

Advancing Alzheimer's Diagnosis With AH_Ad: A Classification Model Based on MRI Images

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Convolutional neural networks (CNN) have demonstrated notable success in various image reconnaissance tasks, leading to their further application in medical diagnosis. In this study, an expanded CNN model based on EfficientNet-B0 is presented, capable of detecting and classifying Alzheimer's disease from brain magnetic resonance imaging. Using iterative development, the model achieved an impressive precision of 96%, highlighting its potential in early-stage diagnosis with a precision of 95%. The dataset obtained from a public repository, includes 40,384 images categorized in four classes: NoDemented, VeryMildDemented, MildDemented and ModerateDemented. Furthermore, this research incorporates an OSM (Occlusion Sensivity Map), which allows us to visualize the morphological areas of the brain in which Alzheimer's disease could be present. This not only helps to better understand the detections of the model, but also allows us to advance in early diagnosis and treatment, identifying brain areas suitable for individualized medicine. Thus, patients could be treated with targeted medications (targeted drugs), improving the effectiveness of the treatment and offering new perspectives for personalized medicine.

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