

STATISTICAL METHODS IN AI

Mini Project -1

Report PCA

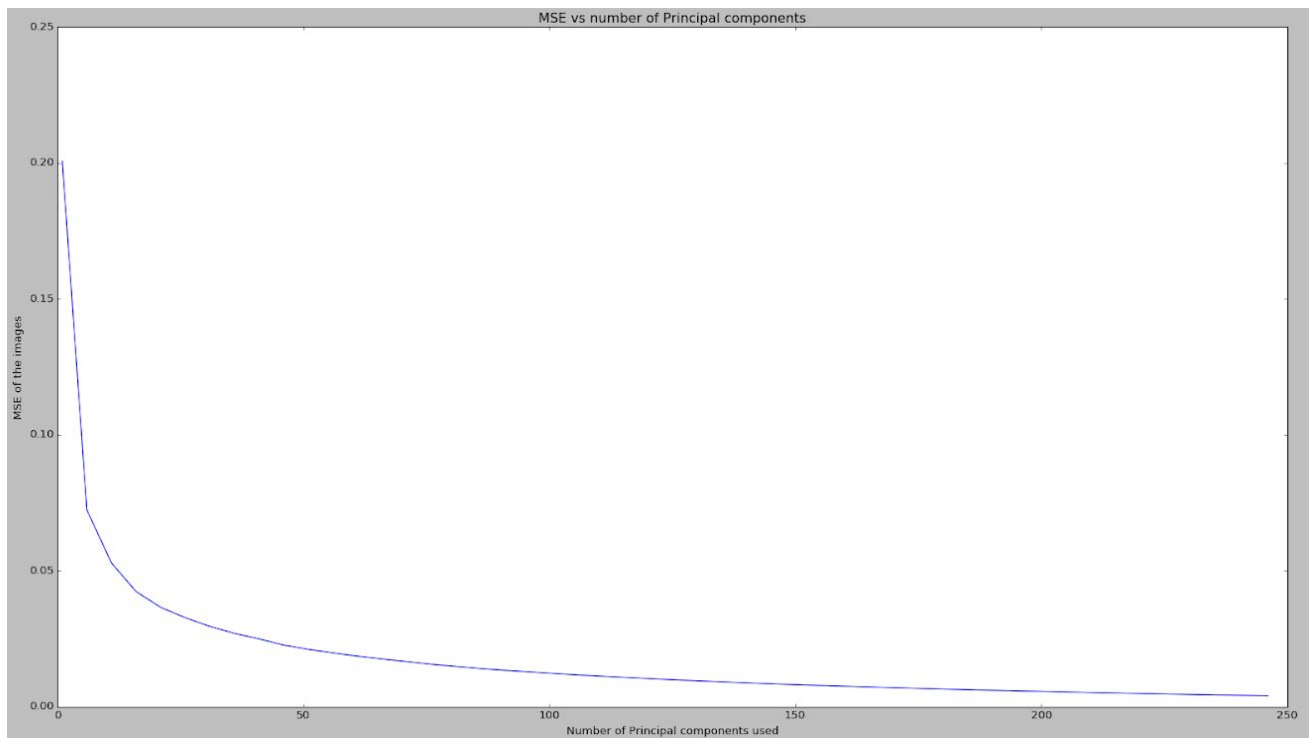
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20161236

PCA is used for dimensionality reduction, that is it reduces the dimensionality of the covariance or the feature matrix used to describe or classify samples. It maximizes the covariance along the new dimensions neglecting the small covariance changes.

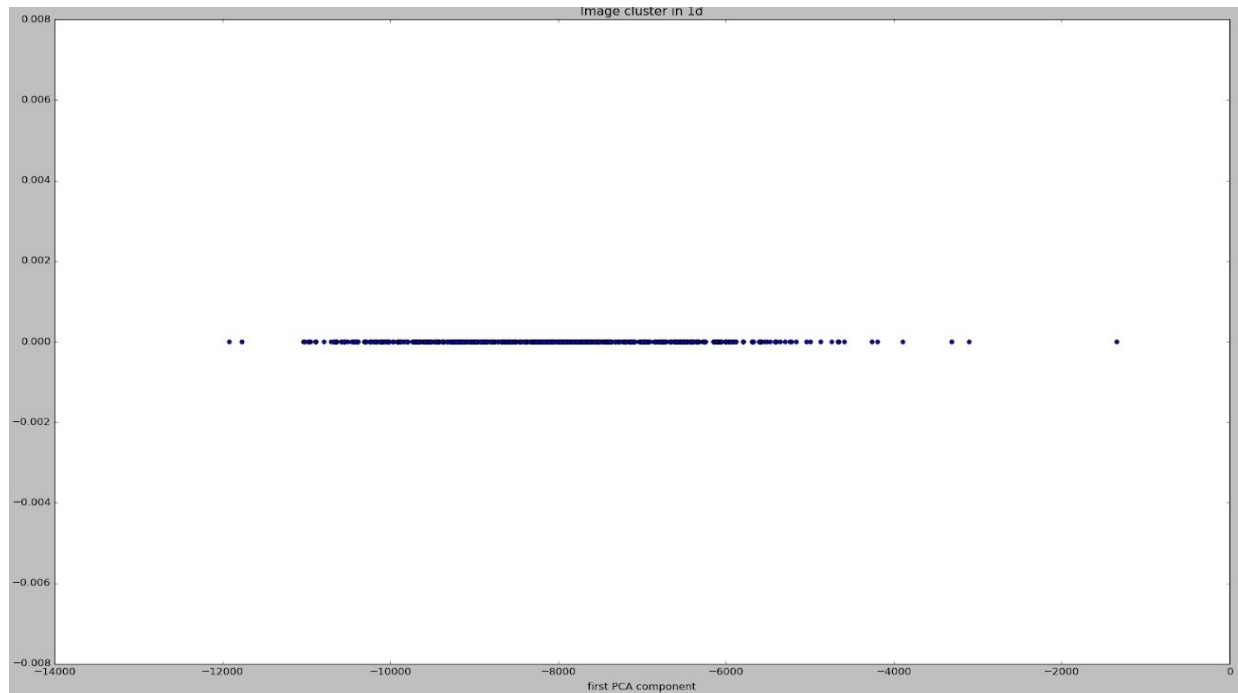
Outputs of the pca code

Normalized MSE error vs Number of Principal Components used



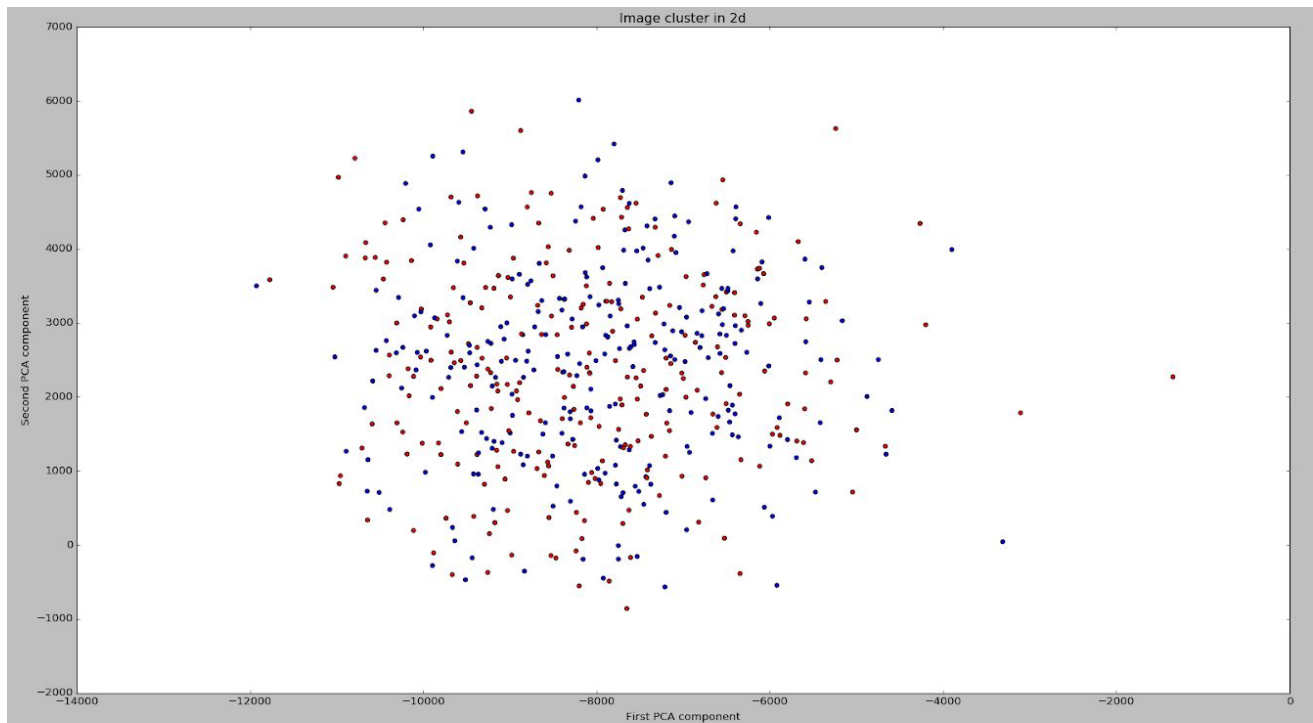
We can observe that the error decreases as the number of eigenvectors considered is increased upto 100 eigenvectors and then remains constant.

Image cluster in 1D



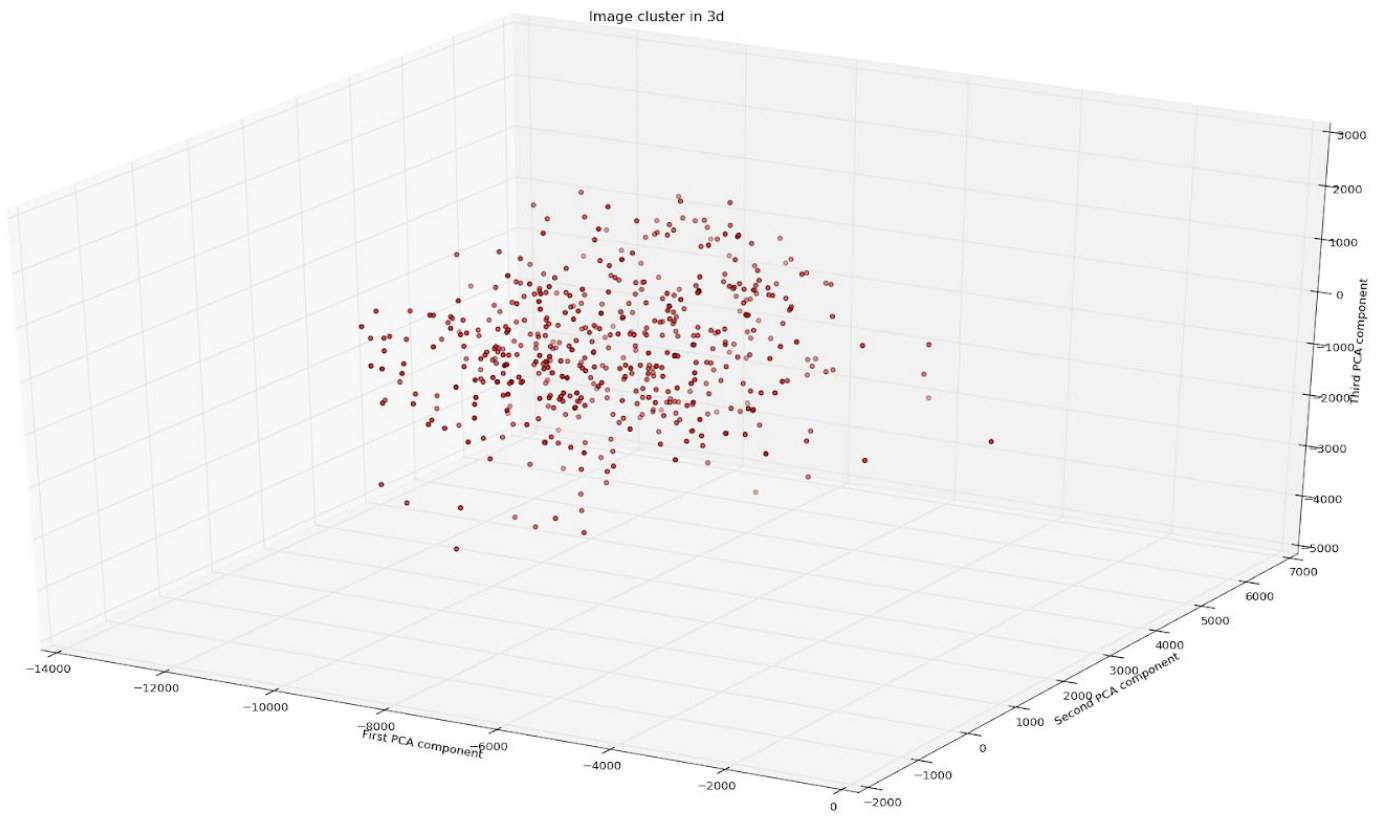
The cluster is constructed using one principle component

Image cluster in 2D



The cluster is formed using two principal components

Image cluster in 3D



The cluster is constructed using 3 principal components