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Automated Detection of Parkinson's Disease Patterns in Spiral Drawings Using Convolutional Neural Networks

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Abstract : Parkinson's disease ranks as the second most common neurodegenerative disorder, affecting around one million individuals in the United States and resulting in approximately $52 billion in annual healthcare costs. Conventional diagnostic methods for Parkinson's, including MRI and Dopamine Transporter Scans, are both invasive and expensive. This paper presents a automated approach for diagnosis of Parkinson's based on the analysis of spiral drawing patterns using deep learning. We utilized a publicly accessible dataset containing spiral drawings from both healthy subjects and Parkinson's patients. Classification models were developed using MobileNetV2 and ResNet50 architectures. Our experimental results demonstrated that MobileNetV2, with its lighter framework, achieved a test accuracy of 91%, outperforming a more complex ResNet50 model. These findings indicate that CNNs, particularly MobileNetV2, provide a viable and less burdensome method for early detection of Parkinson's disease, potentially alleviating the economic and physical impacts of traditional diagnostic techniques.

Keywords : Parkinson's, machine learning, deep learning, MobileNetV2, ResNet50, transfer learning
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