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**Deep Fusion Model Enhanced CNN for MRI Brain Image Classification System**

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**Abstract**

Magnetic Resonance (MR) Imaging is a popular non-invasive modality for the visualization of different abnormalities in the brain due to its good soft-tissue contrast and accessibility of multispectral images. Using information from MR images, CAD systems have been developed to benefit doctors in rapid diagnosis. CAD systems can provide the diagnosis depending upon the specific attributes present in the medical images. The present study proposes a comprehensive method for the diagnosis of the cancerous region in the MRI images. Here, after image noise reduction, optimal image segmentation based on Support Vector Neural neural algorithm is utilized. Afterward, an optimized feature extraction and feature selection based on a modified region growing optimization algorithm are proposed for improving the classification accuracy of brain images. Further, it is also proposed that the input MR brain image be de-noised using a non-local Euclidean median in non-subsampled contourlet space. The classification accuracy of MRG with SVM is 74.24%, MRG with CNN is 82.67% and MRG with ANN is 62.71% and our proposed method MRG with MBCNN is 91.64%.

**Keywords:**

MRI image, CNN, Classification, Denoising Texture.

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