

Brain Tumor Detection: Transfer Learning Approach with VGG-16

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Abstract: Brain tumors have a profound impact on individuals worldwide, necessitating early detection to improve patient outcomes. This study explores the potential of deep learning in facilitating early tumor detection to aid medical professionals in timely intervention and personalized treatment strategies. While current tumor detection methodologies rely on traditional imaging techniques and manual analysis, they may suffer from limitations in accuracy and efficiency. To address these challenges, we propose a novel method using the VGG-16 architecture, a powerful Convolutional Neural Network (CNN) model, with pre-trained weights for feature extraction. By harnessing the capability of VGG-16, our model effectively discerns tumor patterns from brain MRI scans. The dataset utilized for training and evaluation consists of Brain MRI Images for Brain Tumor Detection from Kaggle, featuring a diverse range of annotated scans. During the evaluation, we focus on the primary performance metric of accuracy, which measures the model's ability to precisely classify tumor and non-tumor cases. Through extensive experimentation and analysis, we critically assess the model's performance and its potential clinical applicability.

Keywords: CNN, VGG-16, MRI, Brain Tumor Classification, Binary Classification, Accuracy, Data Augmentation, Medical Image Analysis etc

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