### Name : Veeresha M Thotigar Date: 03/25/2019

### Student ID: 16270975

### Email ID: vmt9mm@mail.umkc.edu

### 

## Summary of paper :

### Face Recognition Machine Vision System Using Eigenfaces

#### Fares Jalled, Moscow Institute of Physics & Technology, Department of Radio Engineering & Cybernetics

In the paper, written by Fares Jalled explains Face recognition System using Eigenfaces. The face recognition system consists of two important steps, the feature extraction and the classification. The paper is more concentrated on improving the feature extraction part.

At very first, paper talks about introduction to face recognition system, as mentioned above an identification set-up the similarity between a given face image and all the face images in a large database is computed, the top match is returned as the recognized identity of the subject.In this paper, the **N-PCA statistical technique** is presented for the face recognition. The experimental results compare with the popular **linear PCA statistical technique**. The classification step chooses to be the simplest *Euclidean distance classifier.*

The paper explains steps involved in the face recognition system The Acquisition Module, The Pre-Processing Module, The Feature Extraction Module , The Classification Module, Face Database. Further algorithm for face recognition is explained - Face recognition has a challenge to perform in real time. Raw face image may consume a long time to recognize since it suffers from a huge amount of pixels. One needs to reduce the amounts of pixels. This is called dimensionality reduction or feature extraction, to save time for the decision step. Feature extraction refers to transforming face space into a feature space.

The core part of the paper lies in N-PCA, NPCA is an extension over linear PCA in which firstly normalization of images is done in order to remove the lightning variations and background effects and singular value decomposition (SVD) is used instead of eigen value decomposition (EVD), followed by the feature extraction steps of linear PCA and lastly in classification steps weights are calculated for matching purpose.

Conclusion of the paper, experiments are run on IFD and ORL face database, The Eigenface approach for Face Recognition process is fast and simple which works well under constrained environment. It is one of the best practical solutions for the problem of face recognition. Instead of searching large database of faces, it is better to give small set of likely matches. By using Eigenface approach, this small set of likely matches for given images can be easily obtained. the experimental results shows that N-PCA gives a better recognition rate.

