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.
Evaluating the Efficiency of different Feature Sets on Brain Tumor Classification in MR Images

References

Evaluating the Efficiency of different Feature Sets on Brain Tumor Classification in MR Images


Techniques for the Quantification of Brain Tumors on MR Images. In: Suzuki K. (eds)
Computational Intelligence in Biomedical Imaging. Springer, New York, NY

18. Kassimi, M.A., El beqqali, O., "3D model retrieval based on semantic and shape

19. N. Nabizadeh and M. Kubat, "Brain tumors detection and segmentation in MR images:

fusion metric based on mutual information of image features," Computers & Electrical

21. C. Connolly and T. Fleiss, "A study of efficiency and accuracy in the transformation from
RGB to CIELAB color space," IEEE Transactions on Image Processing, vol. 6, pp. 1046-1048,
(1997).


Index Terms

Computer Science       Image Processing

Keywords

Brain tumor segmentation, Feature extraction, Wavelet Transform.