

A Study on Face Recognition System

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Abstract— According to previous research work exhibiting desirable properties including orientation selectivity or spatial locality in the face recognition system has found as the major change in the face images, Neural Networks have suffering from limited shortcomings which imbalanced crucially characteristics and Neural Network helps to size representation of a given face pattern, therefore among these shortcomings may match to the fact. However, various filters are not orthogonal in specified order for all and one to another for attained the correlated probability. This makes more suitable information which contained in the Neural Network face representation redundant as well as affects the size of face representation where to overcome problem. In this review 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.

Key words: Biometrics, Face Recognition System

I. INTRODUCTION

The process of face recognition involves the examination of facial features in an image, recognizing those features and matching them to one of the many faces in the database. There are many algorithms capable of performing face recognition; such as: Principal Component Analysis, Discrete Cosine Transform, 3D recognition methods, Gabor Wavelets method etc.

Almost techniques have been suffering from some limitation in the literature review to achieve the solution which may be cause to suffering from distortion of instrument as well as pose effects in the real life. However, these problems have to try solving by techniques exploiting and optimizing process such as neural network are not only suitable in amongst problem to solve but are extremely effective as well using some methodology

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.

Unlike other area of research work found in the literature review which primarily suggested with the problem in resizing effectively and reducing dimension in neural network for face representation. Once all are computed to different approach and will helpful to propose a new way of deriving and compact representation. By the way, using original filter bank of neural network for the derivation of face representation in which the proposed

methodology to employ novel eigen values constructed as a linear combination of neural network where these values are capable of achieving similar recognition rates than the original ones but using a far more compact face representation. Therefore, neural network provides correlation matrices of using matrices by means of eigen values as principal component analysis to face recognition.



Fig. 1 Generic method of face recognition

II. LITERATURE REVIEW

In previous research reviews, the few researchers have worked on different methods, Yamin Taigman et al. in have worked on the conventional pipeline consist detection, alignment, representation and classification to face images.

Wang et al. in 2008 proposed a correlation matrix constructing a bank of Bayesian. 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 processing with wavelet and proposed the use of demising and face detection. He also discussed the current status and future directions to simply the various tasks. He discussed and analysis the image features as color, texture, and shape in details. He also gives a summary of all the features with examples. For e.g. in texture recognition there are texture co-occurrence, Fourier power spectrum, Bayesian Network features and tamura features. He discussed much similarity measures classifier-based, elastic deformation and graph matching

R. Chaudhuri et al. in 2003 has reviewed in fields of research interest include pattern recognition, image processing, machine learning, neural networks, fractals, genetic algorithms, wavelets, and data mining for better performance. M. Chabert et al. has found edge detection in speckled SAR images using the continuous wavelet transform identified a proposed way to reduce the semantic gap by use of tamura features and converting them to linguistic terms i.e. high level concepts. They also suggested finding logical analogy in fuzzy logic edge detection system which uses a fuzzy clustering algorithm to convert tamura features to linguistic terms. 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. According to him, the image retrieval can be faster if the query is made by multimodal keywords i.e. use of image as well as textual keywords. He used three MPEG-7 descriptors analysis out

of seven color descriptors in his experimental results. He made the query in the form of a matrix by concatenating visual keywords and textual keywords in image processing.

G. Pajares et al. 2010 have presented a wavelet-based image fusion tutorial Pattern recognition and analyses the image segmentation using k-means algorithm for texture features and suggested the texture features and their mathematical formula in detail by used of k-means for clustering as it is the simplest algorithm. E. Brannock et al. 2009 has presented a synopsis of recent work in face detection using the DWT, texture analysis and description in linguistic terms. Jun Li et al. in 2006 has presented a wavelet approach to edge detection, and proposed denoising and face detection with high level semantics and discussed about high level features, low-level features and found semantic gap the ways to reduce the semantic gap. Marchori, A. Et al. in 2001 has suggested that by predicted the disease classes of the original image by enable to customize edge of image in the same diagnosis.

III. FACE RECOGNITION

Most current facial recognition systems work with numeric codes called face prints. Such systems identify 80 nodal points on a human face. In this context, nodal points are end points used to measure variables of a person's face, such as the length or width of the nose, the depth of the eye sockets and the shape of the cheekbones. These systems work by capturing data for nodal points on a digital image of an individual's face and storing the resulting data as a face print. The face print can then be used as a basis for comparison with data captured from faces in an image or video.

Currently, a lot of facial recognition development is focused on smartphone applications. Smartphone facial recognition capacities include image tagging and other social networking integration purposes as well as personalized marketing. A research team at Carnegie Mellon has developed a proof-of-concept iPhone app that can take a picture of an individual and -- within seconds -- return the individual's name, date of birth and social security number.

It is used for security purposes and can be compared to other biometrics such as finger print , iris recognition system. It is accurate and allows for high enrollment and verification rates.

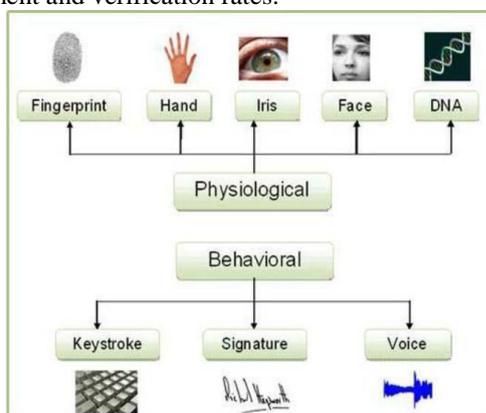


Fig. 2: Types of Biometrics [14]

IV. IMPLEMENTATION

The implementation of face recognition technology includes the three stages:

A. Data Acquisition

The input can be recorded video or any image. It involves retrieving an image from any source.

B. Input Processing

This module locates the position and surrounding light conditions.

C. Face Image Classification and Decision Making

The computer systems are used to classify the features respectively.

A new acquired pattern is compared with stored data sets.

V. CONCLUSION

Facial recognition software also enhances marketing personalization. For example, billboards have been developed with integrated software that identifies the gender, ethnicity and approximate age of passersby to deliver targeted advertising. However, if the subject's face is partially obscured or in profile rather than facing forward, or if the light is insufficient, the software is less reliable.

VI. FUTURE SCOPE

Face detection is widely used in many applications. So, it is essential to discover a suitable method for face detection. The literature survey has shown the various face detection algorithms. It is available that there exists trade-off between accuracy versus computation time. The algorithms which provide accurate matching details are frustrating and also the fast algorithms aren't much accurate so in the foreseeable future new face detection will soon be proposed which could increase the accuracy of face detection in addition to which comes up with less computational complexity. This work has not considered any improvement in the PCA based face recognition by integrating it with certain filters, contrast enhancement techniques or neural based training etc. So in future we will integrate the proposed technique with some well-known noise removal and image enhancement methods.

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