Analysis Report

1   Face recognition using Principal Component Analysis(PCA).

Ans. Images of Faces of dimension m * n is taken and reduced to mn * 1. Then average face is calculated and substraced from all the face giving us the important features only. Now we calculate covariance matrix using this normalised matrix. Since the dimension of our matrix is mn * p where p is the number of images, so multiplying this would give us a mn * mn matrix which would be very huge, therefore we reduce the dimension by multiplying transpose of A matrix with A giving us dimension of p * p which quite less than previous one.We then calculate the eigen values and eigen vectors. Now we calculate the value of k(the number of best eigen faces). Then we find weight matrix for each face in the original dataset using linear combination of k best eigen faces. We repeat the same process with test images and then calculate the euclidean distance between the weight matrices. The minimum distance give us best matching face with in the train dataset corresponding to test image given. Every result were found to be correct.

2   Face recognition using Linear Discriminant Analysis(LDA).

Ans. First we apply PCA to the training dataset, then we calculate the average face vector for each class. Then we reduce the average face vector of each class form each class. Then we subtract total average face vector from class average face vector. After that we calculate between class scatter matrix. Then within class scatter matrix was calculated. Then we calculated the eigen face vectors and projected it onto lda space. For test image we repeat the same process as above and find the ecuclidean distance between them to recognize the matching faces.

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