

Improved Fast Fuzzy C-Means Algorithm for Medical MR Images Segmentation

ABSTRACT

Fuzzy c-means (FCM) clustering algorithm has been widely used in automated image segmentation. However, the standard FCM algorithm takes a long time to partition a large dataset. In addition, in current fuzzy cluster algorithms it is difficult to determine the cluster centers. This paper proposes a modified FCM algorithm for MR (Magnetic Resonance) brain images segmentation. This method fetches in statistic histogram information for minimizing the iteration times, and in the iteration process, the optimal number of clusters is automatically determined. Using this method, an optimal classification rate is obtained in the test dataset, which includes large stochastic noises. The experiment results have shown that the segmentation method proposed in this paper is more accurate and faster than the standard FCM or the fast fuzzy c-means (FFCM) algorithm.