Abstract

In this project, a system has been developed that can detect and recognize a face image. The system is to be trained with a set of face images, containing several face images of a group of person, to generate a set of eigenfaces. The system then compute the weight vectors for each person in the training dataset. These weight vectors describe the contribution of each eigenface in representing the image. The eigenfaces can also be considered as the basic set of face images, thus forming the face space.

In order to detect and/or recognize a face image, the system projects the face image into the face space formed by the eigenfaces. The projection of the test face in the face space results in obtaining a weight vector that describes the contribution of each eigenface in describing and representing the test face.

After obtaining the weight vector of the test face, the Euclidean distances between this weight vector and the weight vectors of the training dataset is calculated. If the average distance between the weight vector of the test face and the weight vectors of the training dataset is below a threshold value then the test face is declared as a known face, otherwise it is declared as an unknown face. The threshold value is determined by doing several experiments on the system with different test images. When the face is obtained as a known face then the test face is recognized using a minimum distance classifier.