Abstract

Segmentation is a process of converting inhomogeneous data into homogeneous data. There are many segmentation techniques available in the literature. Among these techniques, finite Gaussian Mixture Model using EM algorithm is one mostly used. However, Gaussian Mixture Model is suited well when the image under consideration is symmetric. But in reality, medical
images are asymmetric. Hence, it is needed to develop new algorithms for segmenting non-symmetric images. Therefore, skew symmetric mixture model is utilized for this purpose. The segmentation is carried out by using Fuzzy C-Means clustering technique and the updated parameters are obtained through EM algorithm. The model is tested with 8 images and the segmentation evaluation is carried out by using objective evaluation criteria namely Jaccard Coefficient (JC) and Volumetric Similarity (VS), Variation of Information (VOI), Global Consistency Error (GCE) and Probabilistic Rand Index (PRI). The performance evaluation of reconstructed images is carried out by using image quality metrics. The experimentation is carried out using T1 weighted images and the results are compared with the existing models.

Reference

Segmentation of Brain MR Images based on Finite Skew Gaussian Mixture Model with Fuzzy C-Means Clustering

Index Terms

Computer Science
Medical Imaging

Key words
Segmentation
Objective Evaluation
Image Quality Metrics
EM algorithm

Skew Gaussian Mixture Model