Early diagnosis of Parkinson's disease using machine learning algorithms

Zehra Karapinar Senturk

Presented By: Asika Islam (22273013)

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Summary

Motivation: Machine learning is frequently used for medical disease diagnosis recently because of its implementation convenience and high accuracy. ML has also been used for the treatment of PD in the literature. In the paper, feature selection used for ML in brain surgery.

Contribution : FS was performed in this study for the diagnosis of PD via the phonetic features. The present study not only aimed to diagnose PD patients but also to evaluate the performances of FS algorithms on the classification performance. SVM with FS showed the highest classification performance and pure SVM showed the lowest performance.

Methodology : FS only the effective features were used and the cost of the analysis was reduced. Different FS algorithms were applied for different classification methods. New feature subsets and classifications were generated by using algorithms from the original feature set. Performance of the model was evaluated based on multiple criteria.

Conclusion: Classification methods together with FS methods is quite advantageous especially when dealing with speech signals in which hundreds of phonetic features can be obtained. By the help of the developed early diagnosis system, Parkinson's Disease can be diagnosed with a high accuracy rate in its early stages and the worse symptoms of the disease can be stopped.

Limitations

First limitation: Parkinson's disease diagnosis is the high number of features and medical datasets that reduce accuracy, speed and efficiency. The dataset used in this paper of this study consists of the features obtained from the speech signals of 31 people at the National Centre for Voice and Speech, Denver, Colorado.

Second limitation: Parkinson's disease is the second most common neurodegenerative disease with a global prevalence. Age is the most significant risk factor for developing Parkinson's disease, and men are more susceptible than women with a prevalence ratio of approximately 3:2.

Synthesis: This paper focuses on the studies after PD is diagnosed. ML methods to estimate cognitive consequences of PD. Stage prediction of PD was also performed by ML. The researchers focus on the early diagnosis of PD by this popular approach ML,tried to predict PD based on the motion data acquired from upper limbs of people.