Face Recognition Technology using Machine Learning

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***Abstract*— Face recognition generation is an identity of someone. It collects the dataset (images) and the face recognition processes the dataset automatically. The paper introduces the face reputation of various attitude. This paper researches the dataset is input then it will detect the image and transforms the dataset. Then the image is crop to face only and it performs deep neural network. The representation will be in 1 unit. Then it forms to three phases. First is clustering and one of a kind is Similarity Detection and category. The photographs are processing the usage of OpenCV and quantifying faces using python libraries. The next step is embedded using pickle and recognizes the output and loading the faces embedding, loading the labels and training models. Then loading face recognizer.**

Keywords—OpenCV, Numpy, Tensor Flow, Keras

I.INTRODUCTION

The Technology uses the everyday in transaction, we using the online transaction or ATM card in atm counter, there are many fault are doing in there. The boom of electronic transactions are led to rapid and may use the accurate user identification and authentication. The Face Recognition technology may solve the problems by using atm pins and other security problems. And it has case of identical Twins. It is not acceptable for the technology. The technology uses biometrics. Biometrics method identifying with precise and measurable traits of a human being that can be used to apprehend an character or verify an character identification. It could degree in each Physiological and behavioral characteristics. Physiological is based on dataset is derived from direct measurement of a human body.

II.FACE RECOGNITION

The Face Recognition method is mainly for identifying the human being face. We recognizes the images using deep learning and it is embedding the output of dataset. it's far a manner of using software to determine the similarity among two face images with a view to compare a declare. The era is used for a spread of functions, from signing a consumer into their cellphone to looking for a particular character in a database of snap shots. When included with biometric protection structures (mainly, facial popularity ones), this form of era is what makes it possible to monitor and song humans in actual-time.

III.IMPLEMENTATION

Open the essence of images by OpenCV. Embed numeric operations in Python using NumPy. Come in flow of machine learning with TensorFlow. Dive deep into ocean of deep learning with Keras. The implementation is used in Anaconda Powershell prompt

A. Extraction

- First, we cropped out face from image and we extract features from it.
- A neural community takes an photo of the character's face as enter and output as a vector. It represents the most important features of a face.
- In machine learning, the vector are called embedding.

B. Opencv

PC imaginative and prescient is the maximum critical interesting and difficult obligations. It acts as probable a bridge between computer software and virtualization. It allows the computer software to understand.

Installation:

We can install OpenCV using pip or conda(for anaconda environment).

Using pip:

pip install opencv-python

Anaconda:

conda install -c conda-forge opencv

C. Some Common Mistakes

- Illumination: it will occur in light variations.
- Pose: It occur using head position and viewing the angle of face.

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- Occlusion: It will occur in cover the face using cap, mask etc.
- Expression: It is varying emotion in the face. Happy, Sad, Cry etc.
- Low Resolution: The minimum standard of the images is 16*16 size.
- Ageing: Increasing the age of the human being. The faces will changes to become old and skin will be wrinkles.
- Twins: Identical twins are difficult to identify using this technology

D. Import Features

Pickle is a python module. it's far used to serializing and de-serializing a python item.

Imutils is a characteristic for photograph processing like resizing, rotation, and translation.

Numpy is a working with array.

Argparse is a command-line parsing module in python wellknown library

IV.IMPLEMENTATION INPUT

A. Extracting feaatures from face

```
(base) PS D:\Seminar\PyPower_face-recognition> python extract_embeddings.py --dataset
 dataset --embeddings output/PyPower_embed.pickle --detector face_detection_model --e
mbedding-model openface_nn4.small2.v1.t7
[INFO] loading face detector...
[INFO] loading face recognizer...
[INFO] quantifying faces...
[INFO] processing image 1/30
[INFO] processing image 2/30
[INFO] processing image 3/30
[INFO] processing image 4/30
[INFO] processing image 5/30
[INFO] processing image 6/30
[INFO] processing image 7/30
[INFO] processing image 8/30
[INFO] processing image 9/30
[INFO] processing image 10/30
[INFO] processing image 11/30
[INFO] processing image 12/30
[INFO] processing image 13/30
[INFO] processing image 14/30
[INFO] processing image 15/30
[INFO] processing image 16/30
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[INFO] processing image 23/30
[INFO] processing image 24/30
[INFO] processing image 25/30
[INFO] processing image 26/30
[INFO] processing image 27/30
[INFO] processing image 28/30
[INFO] processing image 29/30
[INFO] processing image 30/30
[INFO] serializing 30 encodings...
(base) PS D:\Seminar\PyPower_face-recognition>
```

First, we need get a dataset and make sure images are stored in folder and each folder containing images of just one person.

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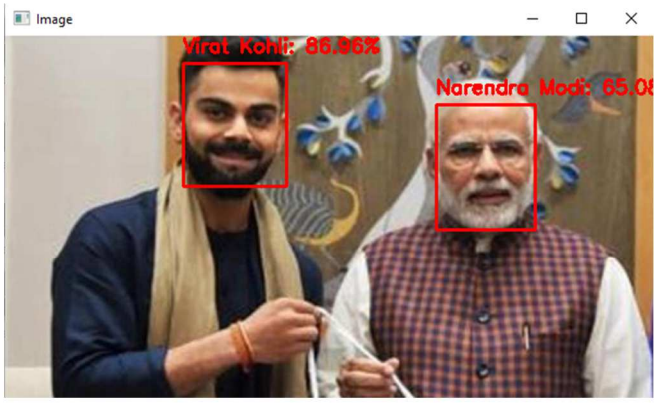
B. Embeddings output

```
[INFO] processing image 29/30
[INFO] processing image 30/30                python train_model.py --embeddi
put/PyPower_embed.pickle --recognizer output/PyPower_recognizer.pickle --le ou
Power_label.picklear\PyPower_face-recognition>
[INFO] loading face embeddings...
[INFO] encoding labels...
[INFO] training model...
(base) PS D:\Seminar\PyPower_face-recognition> python recognize.py --detector
tection_model --embedding-model openface_nn4.small2.v1.t7 --recognizer output/
_recognizer.pickle --le output/PyPower_label.pickle --image images/test1.jpg
[INFO] loading face detector...
[INFO] loading face recognizer...
```

In machine learning, the vector are called embedding, The face as input and output is vector and serializing the input images.

C. Output



CONCLUSION

Face Recognition Technology is a very costly using application.

REFERENCES

1. 1.ELECTRONICS FOR YOU: - PART 1 APRIL 2001
2. PART 2 MAY 2001
3. 2. ELECTRONICS WORLD: - DECEMBER 2002
4. 3. IEEE INTELLIGENT SYSTEMS - MAY/JUNE 2003
5. 4. MODERN TELEVISION ENGINEERING- GALATI R.R
6. 5.WWW.FACEREG.COM
7. 6.WWW.IMAGESTECHNOLOGY.COM
8. 7. WWW.IEE.COM

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