Predicting Parkinson's Disease Using AI and Machine Learning

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Parkinson's disease is a neurological disorder that affects the motor skills of patients, affecting nearly 10 million people worldwide. This neurodegenerative disorder negatively affects the human body and mind in various ways such as tremors in the hand, lack of control of fine motor skills, degenerative speech conditions, as well as dementia. Diagnosing Parkinson’s disease is a cumbersome process, requiring multiple tests and visits to the neurologist’s office. Currently, the recent development in motor skill tests such as the Spiral Test and the Vocal Pattern tests have been used to improve the overall accuracy rate. Yet, there is still nearly a 20-25% inaccuracy rate, leading to many misdiagnoses. Nearly 40% of people with Parkinson’s disease may not be diagnosed with the disorder at all. In this research project, the data gathered from these 2 specific tests were analyzed using machine-learning algorithms, such as Neural Network, SVM, Logistic Regression, Naive Bayes, kNN, and Random Forest, to predict a diagnosis based on patterns from the data. The optimized ML algorithms from this project were able to drastically improve the precision of such diagnoses with a significantly higher accuracy for the Spiral Test and Vocal pattern tests. The results then provide a way to create a mobile application to accurately diagnose the disorder and make the detection process more convenient and accessible for many more people. With the expanding field of artificial intelligence and machine learning capabilities, the prospect of accurately predicting PD in patients can now be a reality.

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