

LDRP Institute of Technology and Research, Gandhinagar

Machine Learning: Tools, Techniques and Applications

Date: 01.05.2018

Prof. (Dr.) Mahesh M. Goyani

Algorithmic steps for PCA:

Training Phase:

Step 1: Read M images

Step 2: Convert images in to vector and put them side by side in matrix Y

Step 3: Find the mean column vector m of Y

Step 4: Subtract mean vector from each vector of Y and store in X such that $X = Y - m$.

Step 5: Find the eigen vectors and eigen values of matrix $A = X^T * X$

Step 6: Sort eigen vectors in decreasing order of their eigen values

Step 7: Select first P eigen vectors $V = V(:, 1:P)$

Step 8: Project mean centered vectors on V such that $U = X * V$

Step 9: Find features of each training image: $TrnFV = U^T * X$

Test Phase:

Step 1: Read test image t

Step 2: Convert in to vector and subtract mean vector m from it: $t_m = t - m$.

Step 3: Project mean centered test image on to find test image features: $TstFV = U^T * t_m$

Step 4: Find euclidean distance between training feature vector TrnFV and test feature vector TstFV

Step 5: Find minimum distance and index

Step 6: Check the recognized image and test image.