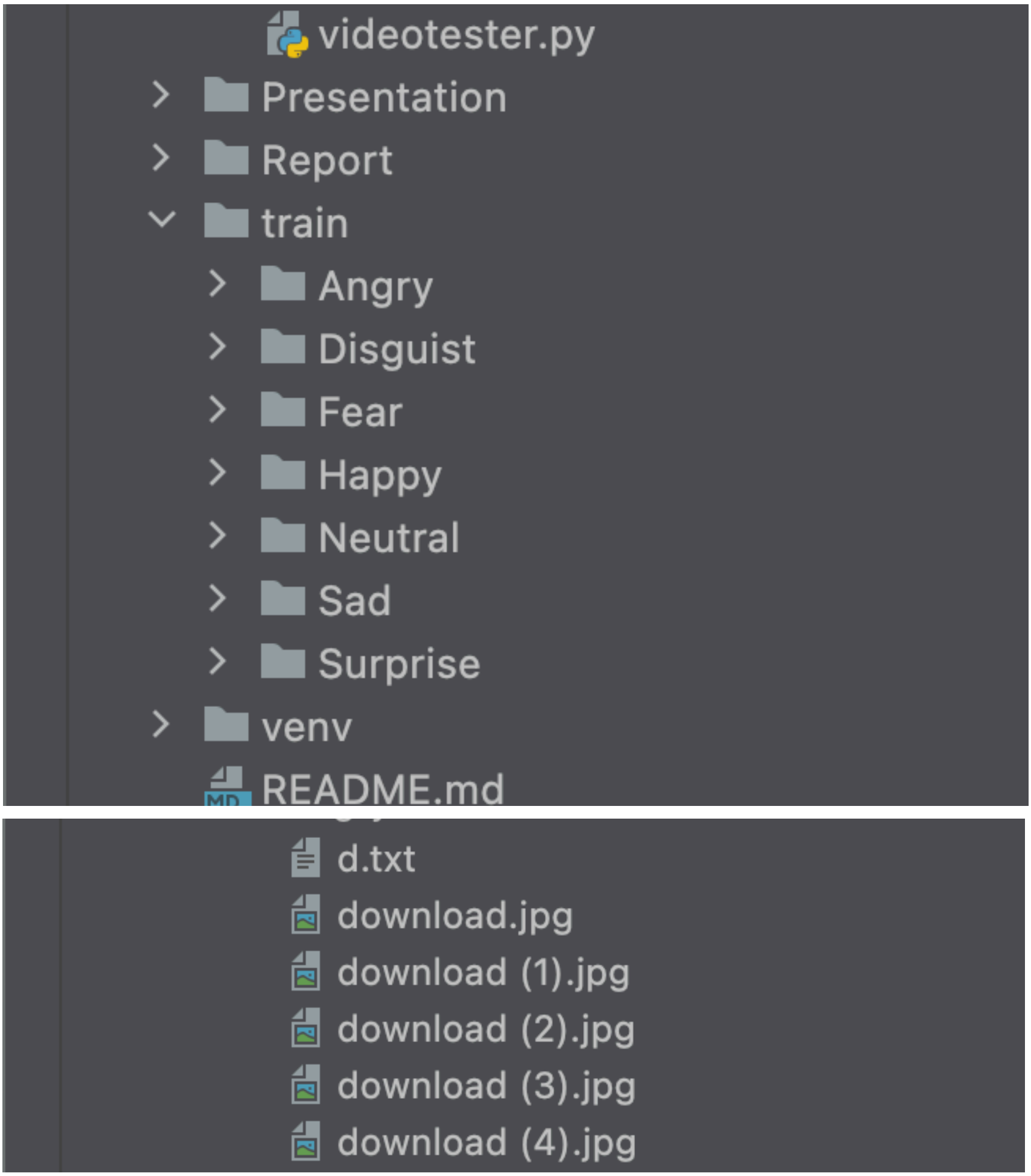
2.2 Development: Add dependency on my machine for start neural engine.



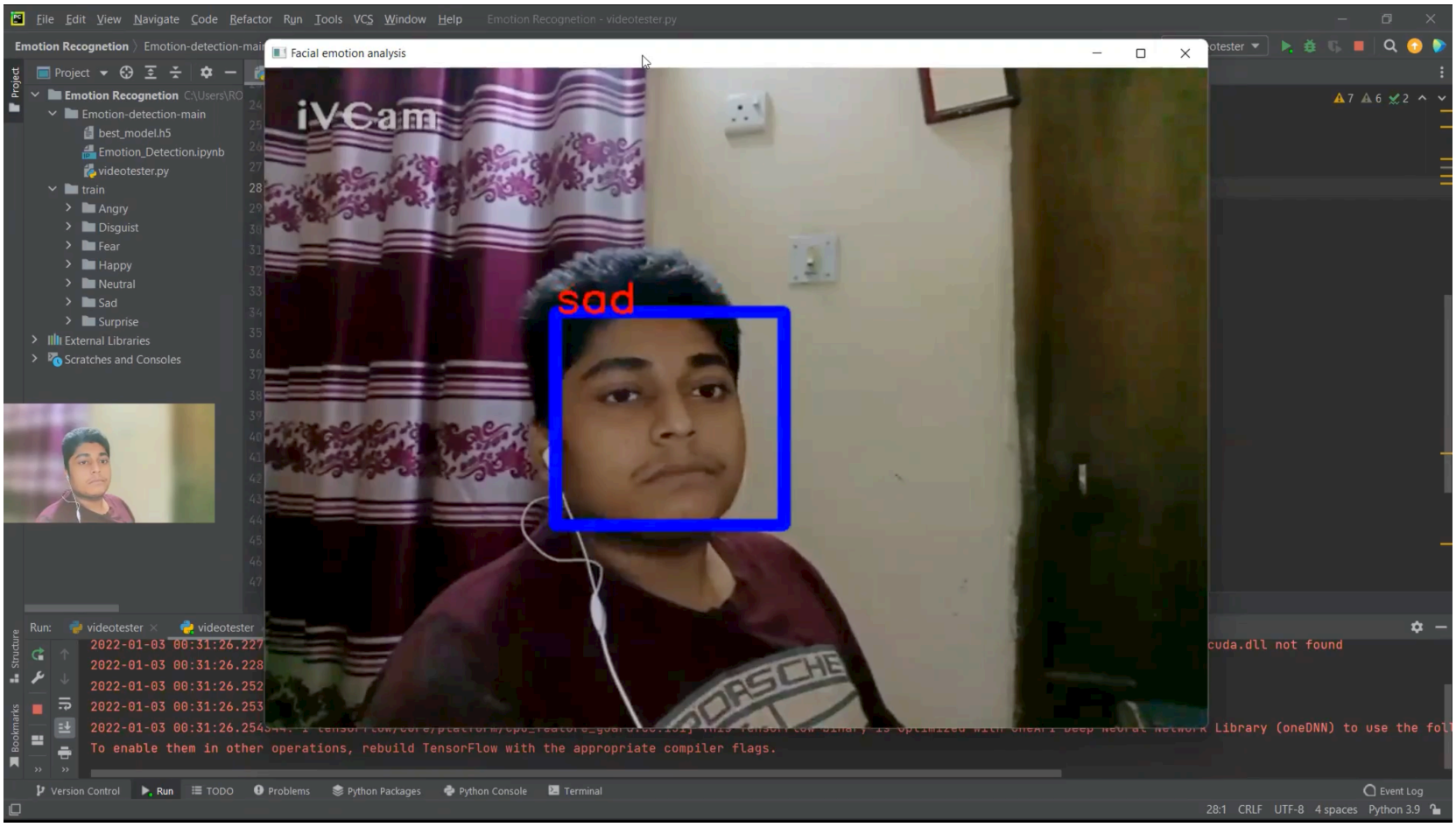
Write code :

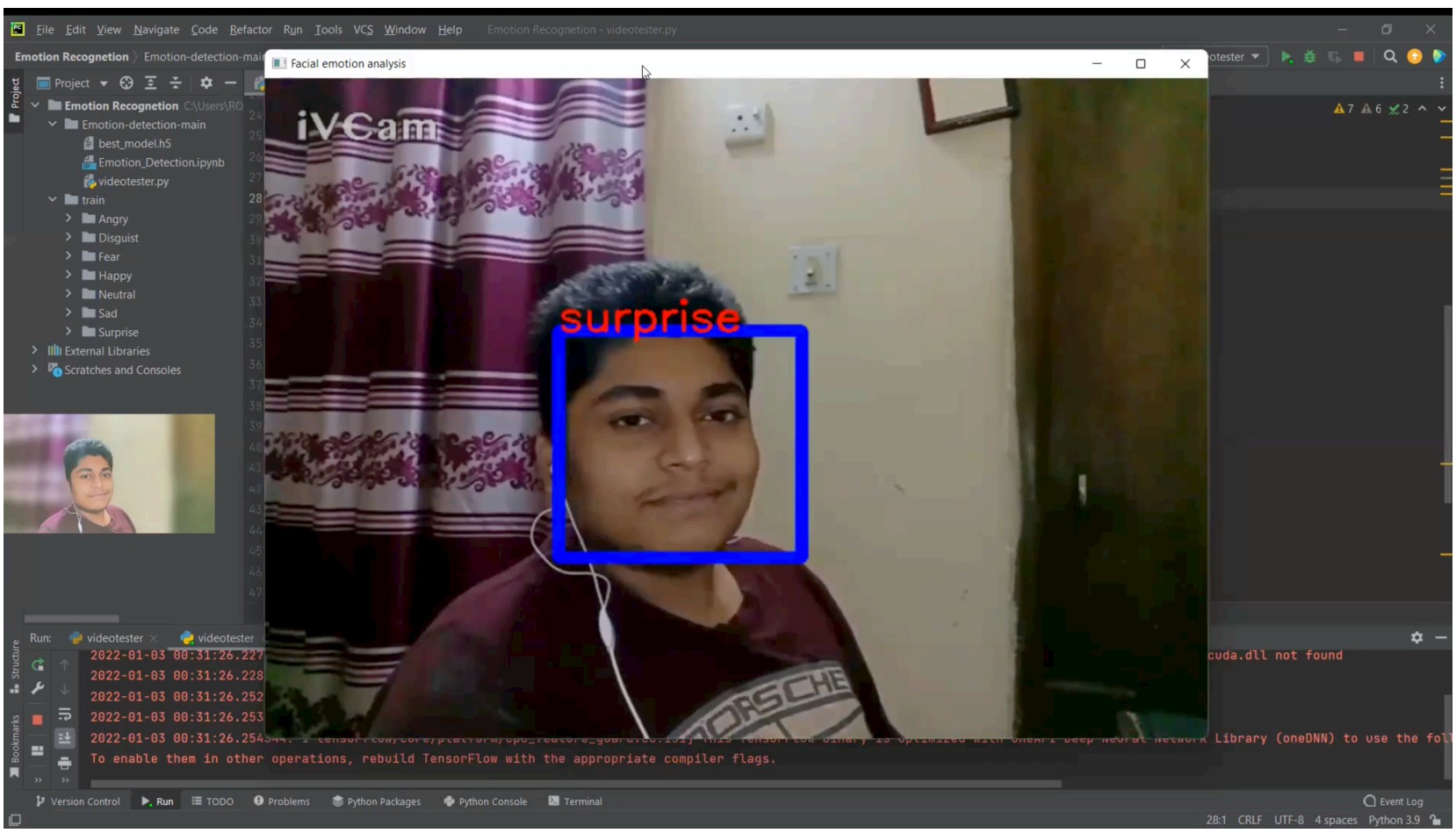
```
import os
import cv2
from keras.preprocessing import image
import warnings
warnings.filterwarnings("ignore")
from keras.preprocessing.image import load_img, img_to_array
from keras.models import  load_model
import matplotlib.pyplot as plt
import numpy as np

# load model
model = load_model("best_model.h5")


face_haar_cascade = cv2.CascadeClassifier(cv2.data.haarcascades +
'haarcascade_frontalface_default.xml')


cap = cv2.VideoCapture(0)

while True:
    ret, test_img = cap.read()  # captures frame and returns boolean value and captured
image
    if not ret:
        continue
    gray_img = cv2.cvtColor(test_img, cv2.COLOR_BGR2RGB)

    faces_detected = face_haar_cascade.detectMultiScale(gray_img, 1.32, 5)
    for (x, y, w, h) in faces_detected:
        cv2.rectangle(test_img, (x, y), (x + w, y + h), (255, 0, 0), thickness=7)
        roi_gray = gray_img[y:y + w, x:x + h]  # cropping region of interest i.e. face area
from  image
        roi_gray = cv2.resize(roi_gray, (224, 224))
        img_pixels = image.img_to_array(roi_gray)
        img_pixels = np.expand_dims(img_pixels, axis=0)
        img_pixels /= 255

        predictions = model.predict(img_pixels)

        max_index = np.argmax(predictions[0])

        emotions = ('angry', 'disgust', 'fear', 'happy', 'sad', 'surprise', 'neutral')
        predicted_emotion = emotions[max_index]

        cv2.putText(test_img, predicted_emotion, (int(x), int(y)),
cv2.FONT_HERSHEY_SIMPLEX, 1, (0, 0, 255), 2)

    resized_img = cv2.resize(test_img, (1000, 700))
    cv2.imshow('Facial emotion analysis ', resized_img)

    if cv2.waitKey(10) == ord('q'):
        break

cap.release()
cv2.destroyAllWindows
```

Setup dataset and start train:

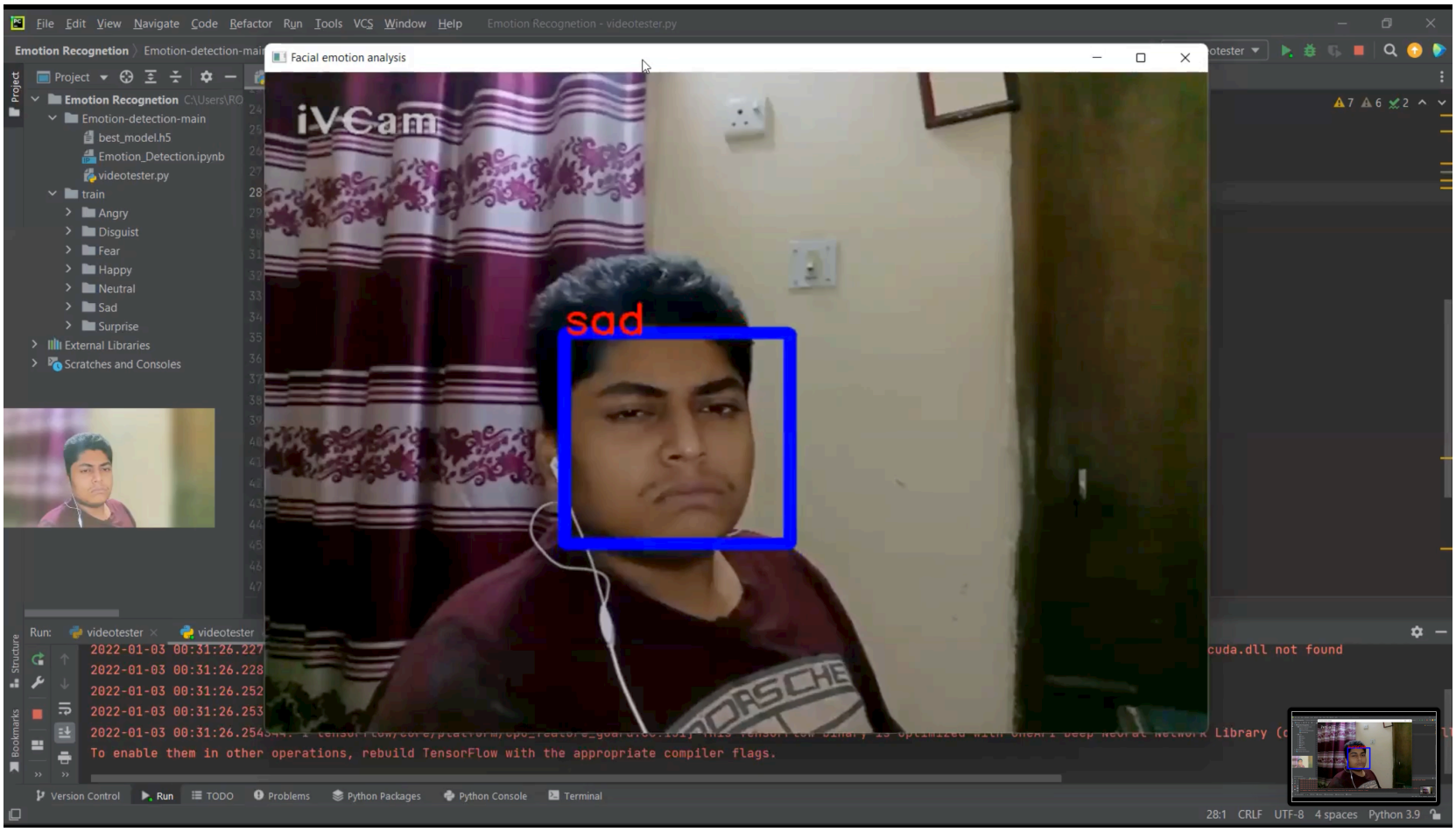


Emotion Check





System ok


Facial emotion analysis
iVCam
sad
Emotion Recognetion
Emotion-detection-main
best_model.h5
Emotion_Detection.ipynb
videotester.py
train
Angry
Disguist
Fear
Happy
Neutral
Sad
Surprise
External Libraries
Scratches and Consoles
To enable them in other operations, rebuild TensorFlow with the appropriate compiler flags.

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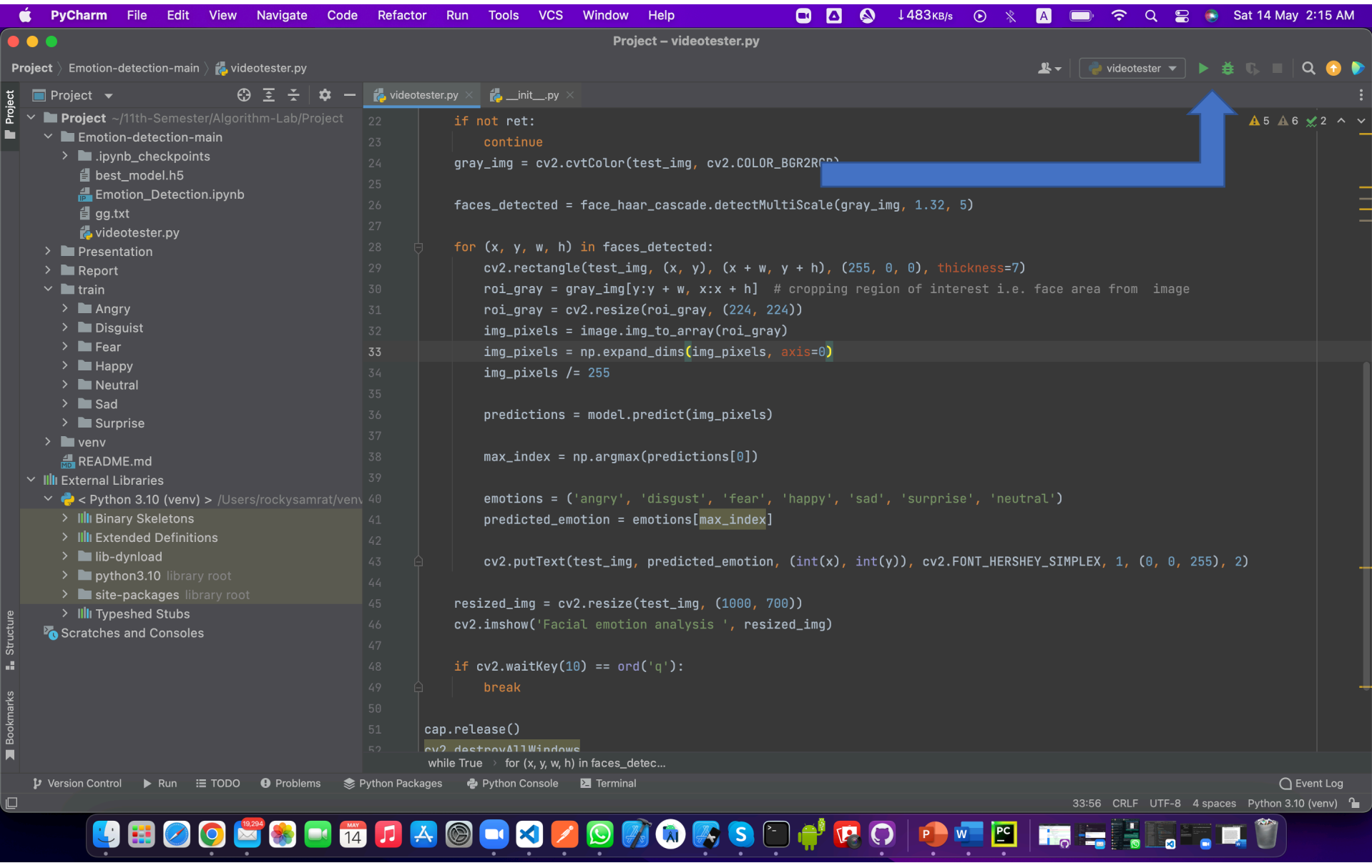
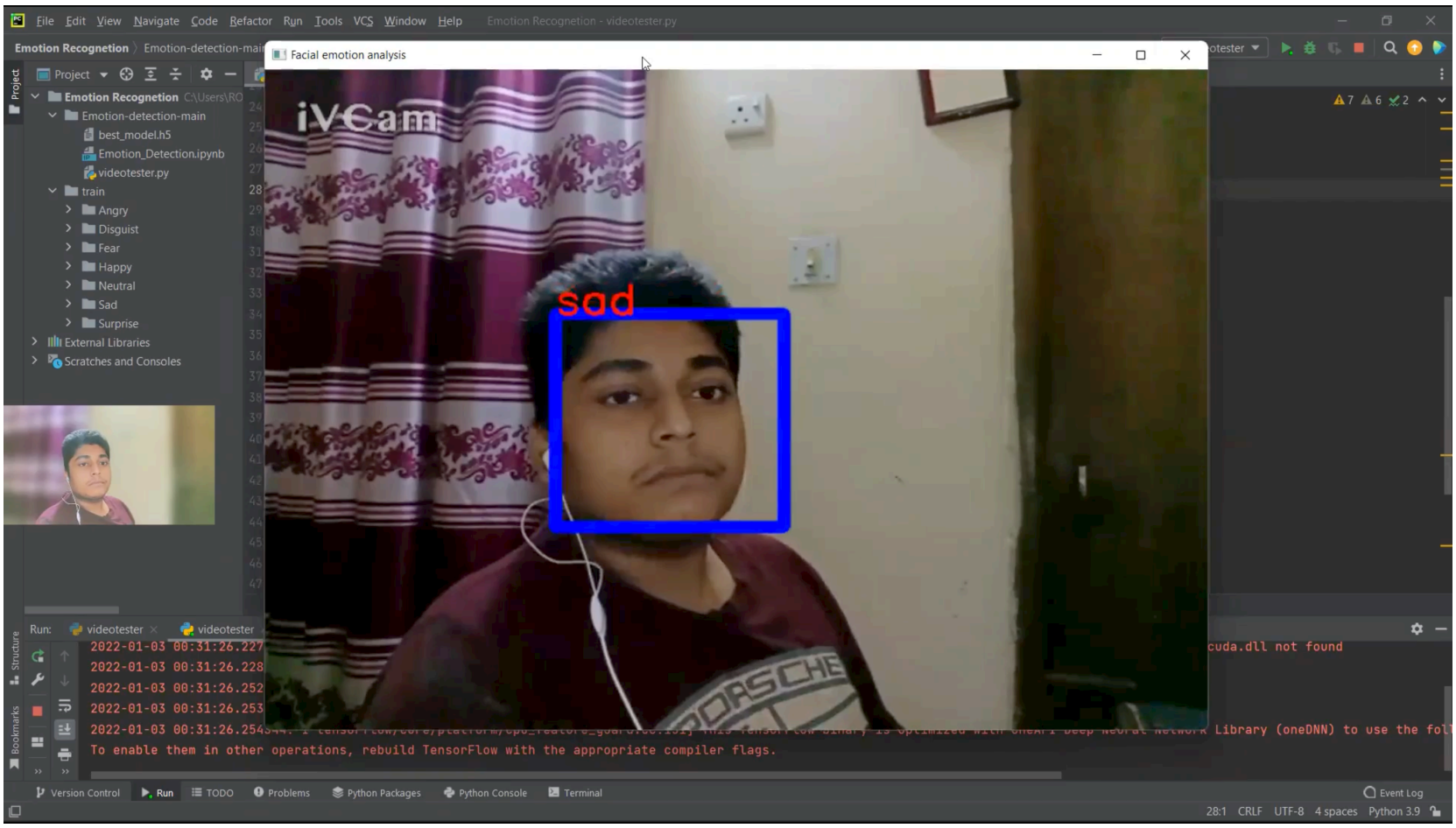
Chapter 3
Performance Evaluation

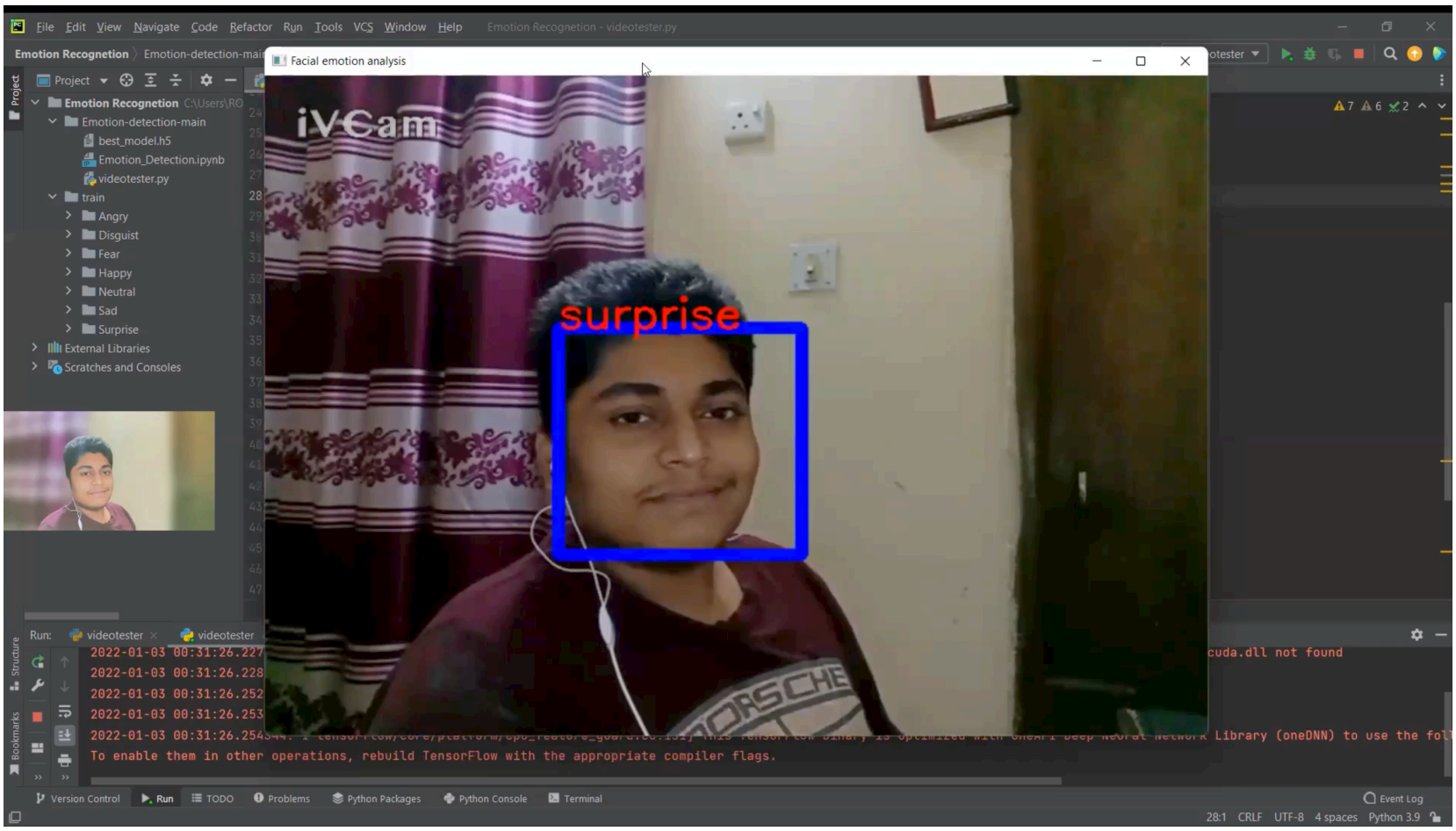
3.1 Simulation Environment

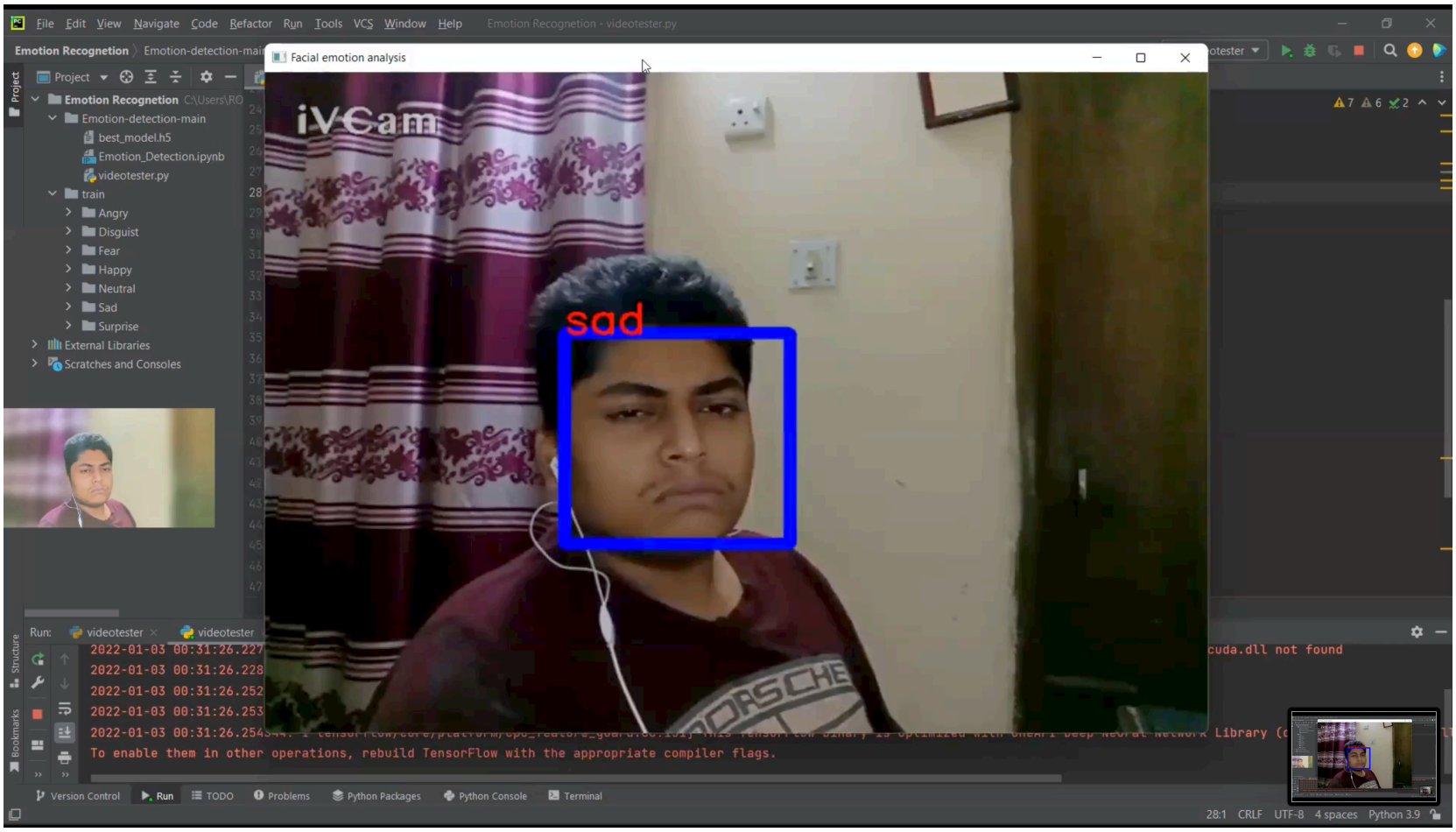


To simulation click on Start then will be showed like that snapshot and check Diagnostics Realtime status

3.2 Results and Discussions:



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2022-01-03 00:31:26.228
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Version Control
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Chapter 4
Conclusion

4.1 Introduction: This project has really been faithful and informative. It has made us learn and understand the many trivial concepts of python Language. As we have used pycharm as a GUI it provides various controls, such as image processing , k-means, neural network to build a user friendly system.

4.2 Practical Implications: In this project, we outline the approach we have developed to construct an emotion-recognising system. It is based on guidance from psychological studies of emotion, as well as from the nature of emotion in its interaction with attention. A neural network architecture is constructed to be able to handle the fusion of different modalities (facial features, prosody and lexical content in speech). Results from the network are given and their implications discussed, as are implications for future direction for the research.

4.2 Scope of Future Work

The main issue in the project was time. To improve performance you can very the dropout, number of dense layers and activation functions. We also used transfer learning with a CNN called VGG which is a pre-trained convolutional neural network for image classification. Our accuracy using pixels was about 50%, this increased when instead of using pixel values, we used the distances between the facial landmarks. However we wanted models that would be even more accurate, so we decided to use CNNs.

We will fix this in future .

References

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14/05/2022 , 02:30AM , Shuvobroto Biswas

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[4] Dataset , Edureka

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