



A Review on Face Recognition Techniques

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Abstract: According to previous research review work, an abundance analysis of recognition techniques presented in study that exploits additional techniques and filters to achieve robust face recognition. In this review paper, Face recognition process is discussed and various stages involve in this process. Also the various face recognition techniques are reviewed in this paper. We have reviewed problem and related techniques to deploy illumination of light in the face images as it employ to various combination in face representation. These techniques have more effective in terms to the future research work that will consider improving state of arts techniques for the face recognition system.

Keywords: Face matching, orientation, spatial locality, state of art techniques, Neural Network

I. INTRODUCTION

Face recognition is one of the applications of image processing. Its task is to identify the face and deal with it all characteristics and features. It is used for security purposes and can be compared to other security tools including various biometrics such as finger prints, iris recognition system. It is accurate and allows for high enrollment and verification rates.

In facial recognition there are two main types of comparisons:

- Verification and
- Identification

In verification system compares the given individual with who they say they are and a decision is given by yes or no. Identification is process in which system compares the given individual to all other individuals in the database and gives a list of the matches. The common approach helps using neural network.

Neural Network is more capable of deriving multi-orientation information to various source analyses from a face image at different scenarios and scales with the derived information being of local nature from a particular source. The common approach helps using neural network.

Face recognition is to construct a filter bank for different scales and orientations to filter which has given face image with all filters from the bank storage. These approaches will provide results in an explosion of information as the dimensionality reduction of the input face pattern is growing by a factor equaling to the number of filters in the filter bank. The amount of data in neural network, face representation is commonly used to reduce information to getting detailed

information and more manageable size by exploiting various down sampling techniques, feature selection and subspace projection analysis before it is finally applied to a classifier in many working research field.

II. RELATED WORK

In among research reviews, the few researchers are working with different methods, Yamin Taigman et al. in 2014 have presented closing the gap to human level performance in face verification which is based on conventional pipeline. The conventional pipeline consist detection, alignment, representation and classification to face images. This pipeline methodology was used for the 3D face image to fill the gap for the better performance.

Wang et al. in 2008 proposed to inspect a correlation matrix constructing a bank of Bayesian Networks with the goal of selecting such various filter parameters used in filters comprising the filter bank would be as uncorrelated as possible. The same methodology can also be used to visualization and found difference between the classical and the principal Bayesian Networks. John Canny et al. in 2010 have presented a novel computational approach to edge detection proposed in their paper the basics of image processing concepts. They have also suggested the features of an image and their extraction methods. It reviewed the existing edge detection systems. S. Mallat et al. in 2010 has presented Singularity detection and image processing, learning in machine, networks, fractals, genetic algorithms, wavelets, and data mining for better performance. In his journal, he suggested a min-max composition rule to measure the similarity in various types of images. J. Canny et al. in 1998 studied on a computational approach to edge detection, and proposed the image denoising using multimodal keywords.

Rishi R. et al. in 1979 has presented to research interests including pattern recognition, regression techniques, image processing, and data mining. These are responsible for the analytics and models required to reduce the risk factor of the American Express credit

card business. R. Chaudhuri et al. in 2003 has reviewed in fields of research interest include pattern recognition, processing with wavelet and proposed the use of denoising and face detection.

III. FACE RECOGNITION STAGES

Face recognition is implemented using various stages main stages are shown in Fig 1



Fig1.Procedure for Face Recognition [1]

Detect: In this step the face is detected whether the human face appears in given image or where these faces are located.

Align: After the face is detected the alignment is done to justify the scales and orientation of patches. In this the face is need to be turned at 360 degrees.

Represent: After the normalization is done of the face by using light the system converts the data into the unique code.

Classification: This is the last step in this the new facial which is acquired is compared to the stored data and it compare whether it match or not.

IV. FACE RECOGNITION TECHNOQUES

In the face recognition process, to optimize the closing gap for human level performance in face verification has assumed the covariance matrix, eign values and vectors and feature vector using neural network.

A Covariance Matrix

It is specified to measure the extent to corresponding elements from two sets which move in the same direction orderly using matrix. Suppose A is the covariance matrix in which consists n number of elements of training face images and uses the n-1 eigenvectors for the dimension reduction. The covariance matrix can be computed through the following formula such as:

$$A = \Phi\Phi^T \quad (1)$$

Where, Φ is the matrix of preprocessed training sample face images.

B Eigen values vector

Eigenvectors are specified to find the association between various images to categories properties using matrix by constructing classes. Eigenvector is specified by the Eigen

face with Principal Component Analysis. It is used to computer vision problem of human face recognition. The vectors are derived by the matrix named as covariance for probability distribution over the high dimension vector space of face images. It is helpful in dimension reduction to the training face images.

$$\text{Eigenvalues decomposition} = \text{diag}(XX^T) \quad (2)$$

C Feature Vector

It is used for the n-dimension images to recognition in biometric face system. It provides the exact features of pattern vision in face recognition process. It take an image as input and gives an image output of face to real features in the existing face image and output face image.

V. CONCLUSION

This paper has attempted to review the techniques of face recognition. Face Recognition techniques is not only deals with accuracy but also check the relevance such as unique mark, iris filtering, mark, and so forth. Techniques for face discovery and different frameworks can be influenced by stance, vicinity or nonattendance of basic parts, outward appearance, impediment, picture introduction, imaging conditions, and time delay. A strong face acknowledgment framework is hard to create which lives up to expectations under all conditions with a wide extent of impact. Accessible applications created by specialists can as a rule handle maybe a couple impacts just; thusly they have restricted abilities with spotlight on some all-around organized application. A strong face acknowledgment framework is hard to create which lives up to expectations under all conditions with a wide extent of impact.

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