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Alzheimer's Disease Prediction Using Deep Learning

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Alzheimer's disease (AD) is a progressive neurodegenerative disorder that affects millions of people worldwide. Early diagnosis is crucial for effective intervention and management of the disease. In recent years, deep learning techniques, particularly Convolutional Neural Networks (CNNs), have shown promise in medical image analysis for detecting AD. This study explores the application of two prominent CNN architectures, ResNet and Alex Net, for the prediction of Alzheimer's disease from brain imaging data, such as MRI and PET scans. The models are pre-trained on large image datasets and fine-tuned on Alzheimer's-specific medical images. ResNet, with its deep architecture and residual connections, is used to capture complex features from brain images, while Alex Net, with a simpler architecture, provides a more computationally efficient alternative. The models are trained and evaluated using metrics like accuracy, precision, recall, and AUC-ROC, and the results demonstrate the effectiveness of both models in distinguishing between Alzheimer's patients and healthy controls. The study highlights the potential of deep learning models, particularly ResNet and Alex Net, in improving the accuracy and efficiency of early Alzheimer's detection, contributing to advancements in diagnostic methodologies.