

Abstract

This report presents a tool for clustering images. Our image clustering tool incorporates three clustering techniques. First, technique incorporated is the Gaussian Mixture Model. In this technique, the Expectation Maximization algorithm was used to find the parameters for the model. Then the clustering is done by choosing the maximum posterior probability of the components. Second technique implemented is the Fuzzy C-means, where every pixel has a membership level of belonging to each of the clusters rather than just belonging to one cluster. Third and the last technique used is the Density Based Spatial Clustering of Application with Noise (DBSCAN) clustering technique. In DBSCAN, the number of cluster is not required to be provided by the user. In this algorithm extracts clusters as high density regions separated by low density regions. DBSCAN requires two input parameters namely the radius and the minimum number of points. These two parameters help in extracting the density based clusters from the image data.

To measure the ratio of the total variation and within-cluster variation of the clustered image, we used the β -measure. For, a given image, the higher the homogeneity within the clusters, higher is the β value. We conclude that out of the three clustering techniques that we have experimented on Gaussian Mixture Model technique gave the highest β value.