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Face Recognition using Machine Learning Algorithms

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Abstract: The interest in face recognition theories and algorithms has been soaring during the last several years, whereas unmanned and driverless cars, criminal identification, building access control, and video surveillance are a few examples of practical applications that are gaining popularity among sectors. Essentially, the problem of identifying a person based on their facial picture is what we propose in this work for a machine learning-based face recognition system. The project's main goal is to create a face recognition programme that will enable users to recognise people from their photographs. By selecting the person's photograph, training the system, and then using it, the user may perform face recognition.

Keywords: person identification; facial recognition systems

1. INTRODUCTION

A machine learning-based tool called a face recognition system may identify suspects by examining images. The project's main goal is to create a face recognition programme that will enable users to recognise people from their photographs. A face recognition system's job is to identify people by their facial images. In the past two decades, it has greatly increased in popularity, mostly as a result of new techniques created and the excellent quality of the most recent movies and photographs. A face recognition system is created utilising a machine learning technique like the Haar cascade classifier and LBPH (Local Binary Pattern Histogram). A face recognition system is created using three fundamental steps: facial recognition (2) pre-processing steps and (3) face recognition. The system's picture of a human face is recognised using the face detection stage. Preprocessing is a phase in the image-processing process that improves the picture data by reducing unintentional distortions or enhancing grayscale images. The final phase in the face recognition process involves preprocessing to identify the human face so that it may be compared to all the template photos in the dataset to determine the identification of the human face. The Face recognition may be utilised by user, by clicking the picture of the person and training the person image and then recognise the person.

2. PROPOSED WORK

They wanted to be able to recognise persons even in side profile or multi-angled images. This calls for effective frameworks that build the front face picture from a single side view face image. These are the steps: Face

Comparison And Result, Split Face, Mirror Image Generation, Feature Enhancement, And Extraction Of Face Features Five photos are listed in the final results with the best matching performance. This determines if the input and dataset images are the same. The authors' goal in this work was to increase the success rate of facial recognition for person identification. The angle of the face is crucial for successful outcomes. They said that their approach is helpful for creating 2D faces that improve percentage of matches to the reference image for human recognition from the side view of a human face.

The approaches put out by Rabia Jafri and Hamid R. Arabnia are designed for recognition purposes and make an effort to provide information on the most recent developments in facial recognition technology.

3. METHODOLOGY

This paper provides a detailed description of the suggested model. The figure below shows the major steps in facial recognition. In summary, there are three key stages in face detection.

A. Face Detection

B. Pre-processing Converting the image from BGR to RGB

C. Face Recognition

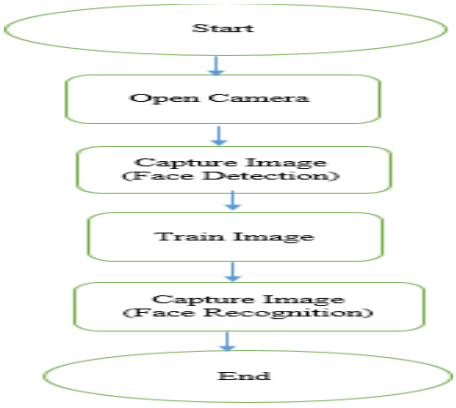


Figure 1. Work flow of proposed system

A. Face Detection

The Haar cascade classifier was used to identify the photos. The initial step in the face recognition system is the identification of human faces in a given image. This step's goal is to ascertain whether or not the incoming image contains human faces. To be able to Pre-processing processes are carried out to enhance the design of a future facial recognition system and make it more reliable. The human facial picture is detected using a variety of methods, including the Viola-Jones detector, the histogram of oriented gradient (HOG), the principal component analysis (PCA), and many more.

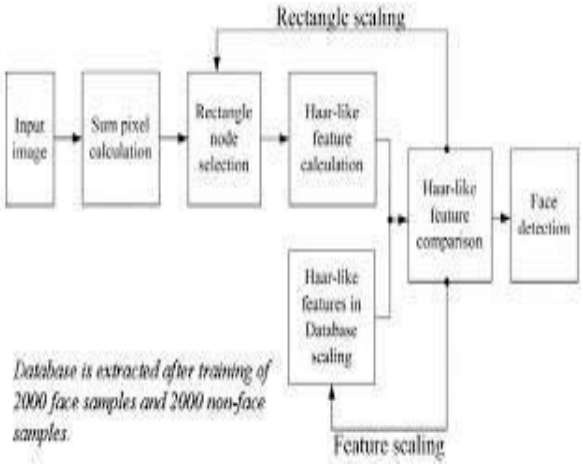


Figure 2. Architecture of Haar Cascade Classifier

A. Pre – Processing

Pre-processing's objectives are to increase picture quality and decrease complexity. Simply put, a gray scale image is one in which the only colours are various degrees of grey. Grey scale images are created by converting BGR into them because they require less data to be given for each pixel than any other type of colour image.

Before performing any picture pre- processing, we identify the person's face.

*Converting image from BGR to RGB

The collection comprises BGR (blue, green, and red) pictures, hence the images must be transformed to RGB (red, blue, and green). Matplotlib reads pictures in RGB format, whereas OpenCV often reads images in BGR format. The primary justification behind changing the picture from BGR to RGB is that different processing picture libraries have distinct pixel orderings.

We must convert the image from BGR to RGB since Matplotlib will be used to read it. The conversion will be carried out correctly because our model functions well with RGB- format photos. Changing the photos from BGR to RGB makes it simpler to detect objects.

*Face Recognition

The face recognition stage takes into account the background features that were retrieved during the extraction of the feature step and compares them with recognised faces that are stored in a particular database. An LBPH machine learning algorithm has been utilised for face identification. Face recognition comprises two basic phases: identification and verification. Identification is the first phase. A test face is compared against a collection of faces during identification to determine which match is more likely. A test face is compared to a known face in the database during the verification process to determine whether or not the person's face is recognised..

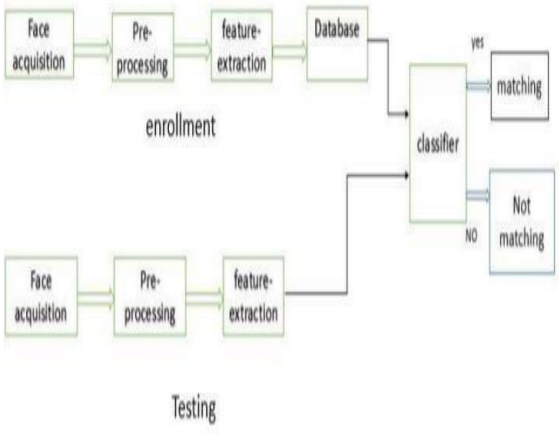


Figure 3. Architecture of LBPH algorithm

.3. DATASET

We are making use of a dataset for recognition. The identical ID, followed by the individual's name and the number of each photograph, must appear on all photos of the same person. A collection of around 51 photos of each individual was collected and used to create a face recognition algorithm.

Figure 4. Training Dataset

4. EXPERIMENTAL RESULTS

Each image in the face database of this project has a unique ID number. Prepare the face dataset first by taking pictures of them using a webcam, Afterward, train the retrieved picture, and save it as a.yml file. Then we identify the faces by comparing the face photographs to the face photos in the dataset. We may infer that the facial image issuccessfully identified since otherwise, it would not be and would show as Unknown.

Enter the person's ID number and name, activating the green button: When the camera is opened, it will recognise faces by displaying a blue rectangular box on the person's face image and taking up to 50 pictures.

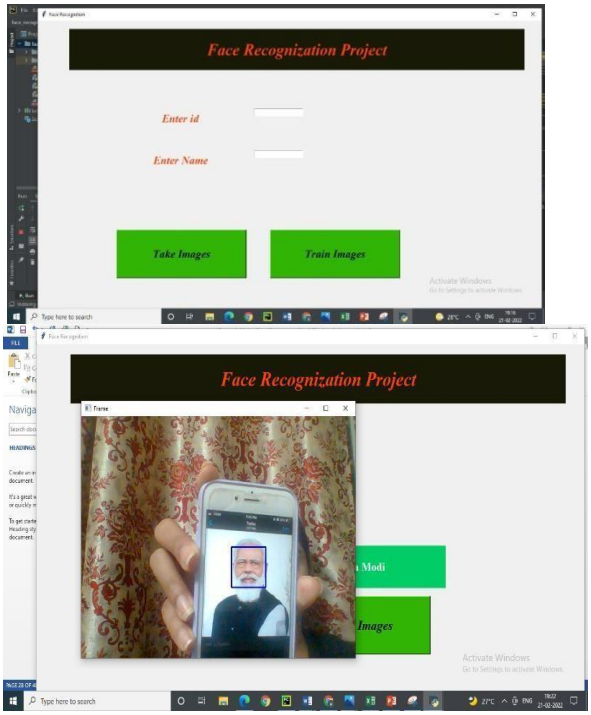
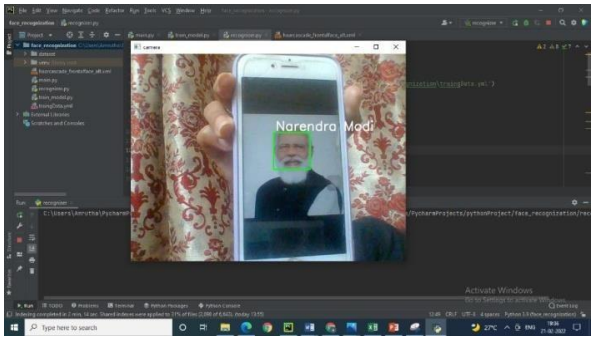


Figure 5 . Face detection

The LBPH technique is used in Figure 5 to compare the picture to the dataset images in the video frame.



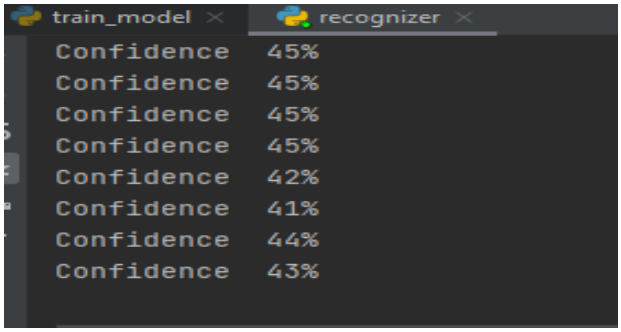
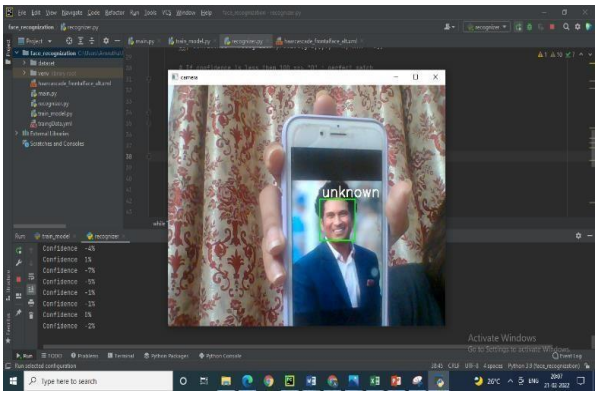


Figure 6. Trained Face recognition

In Figure 6 the trained face from the dataset is shown.



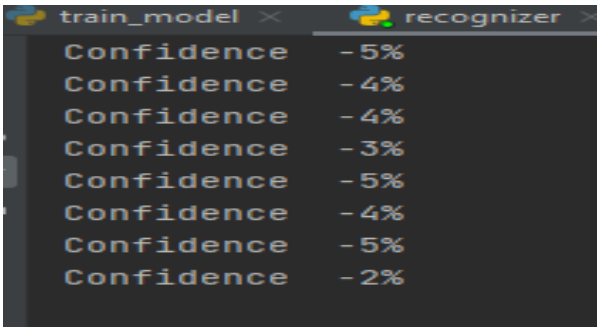


Figure 7. Non-Trained Image recognition

Figure 7 shows the Non-trained face from the dataset

5. CONCLUSION

For the face recognition in the proposed system, I employed local binary patterns at a low resolution. The representation of face detection, face pre-processing, and face recognition are its three main components.

Haar Cascade classifier is utilised for face recognition, and moreover, for training, this LBPH histogram produced a new outcome. Finally, we categorise input identified faces in comparison to the suggested DATASET. Then, we may examine if our algorithm identified a known individual or an unknown person.

6. REFERENCES

[1] Yassin Kortli, Maher Jridi, Ayman AlFalou and Mohamed Atri , Journal of Information Processing Systems, Vol.5,
No.2, June 2009

[2] Rohan Naik and Kalpesh Lad, February-2015, Survey: Face Recognition from Multi Angled Images

[3] XueMei Zhao, ChengBing Wei, A Real- time Face Recognition System Based on theImproved LBPH Algorithm, 2017 IEEE 2ndInternational Conference on Signal and Image Processing.

[4] Varun Garg, Kritika Garg, Face Recognition Using Haar Cascade Classifier,Journal ofEmerging Technologies and Innovative Research (JETIR) , December 2016, Volume 3, Issue 12.

[5] Hongshuai Zhang, Zhiyi Qu Liping, YuanGangLi, A Face Recognition Method Based on LBP Feature for CNN, 2017 IEEE 2nd Advanced Information Technology, Electronic and Automation Control Conference (IAEAC)

[6] Zheng Xiang, Hengliang Tan, WienlingYe. The excellent properties of dense gird-based HOG features on face recognition compare to gabor and LBP, 2018 volume issue 99.