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Enhanced MR Image Classification Using Hybrid Statistical and Wavelets Features

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Abstract

Classification of brain tumor is one of the most vital tasks within medical image processing. Classification of images greatly depends on the features extracted from the image, and thus, feature extraction plays a great role in the correct classification of images. In this paper, an enhanced method is presented for glioma MR images classification using hybrid statistical and wavelet features. In the proposed method, 52 features are extracted using the first-order and second-order statistical features (based on the four MRI modalities: Flair, T1, T1c, and T2) in addition to the discrete wavelet transform producing a total of 152 features. The extracted features are applied to the multilayer perceptron (MLP) classifier. The results using the MLP were compared with various known classifiers. The method was tested on the dataset MICCAI BraTS 2015 which is a standard dataset used for research purposes. The proposed hybrid statistical and wavelet features produced 96.72% accuracy for high-grade glioma and 96.04% accuracy for low-grade glioma, which are relatively better compared to the existing studies. © 2013 IEEE.

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