

Enhancing Brain Tumor Classification: A CNN-Based Approach with InceptionV3 and Xception

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Abstract: Brain tumors are among the most aggressive and deadly diseases, with a very short life expectancy at the highest grade. To combat this, early detection and treatment are crucial. In this approach, MRI images are used to analyze brain abnormalities. The manual investigation of brain tumor classification is a time-consuming task, and there might be possibilities of human errors. Hence, accurate analysis in a short span of time is essential. This approach presents the automatic brain tumor classification algorithm using a highly accurate Convolutional Neural Network (CNN), InceptionV3 and Xception algorithm for classification of Glioma, Meningioma and No tumor. The brain part is initially segmented by a thresholding approach followed by a morphological operation. The brain MRI is classified using CNN, Inceptionv3, and Xceptionv3 algorithms. The system's performance is evaluated using precision, recall, F1 score, and accuracy parameters.

Keywords: Brain Tumor, MRI, CNN, Machine Learning.