A REVIEW ON: FACE RECOGNITION USING LAPLACIANFACE

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Abstract - *Face Recognition using LaplacianFace describes about the appearance-based face recognition method called the Laplacianface approach. By using Locality Preserving Projections (LPP), the face images are mapped into a face subspace for analysis. Different from Principal Component Analysis (PCA) and Linear Discriminant Analysis (LDA) which effectively see only the Euclidean structure of face space, LPP finds an embedding that preserves local information, and obtains a face subspace that best detects the essential face manifold structure. The Laplacianfaces are the optimal linear approximations to the eigen functions of the Laplace Beltrami operator on the face manifold. In this way, the unwanted variations resulting from changes in lighting, facial expression, and pose may be eliminated or reduced. Theoretical analysis shows that PCA, LDA, and LPP can obtained from different graph models. The proposed LaplacianFace approach is compared with Eigenface and Fisher face methods on three different face data sets. Experimental results suggest that the proposed Laplacianface approach provides a better representation and achieves lower error rates in face recognition.*

Key words: **Face Recognition, Principal Component Analysis, Linear Discriminant Analysis, Locality Preserving Projections, Face Manifold, Subspace Learning.**

1. INTRODUCTION

A smart environment is one that is able to identify people, interpret their actions, and react appropriately. Thus, one of the most important building blocks of smart environments is a person identification system. Face recognition devices are ideal for such systems, since they have recently become fast, cheap, unobtrusive, and, when combined with voice-recognition, are very robust against changes in the environment. Moreover, since humans primarily recognize each other by their faces and voices, they feel comfortable interacting with an environment that does the same. Facial recognition systems are built on computer programs that analyze images of human faces for the purpose of identifying them. The programs take a facial image, measure characteristics such as the distance between the eyes, the length of the nose, and the angle of the jaw, and create a unique file called a "template." Using templates, the software then compares that image with another image and produces a score that measures how similar the images are to each other. Typical sources of images for use in facial recognition include video camera signals and pre-existing photos such as those in driver's license databases. Facial recognition systems are computer-based security systems that are able to automatically detect and identify human faces. These systems depend on a recognition algorithm, such as eigenface or the hidden Markov model. The first step for a facial recognition system is to recognize a human face and extract it for the rest of the scene. Next, the system measures nodal points on the face, such as the distance between the eyes, the shape of the cheekbones and other distinguishable features.

2. LITERATURE SURVEY:

Author	Year	Method	Advantage	Disadvantage
Xiaofei He, Shuicheng Yan, Yuxiao Hu, Partha Niyogi and Hong-Jiang Zhang	2003	Apperance-based	Resolve this problem is to use dimensionality reduction techniques.	n dimensional spaces are too large to allow robust and fast face recognition.
Prof. Sami M Halwani, Prof. M.V.Ramana Murthy, Prof. S.B.Thorat	2005	unsupervised and appearance based approach	Global Euclidean structure being used by principle component analysis (PCA)	Locality preserving projections (LPP) in which face images are mapped into a face subspace for analysis.
Muhammad Sharif, Sajjad Mohsin, Muhammad Younas Javed and Muhammad Atif Ali	2010	Laplacian of Gaussian (LOG) and Discrete Cosine Transform (DCT).	single image per person problem where the availability of images is limited to one at training side.	Collecting samples is costly in some cases and sometimes we cannot even do so.

J. Shermina	2011	Multilinear Principal Component Analysis (MPCA) and Locality Preserving Projection (LPP)	FERET and AT&T database of faces and compared with the existing MPCA and LDA approach in performance.	LPP and face recognition using L2 similarity distance measure.
Kunal kawale, Chinmay Gadgil, Mohanish Khunte, Ajinkya Bhuruk and Ranjana M.Kedar	2014	Locality Preserving Projections (LPP)	problem stems from the fact that in their most common form (i.e., the frontal view) faces appear to be roughly alike and the differences between them .	The face images are mapped into a face subspace for analysis.

3. METHOD

3.1 Read/Write Module

Here, the basic operations for loading and saving input and resultant images respectively from the algorithms. The image files are read, processed and new images are written into the output images.

3.2 Resizing Module

Here, the faces are converted into equal size using linearity algorithm, for the calculation and comparison. In this module large images or smaller images are converted into standard sizing.

3.3 Image Manipulation

Here, the face recognition algorithm using Locality Preserving Projections (LPP) is developed for various enrolled into the database.

3.4 Testing Module

Here, the Input images are resized then compared with the Intermediate image and find the tested image then again compared with the laplacian faces to find the aureate faces.

4. CONCLUSION

Our system is proposed to use Locality Preserving Projection in Face Recognition which eliminates the flaws in the existing system. This system makes the faces to reduce into lower dimensions and algorithm for LPP is performed for recognition. The application is developed successfully and implemented as mentioned above. This system seems to be working fine and successfully. This system can able to provide the proper training set of data and test input for recognition. The face matched or not is given in the form of picture image if matched and text message in case of any difference.

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