Parkinson Disease Detection on MRI Images using Image Processing

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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. In this study, we propose a method for PD detection using MRI images based on image processing techniques. 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 based on the extracted features. We evaluate our method on a publicly available dataset of MRI images from PD patients and healthy controls. Our results show that our method achieves high accuracy, sensitivity, and specificity for PD detection compared to existing methods. Our approach has the potential to improve early diagnosis and management of PD through non-invasive and accurate MRI-based diagnosis..*

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

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