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Kernel Fisher Analysis Based Feature Extraction for Face Recognition Using Euclidean Classifier

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ABSTRACT: Face recognition is one of the important factors in this real situation.The kernel approach has been proposed to solve face recognition problem (by mapping input space to high dimensional feature space).Algorithm such as KFA (Kernel Fisher Analysis), preprocessing and training the images and classify using classifier for the images taken from ORL dataset. Euclidean Classifier is used for recognition. The advantage of MATLAB software is chosen to implement the analysis.

KEYWORDS: Euclidean classifier, ORL database, Kernel Fisher Analysis.

I. INTRODUCTION

An image may be defined as a two-dimensional function, f(x, y), where x and y are spatial (plane) coordinates, and the amplitude of at any pair of coordinates (x, y) is called the intensity or gray level of the image at that point. When x, y, and the amplitude values of f are all finite, discrete quantities, we call the image a digital image. The field of digital image processing refers to processing digital images by means of a digital computer. Digital image processing refers to the processing of an image in digital form. Modern cameras may directly take the image in digital form but generally images are originated in optical form. They are captured by video cameras and digitalized. The digitalization process includes sampling, quantization. Pixel is the term most widely used to denote the elements of a digital image. consider the area of automated analysis of text.

Face recognition is of great importance in many applications such as identification and verification, employee access to high-security area, human-machine interfaces, law enforcement and automatic crowd surveillance.In my work kernel fisher analysis is proposed for feature extraction. Kernel fisher analysis is a recently proposed powerful classification procedure, applied in characterized by large number of inputs. Its aim is to acquire a non linear discriminate analysis in higher space.Euclidean classifier is used as a classifier. The images are taken from the ORL for face recognition

II. RELATED WORK

In Generic HFR framework which includes prototype random subspace is used . A set of training subjects with an image from each modality can be used as a prototype and depending on the modality of a new image, the image from each prototype subject can be selected from the corresponding modality. Random sampling provide better result.Accuracy of each of the tested HFR is low[1].In Locality constraints kernel space is used. It includes coupled spectral regression and coupled discriminate analysis. It is an effective subspace learning framework, deducing from the graph embedding view of subspace learning. Difference in appearance from different modalities is reduced. Local structure of the data is not preserved[2]. In Simplified Weber level descriptor is used**.**It extracts the geometry of a face and distribution of geometric features in an image. It finds the most of effective low dimensional embedding for the original sample data.Two database results are employed. Accuracy is low[3].

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III. PROPOSED ALGORITHM

The input image is taken from the ORL database. Preprocessing is used to remove the noise present in the image.It suppress the unwanted distortions and improve the image data. It is used to reduce the complexity of an image .It is used to suppress (i.e.) to reduce the amount of noise present in the image.

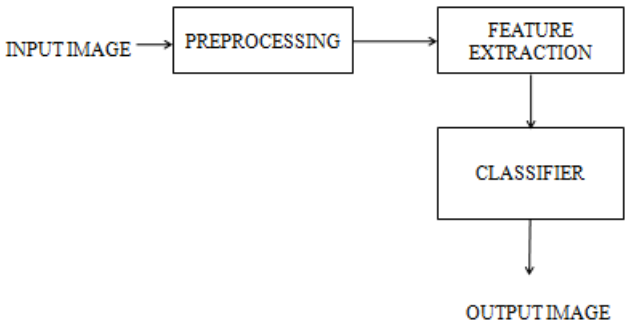

Figure 1 Block diagram of proposed system

Kernel Fisher Analysis(KFA) is proposed for feature extraction. The aim of KFA is to achieve a nonlinear discriminate analysis in the higher space.In ORL database there are 40 image sets.Each set consist of 10 images of different posture of same person.In my work for training eight images are taken and the other two for testing. The idea behind the Euclidian distance classifier is that one computes the average of several training vectors for each possible categorization and then classifies a given test vector by determining to which cluster the average is the vector nearest. The output image shows whether the image is matched with the image in the database. It is used for Identifying the correct person belonging to the purpose.

IV. SIMULATION RESULTS

The figure 2 is taken for the testing from the set of ORL images. This image is taken to find the similarities of the same image

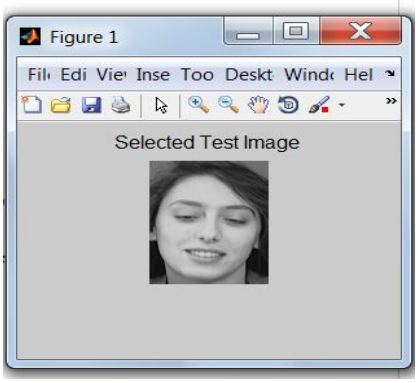

Figure 2 Test image

Fig 3 shows some of the posture similar to the test image taken. Similarly for all the set of images classification is done and recognition rate percentage is calculated.

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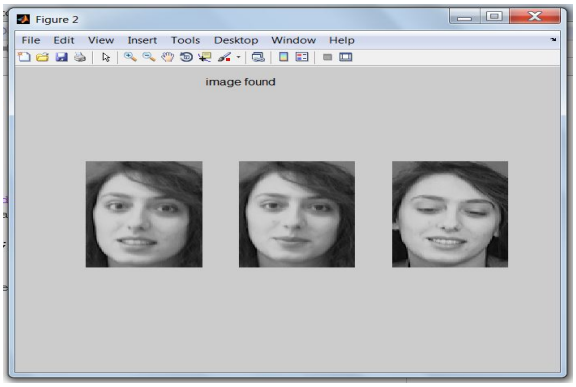

Figure 3 output for the selected test image

In fig 4 it shows the recognition rate percentage for first ten sets.For s1 the test image 1 is applied and the face is recognized and again test image 2 is applied and face recognition is done.With these two results overall recognition is calculated for s1.like this it is calculated for the entire set.

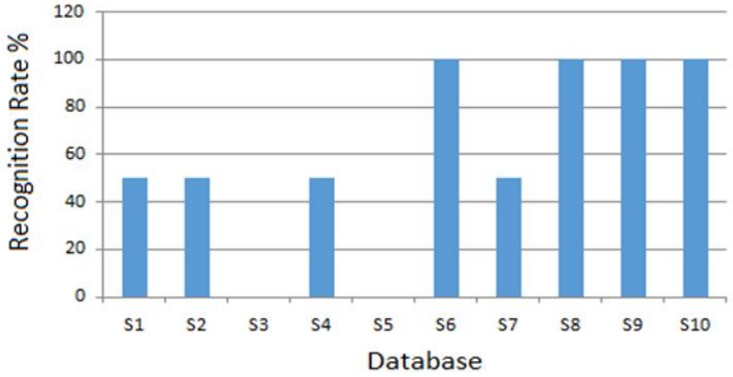

Figure 4 Recognition rate percentage for s1-s10

In fig 5 it shows the recognition rate percentage for sets S11-S20.For s11 the test image 1 is applied and the face is recognized and again test image 2 is applied and face recognition is done.With these two results overall recognition is calculated for s11.like this it is calculated for the entire set.

Figure 5 Recognition rate % for s11-s20

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In fig 6 it shows the recognition rate percentage for set s21-s40.For s21 the test image 1 is applied and the face is recognized and again test image 2 is applied and face recognition is done.With these two results overall recognition is calculated for s21.like this it is calculated for the entire set.The overall recognition rate percentage is **33.3%.**

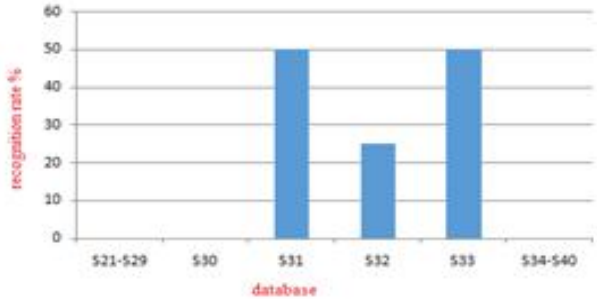

Figure 6 Recognition rate % for s21-s40

V. CONCLUSION AND FUTURE WORK

Face recognition is done with the help of algorithm such as KFA (kernel fisher analysis).The ORL database images are preprocessed to remove the noise and it is applied for feature extraction. The feature is extracted with the help of KFA algorithm.KFA map the input space to a high dimensional feature space so that it yields a non linear discriminant analysis in higher space. Next for the classification process neural network is applied (i.e.) Euclidean classfier is used here as a classifier. This classifier classifies the images efficiently and produces the desired result.using Euclidean classifier the overall recognition rate is 33%.

Future enhancement of this project will be real time images are applied for the above process with the same algorithm and classifier.

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