

An Image Based Approach of IRIS Recognition for Person Identification using Segmentation Algorithm

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Abstract— A biometric system gives automatic identification of an individual based on a unique feature or characteristic possessed by the individual. Iris recognition system is regarded as the most reliable and accurate biometric identification system available. Also, Iris recognition is considered to be the most reliable and accurate biometric identification system present. Iris recognition system captures an image of an individual's eye, the iris in the image is then meant for the segmentation and normalization for extracting its features. The performance of iris recognition systems mainly depends on the segmentation. Segmentation is used for the localization of the correct iris region in the particular region of an eye and it should be done accurately and correctly to remove the eyelids, eyelashes, reflection and pupil noises present in iris region. Iris images are selected from the Database, then the iris and pupil boundary is detected from rest of the eye image, by removing the noises. The segmented iris region was normalized to compress the dimensional inconsistencies between two iris regions by using Then the features of the iris were encoded by convolving the normalized iris. The Hamming distance was chosen as a matching metric parameter, which gave the measure of how many bits disagreed between the templates of the iris .

Keywords- iris recognition, biometric identification, pattern recognition, automatic segmentation.

I. INTRODUCTION

Face Recognition system becomes the most biometrics authentication techniques from the past years. Face recognition is successful application of Pattern recognition and Image analysis. Face recognition system has two main stages: verification and identification.

verification states that a 1:1 match that compares a face images against a template images whose identity being claimed. identification states that a 1: N problem that compares a query face image against all image templates in a face database. recognition of faces is gradually becoming very important due to its wide range of commercial and law enforcement applications, that includes forensic identification, access control, border surveillance and human interactions and availability of very low-cost recording devices. Various biometric features can be used for the purpose of human recognition such as the fingerprint, palm print, hand geometry, iris, face, speech, gaits, signature etc. The problem with a fingerprint, iris palm print, speech, gaits is that they need active co-operation of the person while face recognition is the process does not require it so without instructing the person can recognize the person. So face recognition is much more useful as compared to the other biometrics. Face recognition has a high identification or the recognition rate of

greater than 90% for huge face template databases with well-controlled pose and illumination conditions.

II. TECHNIQUES FOR FACE RECOGNITION

A. Eigenface

The Eigenface method is mostly used algorithm for face recognition. Karhunen-Loeve[3] is based on the eigenfaces method in which the Principal Component Analysis (PCA) is used. This method is successfully used to perform dimensionality reduction.[3]

implementation of an eigenface recognition system becomes easy. It is efficient in processing time and storage. PCA[3] reduces the dimension size of an image in a short period of time. There is a high An advantage of this algorithm is that the eigenfaces were invented for those purpose what makes the system very efficient [4]. A drawback is that it is sensitive for the lightening conditions and the position of the head.

B. Neural Networks

The neural networks are used in many applications such as pattern recognition problems, character recognition, object recognition, and autonomous robot driving. The main focus of the neural network in the face recognition is to give feasibility of training a system to capture the complex class of face

patterns. The disadvantage of the neural network approach is that when the number of classes increases. [5,6]

Multi-Layer Perceptron (MLP) with a feed forward learning algorithms was chosen for the system for its simplicity and its capability in supervised pattern matching.[7]

C. Fisherfaces

Fisherfaces is one the most widely used method for face recognition. It is based on appearance method. (1930) R.A Fisher developed linear/fisher discriminant analysis for face recognition.[12] It shows successful result in the face recognition process. It demonstrated in (Belhumeur et al., 1997; Zhao et al., 1999; Chen et al., 2000; Yu and Yang, (2001); Liu and Wechsler., 2002; Lu et al., 2003a, b; Ye and Li., 2004).[13] All used LDA to find set of basis images which increases the ratio of between-class scatter to within-class scatter. The disadvantage of LDA is that within the class the scatter matrix is single, since the number of pixels in images is larger than the number of images so it can increase the detection of error rate if there is a variation in pose and lighting condition within same images.

III. PROPOSED ALGORITHM

Iris recognition system is divided into four sections, iris segmentation, iris normalization, and feature extraction and matching. segmentation separates an iris region from the entire captured eye image. Iris normalization technique fixes the dimensions of segmented iris region for accurate comparisons. Feature extraction taken out the biometric templates from normalized image and matches this with reference templates. The performance of an iris system closely depends on the precision of the segmentation. The existing techniques assume that pupil is always central to an iris; hence both pupil and iris are on a central point. This inappropriate assumptions results in wrong a segmentation of an iris boundary. The upper and the lower parts of the outer iris boundary are generally obstructed by eyelids and eyelashes, this provides obstructions during segmentation process. These eyelids and eyelashes act as noise which needs to be eliminated to achieve optimum segmentation results.

IV. RESULT ANALYSIS

The proposed method is tested on the self-created database containing a set of facial images taken in different illumination of light and with different moods (facial expressions). The ear images of those persons are also taken and stored along with their facial images in the training set. There are 9 different facial images of each person stored in the database. All the images are taken against a plane white background with different illuminations of light with different facial expressions.

The mean image is obtained for the computation of the principle components. The eigen values are obtained and plot of same is shown in Figure

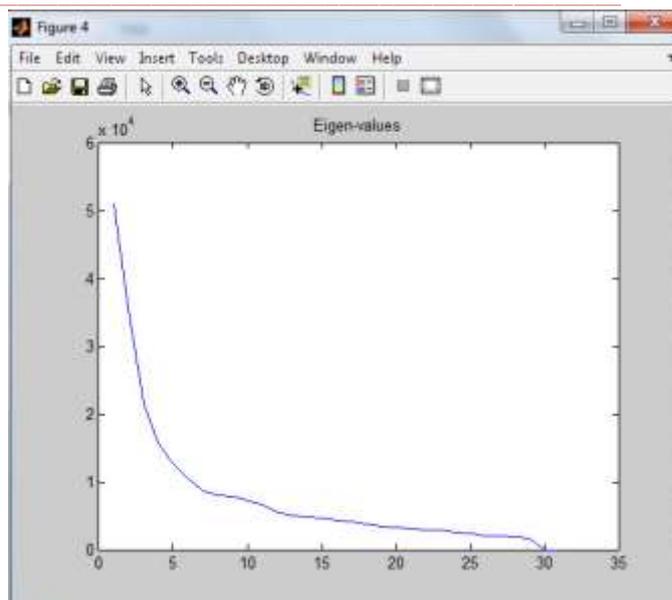


Fig: eigen values

V. CONCLUSION

Person Identification is very difficult problem in the field of image processing and computer vision. Because of lots of application in various fields, the face recognition has received great attention. In this different algorithms are used for people identification using iris. Much research effort around the world is being applied for expanding the accuracy and also capabilities of this biometric domain, with a consequent broadening of its application in the upcoming future. This research work proposed an effective iris segmentation technique for iris images.

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