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Latif, G., Butt, M.M., Khan, A.H., Butt, O., Iskandar, D.N.F.A.

Multiclass brain Glioma tumor classification using block-based 3D Wavelet features of MR images
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Abstract
With the advent of more powerful computing devices, system automation plays a pivotal role. In the medical industry, automated image classification and segmentation is an important task for decision making about a particular disease. In this research, a new technique is presented for classification and segmentation of low-grade and high-grade glioma tumors in Multimodal Magnetic Resonance (MR) images. In the proposed system, each multimodal MR image is divided into small blocks and features of each block are extracted using three Dimensional Discrete Wavelet Transform (3D DWT). Random Forest classifier is used for the classification of multiple Glioma tumor classes, then segmentation is performed by reconstructing the MR image based on the classified blocks. MICCAI BraTS dataset is used for testing the proposed technique and experiments are performed for Low Grade Glioma (LGG) and High Grade Glioma (HGG) datasets. The results are compared with different classifiers e.g. multilayer perceptron, radial basis function, Naïve Bayes, etc., After careful analysis, Random Forest classifier provided better precision by securing average accuracy of 89.75% and 86.87% is obtained for HGG and LGG respectively. © 2017 IEEE.

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