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Recognition of Face Grounded on Aging Factors by exploiting artificial Intelligence Techniques

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ABSTRACT

We use face recognition everywhere now and then. It has three functions to recognize the face: (1) Screening 2) Acknowledgement. 3) First check, every face has to be detected. Second, he needs to immediately remember the face. Lastly, some further measures must be taken to ensure that the right individual can use them. The AI system collects the image from any captured images and analyses the captured image using the image stored in its database; the image is recognized by an individual with the AI system. Although the face is detected, the right person whose face is stored in the database because of certain changes in their face often doesn't recognize. We're going to make an ageing correction to eliminate these issues. The ageing correction is primarily applied to detect whether the face has changed.

Keywords: face recognition, aging correction, and artificial intelligence.

1. INTRODUCTION TO FACE RECOGNITION

A system for face recognition is a technology that allows an individual to recognize or validate an image source from a digital frame. Many methods function in facial recognition systems, but they work together by comparing selected facial characteristics from the given image with faces in the database. It is also known as a biometric application based on artificial intelligence that can identify a person individually through an analysis of patterns based on the face and face of a person [1].

The general type of computer application in mobile platforms and in other technology, such as robotics, has been widely utilized in recent times. Facial recognition has also recently become popular as a marketing and identification method. Advanced human computer interaction, video monitoring, automated image indexing and video archive, among others, also include other applications.

The most famous in this digital world nowadays has been face recognition. In several multimedia areas, face recognition is almost used. Face recognition is often used primarily for

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defense. Therefore, it is vital that the user communicate with the machine. The human image plays a major role in Face Recognition, although the human face won't exactly be after a few years that facial recognition causes the biggest problem. The face recognition normally retrieves the human face from photographs, videos or surveillance footages, etc. The great difficulty in face recognition remains ageing invariants [2].

Cross-cutting ageing is a growing issue for recognition of the face, particularly when age compensation applications are required, for example for passport authentication, observation and detection of multiple inscriptions where people are not available or try to conceal their personality. There may be a substantial age gap in these applications between the image of the query and those stored in the database and it may not be feasible for people to update their database with recent images[3]. The patterns of ageing depend on time: the visual status in a given age affects all older faces, but does not affect the younger.

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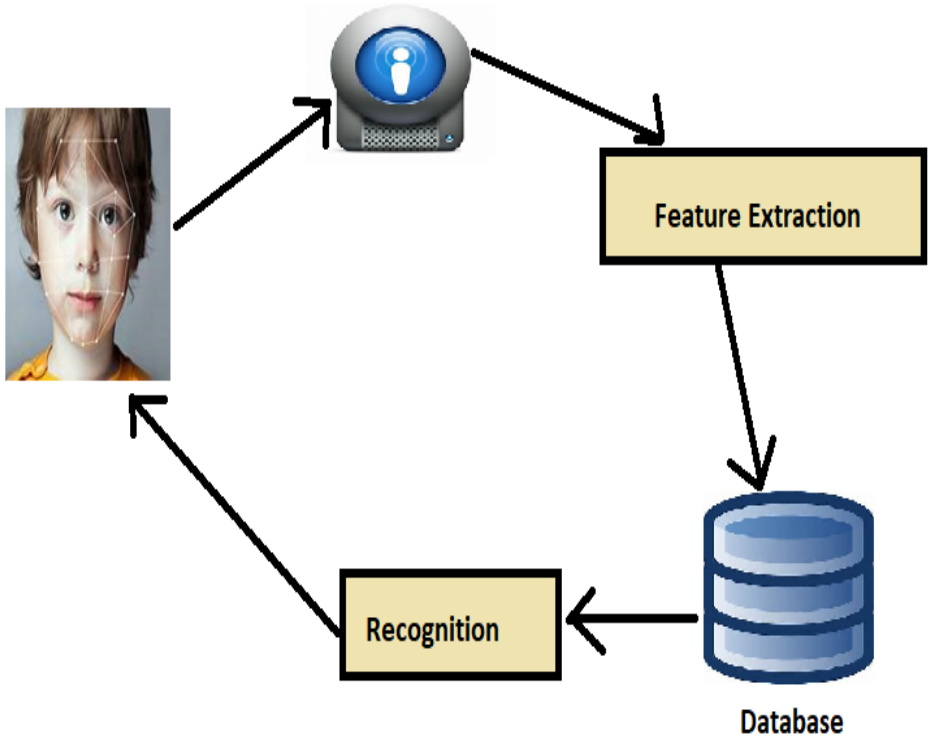

Figure 1.1 Face Recognition Steps

Normally, the method of face-recognition collects pictures from photographs, footages and in real time. The face will be placed in the corresponding directory after the image is gathered and the image from the folder is trained and our face recognized. After a few years, we recognized our face with old data which sometimes did not recognize our face. The data set that we have saved [4] is not changed. We can change the way we store new datasets in our cell phones.

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However, it's not always possible. We may make no adjustments at all times, regardless of whether we recognize the face in the passport office.

2. ROLE OF ARTIFICIAL INTELLIGENCE

Some face recognition algorithms recognize facial characteristics by extracting landmarks or characteristics from a picture of the face. The relative location, size and shape of the eyes, nose, cheekbones and jaw can be analyzed by an algorithm, for example. These features are used to scan for images with the same characteristics. Other algorithms normalize the image gallery and compact the face data, just save the image data that is useful to recognize the face. A sample image is compared to the figure. One of the earliest successes is based on the model matching technique used for a certain outstanding facet, which provides a type of compressed face representation [5].

Recognition algorithms can be divided into two main approaches: geometric which examines distinctive features or photometric approaches that distribute an image in values and compare values with templates in order to remove differences [6]. Some of these algorithms are classified as two large categories: holistic and functional models. The former attempts to identify the whole face while the feature-based components such as features are subdivided and their respective spatial position is analyzed with respect to the other features.

3. PROPOSED RECOGNITION TECHNIQUE

The correction of ageing is primarily used to recognise the face. If we remember our face right now, we will not recognise our same face correctly in a few years due to ageing. With the aid of the openCV tool, ageing can be reversed. In many years, because of the folds, the wrinkles, the pickles and markings, our appearance improved. By using the ageing correction, this can be corrected.

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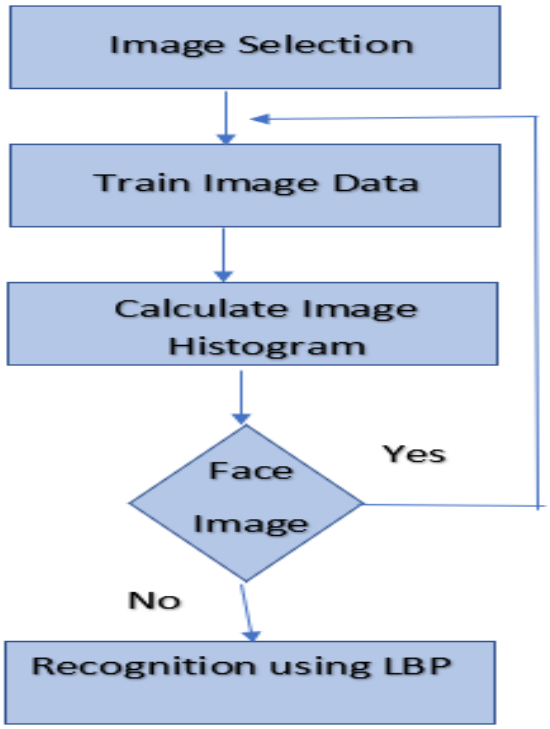

Figure 1.2 Flowchart of Face Recognition Process

a. Uniform pattern histogram

One of the simplest facial recognition algorithms [7] is the uniform pattern histogram. It is a very effective texture which marks the pixels of an image by threshing each pixel's area and considers the result to be a binary number. It is sturdy against the transformation of monotonous grayscale [8]. It characterizes each image in the data set locally, when we supply a new unknown image, we analyze it and compare the result with each of the pictures in the dataset. As we analyze the images, local patterns are characterized in every image area. The face can be easily recognized and detected [9].

Face recognition has three processes:

- Dataset Collection
- Train the dataset
- R

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ecognize i)

Dataset

Collection

We collect and store data from any video, pictures, photographs or etc. We cannot obtain the data from the camera's real-time recognition. This is an opens tool that stores the picture in grey. Even our dataset must be stored as a grey picture [10].

ii) Train the dataset

We must train the images in the dataset folder in our preparation. Our algorithm is only based on training to improve precision and reliability [11]. The photos trained are stored in the corresponding directory.

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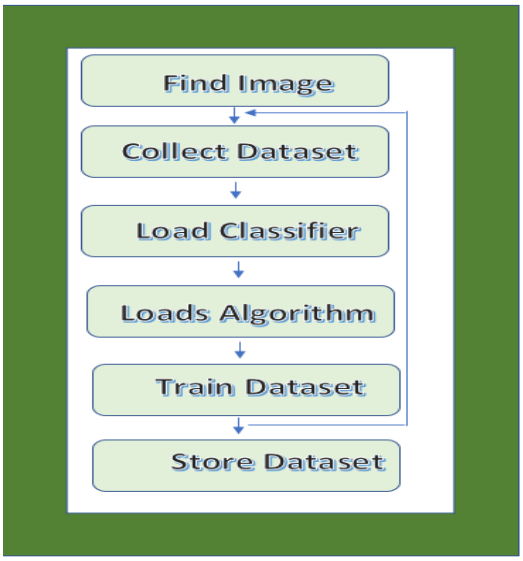

Figure 1.3 Image Training Process

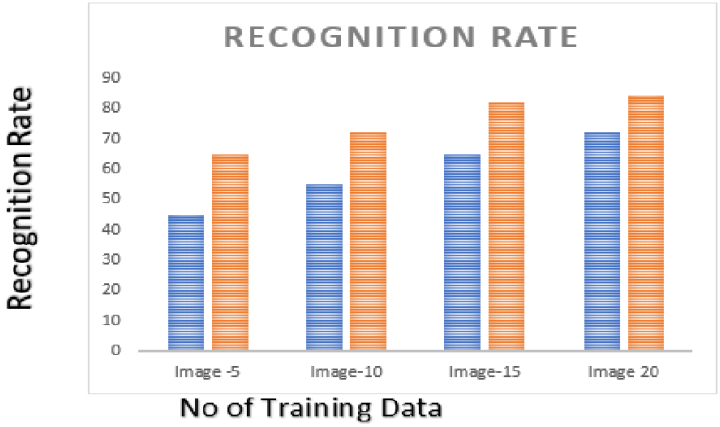

Figure 1.4 Rate of recognition

iii) Recognizing the face

Here, with the aid of our qualified photos, we recognise the face[12]. The face is recognised by the camera and then it goes to a directory where the images are processed, and if the two images are identical it reveals that the face is recognised otherwise it appears as an unknown person[13]. The face is recognised by the camera.

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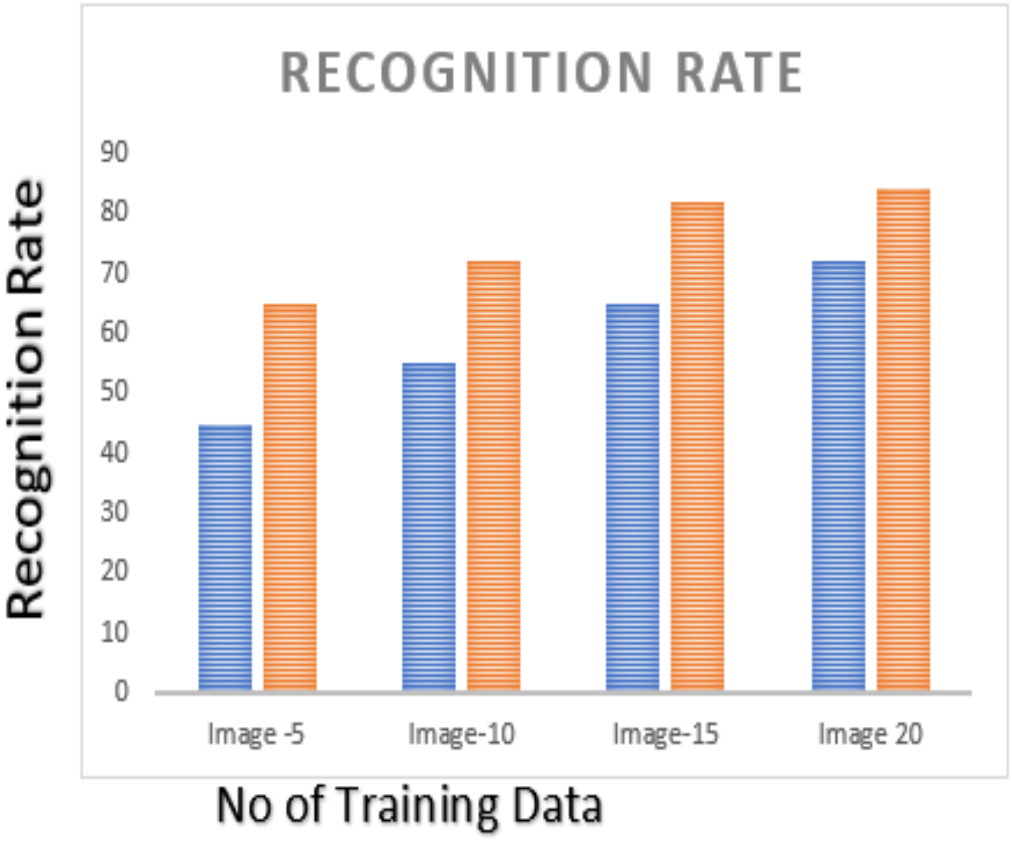

Figure 1.5 Rate of Face Recognition

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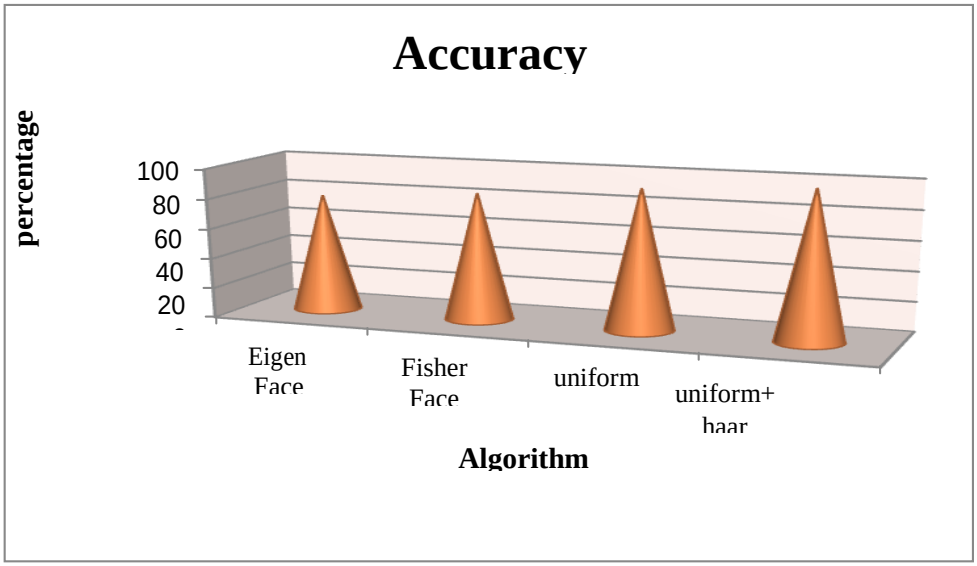

Figure 1.6 Accurate Rate of Various Algorithms

b. Face Recognition Based on Feature Extraction

Algorithm: Face recognition with feature extraction
Input: Images captured and store it in database **Output:** Face Recognition
Step 1: Begin #Capture the image #Tr ain the data set **Ste** **p 2:** t=0 #FOR each image X in the training image set #Initialize the pattern histogram 7. **Step 3:** H=0

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Step 4: for i_c to H
#i_c is the central pixel value
Step 3.1: t=0
Step 3.2: $A(b_{c,}y_{c)}=\sum^{x-1}_{x=0}2^{x}S(i_{b,}i_{c)}$
Step 3.3: H= $A(b_{c,}y_{c})$
Step 3.4: $N=S(i_{b}\text{-}i_{c)*2b}$
Step 3.5 : $Z(b_{c,}y_{c)}=\sum^{x-1}_{x=0}2^{x}D(i_{b,}i_{c)}$
Step 3.6: H1= $Z(b_{c,}y_{c)}$
Step 3.7: D=√t=t+1
END for
#Compare with test face image.
#If the image matches then the face is successfully recognized.
Step 5: End process.

4. RESULT AND DISCUSSION

In many algorithms, face recognition is normally working; however, the Uniform Pattern histogram algorithm is used here to correct ageing [14]. The known face is stored in this algorithm in a grey scale, which is mainly beneficial for the correction of ageing. Here OpenCV supports three algorithms: Own face, Fisherface and Histogram of the Uniform pattern. Uniform pattern histogram algorithm has the highest precision of these three algorithms. The Algorithm of Uniform Pattern Histograms is the best way to properly recognise the face [14].

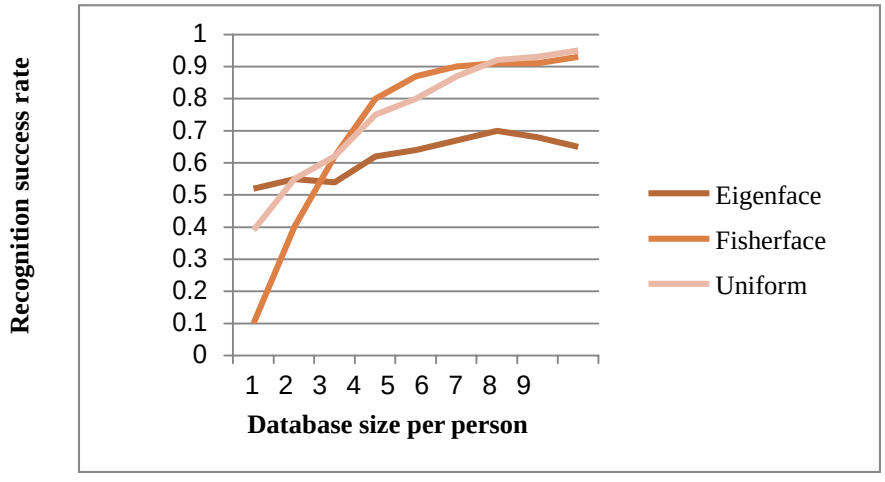

Figure 1.8 Performance analysis between computer vision algorithm

5. CONCLUSION

This paper offers a new approach to the success of an open source computer vision facial recognition system with uniform pattern histograms. Face recognition continues to be a daunting computer vision crisis. Due to its large requests in various fields, it has built an enormous notice contract in recent years. We use the OpenCV method here to recognise the face, which produces the best performance.

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