Abstract

In this paper, a study for evaluating the efficacy of different feature sets that used brain tumor classification is presented. Different features sets are extracted as shape, 1st order texture features (FOS), 2nd order (GLCM, GLRLM), boundary features, and wavelet-based features. The brain tumors are extracted using the k-means clustering algorithm. Then different classifiers such as Artificial Neural Network (ANN), K-Nearest Neighbor (KNN), and Support Vector Machine (SVM) were used in the classification process.

A set of 65 real and simulated (Flair modality) MRI images from multimodal brain tumor image segmentation benchmark (BRATS) organized by MICCAI 2012 challenge is used for performance evaluation. The overall segmentation results for the 65 volumes are 90.15±0.12. For the Feature sets efficacy step, the highest accuracy of 94.74% is achieved by the SVM when using the wavelet–based features. The lowest accuracy achieved by the three classifiers obtained when using the second order texture features.
References


Index Terms

Computer Science

Image Processing

Keywords

Brain tumor segmentation, Feature extraction, Wavelet Transform.