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Parkinson and Alzheimer Disease Detection using Image Processing and ML

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Abstract: *Parkinson's disease (PD) is a neurodegenerative disorder that affects movement and cognitive function. Early diagnosis of PD is crucial for effective treatment and management of the disease. Magnetic resonance imaging (MRI) is a non- invasive diagnostic tool that can provide detailed images of the brain. Alzheimer's disease is a progressive brain disorder that affects memory, thought, and language, and is the most common type of dementia. It's not a normal part of aging, but the risk increases with age, and younger people can also develop it. In this study, we propose a method for PD and Alzheimer detection using MRI images based on image processing techniques and ML. Our approach involves several stages, including preprocessing, feature extraction, and classification. Preprocessing involves normalization, segmentation, and registration of the MRI images to remove noise and align the images for feature extraction. Feature extraction involves the use of handcrafted features such as intensity histograms, texture features, and morphological features to describe the MRI images. Classification involves the use of machine learning algorithms such as convolutional neural networks (CNNs) to predict whether an individual has PD and Alzheimer based on the extracted features. We evaluate our method on a publicly available dataset of MRI images from PD and Alzheimer patients and healthy controls. Our results show that our method achieves high accuracy, sensitivity, and specificity for PD and Alzheimer detection compared to existing methods. Our approach has the potential to improve early diagnosis and management of PD Alzheimer through non-invasive and accurate MRI-based diagnosis.*

Keywords: Convolutional Neural Network (CNN), Disease Prediction, Parkinson's disease, Magnetic Resonance Imaging (MRI), Image Processing)