

COMPUTER VISION MINI PROJECT

Facial Expression Analysis from Videos

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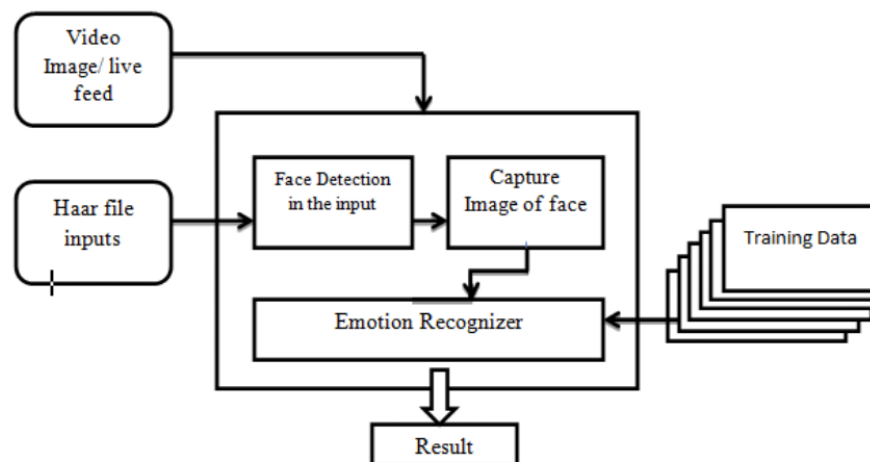
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Sentiment Analysis on Haar cascade faces

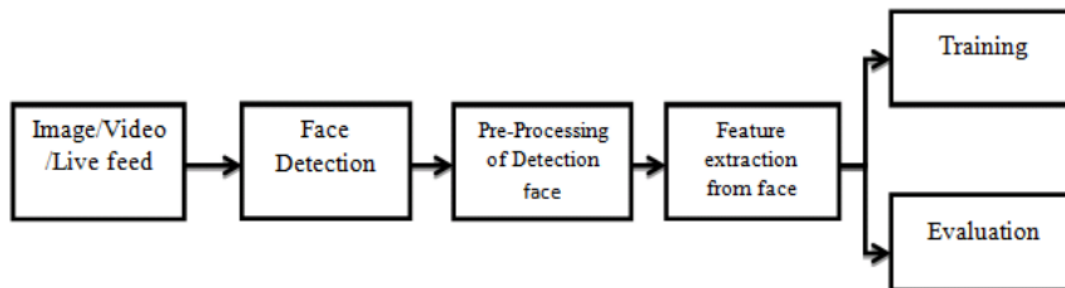
- The sentimental analysis is a process of extracting human feelings from data . It is an application of natural language processing , computational linguistics, text analysis. Its basic idea is to classify human emotions in different moods such as happy, sad, neutral, etc.
- It uses the pattern of movement of both the lips and the eye shape that it takes during different feelings of human. It has a huge variety of applications because of its ability to extract insights from data sets and the social media. It will be using machine learning algorithms for the detection of emotions and it will be trained on the huge dataset with varying sample size.
- It will also use facial recognition to perform a specific analysis of a person after identifying their face.

Working

We first detect the face using OpenCV using the different Haar Cascades which are generally trained classifier. They are an effective way of detection and are available in Xml Form. The various Haar Cascades used here are stored in the **Haarcascade-frontal-face.xml** for face detection.



Implementation:



we see that the complete process of face recognition is covered in three stages

1. Face Detection

In this case machine uses the input as image and detect the face of the person. This face is used for feature extraction and these features are being processed. This processed image used for face recognition based on the images are stored in the data set.

2.Feature Extraction

A couple of properties basic to human face like:

The eye area is darker than the upper cheeks.

The nose connect area is brighter than the eyes.

Area and size: eyes, mouth, extension of nose

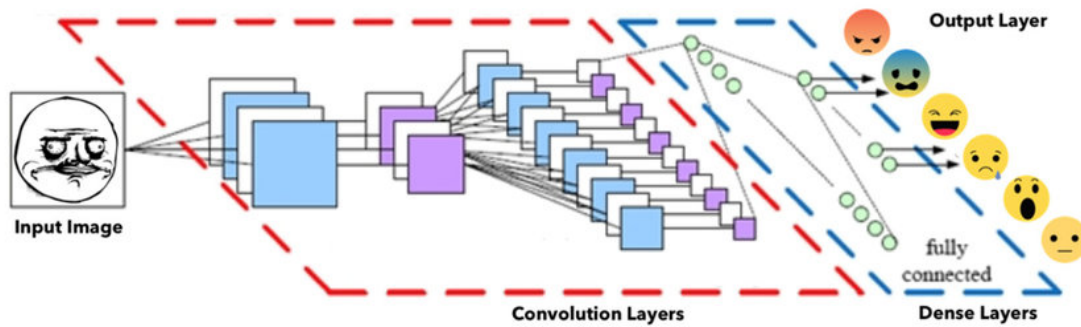
For this HAAR feature shown in below images are used. Each Feature is a single value obtained by subtracting sum of pixels under white rectangles from sum of pixels under black rectangles.



Training:

- We have **7 classes** : Angry, Disgust, Fear, Happy, Neutral, Sad, Surprise
- We are using Kaggle dataset of Facial Emotion(<https://www.kaggle.com/code/sagnik1511/face-emotion-recognition-with-efficientnetb2/data>)

- We are using alternative convolution and max pooling layers ,then flatten it and send it to the fully connected layers to predict the wanted output.
- We are saving the model in a file name **model.h5**



How to run the code:

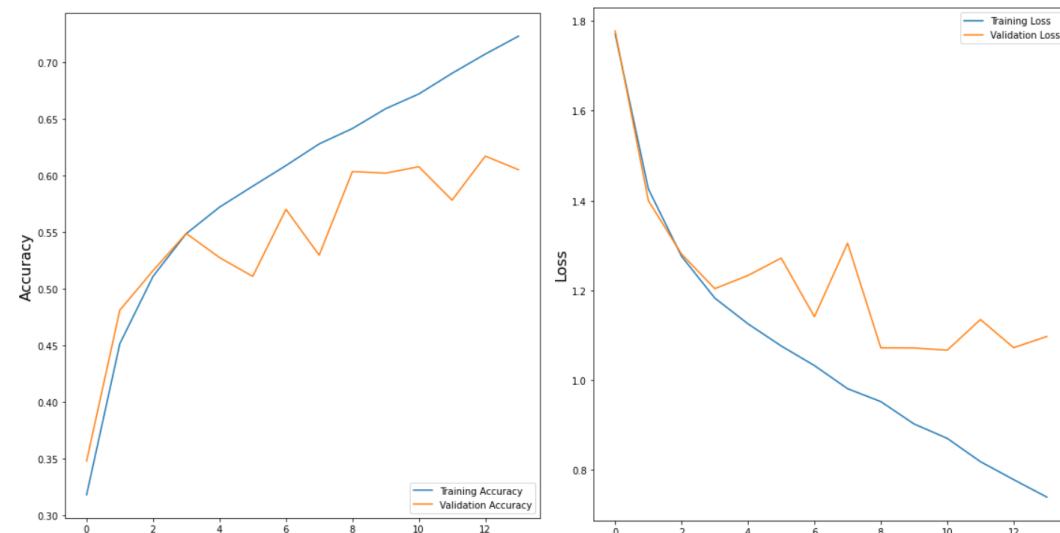
Download the zip.fie

We have **model.h5** fie, **Haarcascade-frontal-face.xml** and a **main.py** fie

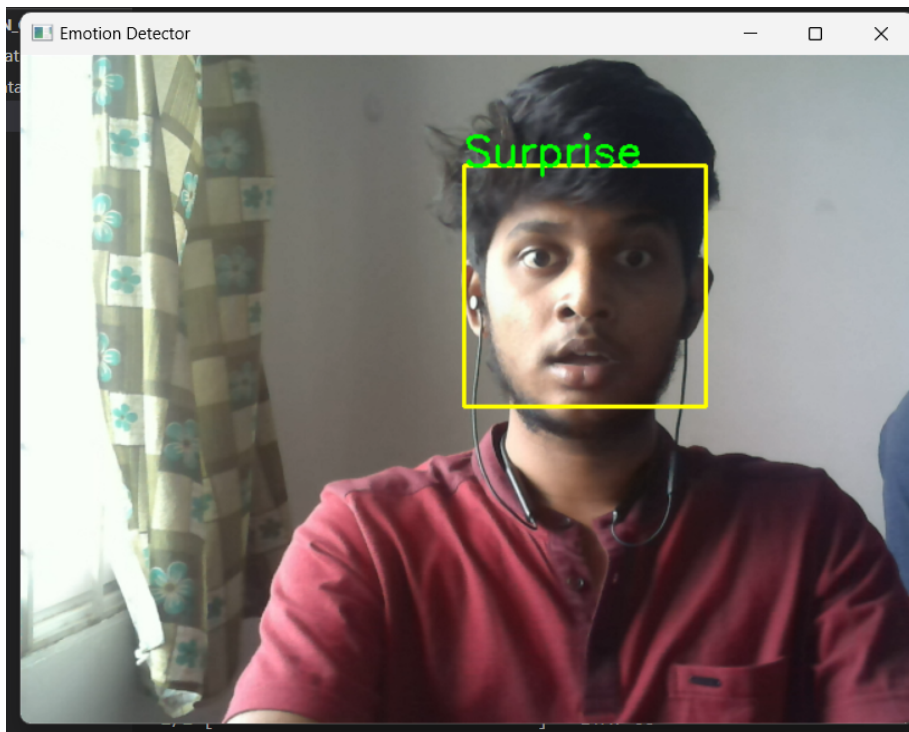
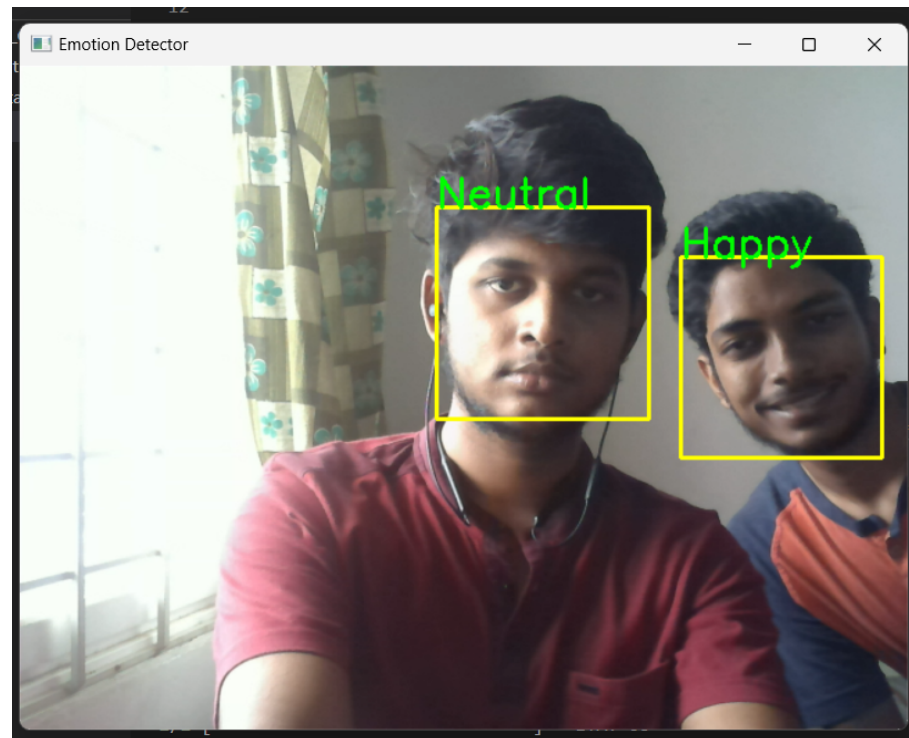
We run the main.py after importing the above 2 files

Results

Loss and Accuracy of the Model



Final outcome :



References

- Harpreet kaur ,Veenu Mangat,Nidhi: A Survey of Sentiment Analysis techniques ,UIET, Punjab university ,India.
- Faizan Ahmad , Aaima Najam and Zeeshan Ahmed: Image-based Face Detection and Recognition, Department of Computer Science.
- Irene Kotsia and Ioannis Pitas ,Senior Member ,IEEE.
- Open CV documentation :
<https://docs.opencv.org/2.4/doc/tutorials/tutorials.html>.