Assignment 5

Computational Intelligence, SS2018

Team Members		
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1 Classication/ Clustering

1.1 2 dimensional feature

1.1.1 Perform all of the above-mentioned tasks for the EM algorithm.

1.1.2 Perform all of the above-mentioned tasks for the K-means algorithm

1.1.3 You may additionally choose any other pair of features; how would this change the classication accuracy

1.2 4 dimensional feature

1.2.1 How do the convergence properties and the accuracy of you classication change in comparison to scenario 2.1?

1.2.2 Within your EM-function conne the structure of the covariance matrices to diagonal matrices! What is the inuence on the result.

1.3 Processing the data with PCA

1.3.1 How much of the variance in the data is explained this way?

1.3.2 How does the performance of your algorithms compare to scenario 2.1 and scenario 2.2?

1.3.3 Apply PCA with whitening, so that the transformed data has zero mean and a unit covariance matrix. How does this inuence the choice of your initialization?

2 Samples from a Gaussian Mixture Model

2.1 Write a function Y = sample-GMM(alpha, mu, cov, N)

2.2 Using a GMM of your choice($K > 3$), demonstrate the correctness of your function