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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 reviews the performance of segmentation techniques that are used on Brain MRI. A large variety of algorithms for segmentation of Brain MRI have been developed. This paper aims at to study the performance 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. After applying all methods on MRI brain images, which are degraded by salt-pepper noise, it is demonstrated that the IFCM algorithm performs more robust to noise than the standard FCM algorithm. We conclude with the trend of future research in brain segmentation by changing norms in FCM, for better results.

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### Index Terms

Computer Science

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### Keywords

Image Segmentation, Preprocessing, MRI, FCM, KFCM, SFCM and IFCM