Performance Evaluation of Various Segmentation Techniques on MRI of Brain Tissue

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Abstract : Accuracy of segmentation methods is of great importance in brain image analysis. Tissue classification in Magnetic Resonance brain images (MRI) is an important issue in the analysis of several brain dementias. This paper portraits performance of segmentation techniques that are used on Brain MRI. A large variety of algorithms for segmentation of Brain MRI has been developed. The objective of this paper is to perform a segmentation process on MR images of the human brain, using Fuzzy c-means (FCM), Kernel based Fuzzy c-means clustering (KFCM), Spatial Fuzzy c-means (SFCM) and Improved Fuzzy c-means (IFCM). The review covers imaging modalities, MRI and methods for noise reduction and segmentation approaches. All methods are applied on MRI brain images which are degraded by salt-pepper noise demonstrate that the IFCM algorithm performs more robust to noise than the standard FCM algorithm. We conclude with a discussion on the trend of future research in brain segmentation and changing norms in IFCM for better results.