**Face Recognition using PCA and LDA**

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**Dataset Used:**

Happy and sad faces of 100 people. Reduced to 40\*40 size and then used for further training.

**Training Steps (PCA):**

1. Create face database
2. Mean Calculation
3. Do mean zero
4. Calculate Co-Variance of the Mean aligned faces ()
5. Do eigenvalue and eigenvector decomposition:
6. Find the best direction (Generation of feature vectors)
7. Generate Eigenfaces
8. Generate signature of each face

**Training Steps (LDA):**

1. Apply PCA on the given data and make a database of projected faces, where k is

the number of selected principal components and p is the training population.

1. Divide the data into class like if each person has n images then,

number\_of\_classes = P/n;

1. Calculate the means of each class and mean of the Projected faces
2. Calculate the within class scatter matrix, and between class scatter matrix.
3. Use the criterion function.
4. Find the Eigen vector and Eigen values of the Criterion function.
5. Now we need to select the best principal components from there, we can select m best values based on the maximum Eigen values.
6. Construct feature (W vectors of using these k bests.
7. Generate the fisher faces (FF) by projecting the projected faces by this transformation matrix W.

**Observations:**

Percentage Accuracy of PCA: 71%

Percentage Accuracy of LDA: 90%