

# Intelligent Methodology for Brain Tumors Classification in Magnetic Resonance Images

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## Abstract

Recently, a lot of researches have been made in the area of automatic detection and diagnosing the brain tumor type based on different medical imaging techniques. This paper presents a new intelligent methodology applying k-means segmentation technique and a hybrid support vector machine (SVM) classifier based on Linear-SVM and Multi-SVM using two feature extraction techniques, namely : Gray level co-occurrence matrix (GLCM) and discrete wavelet transform (DWT) followed by Principle component analysis (PCA) to detect brain tumors in brain magnetic resonance images (MRIs) and differentiate between three types of malignant brain tumors: glioblastoma, sarcoma and metastatic bronchogenic carcinoma. The results of the two feature extraction techniques were compared according to their accuracy, sensitivity and specificity showing good results and high robustness.

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