

Parkinson disease prediction: “A machine learning approach”

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Abstract:

Dopamine-producing neurons are predominantly affected in a certain area of the brain, while neurodegenerative disorder happen in the human body, which calls Parkinson's disease (PD) The person who is affected by this disease can realize very hardly the hard stage of this disease as its syndromes usually develop gradually over years. Different person phase the different stage of it as its symptom's progression varies from person to person. People who go through this disease may feel some problems like: Vibration, mainly it happens during the resting periods in the hands. Other problems also can happen like the slowness of movements, limb raggedy, gait and balance problems, etc. That is why we need a proper process based on all these things where it will give us the right accuracy. And to help us out there is no better option than using machine learning. We have Created the data table based on the information taken from 31 individuals. 23 of people carrying Parkinson's disease (PD) were included among the 31 people in that measure in each column. 195 voice recordings were taken from these 31 people. These recordings can be found in each of the rows. There is a certain purpose of that survey. We can individualize the PD patients from the other people who are not carrying the disease. There is another column situated in the table according to medical status. 0 is the set for healthy and 1 is for PD people in the column. We can predict that the people are rather healthy or carrying the disease. Which is our primary intention?

Keywords: Support Vector Machine Analysis, Random Forests, Decision Tree, dataset classification, Imbalanced medical, Data Preprocessing.



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How to Cite

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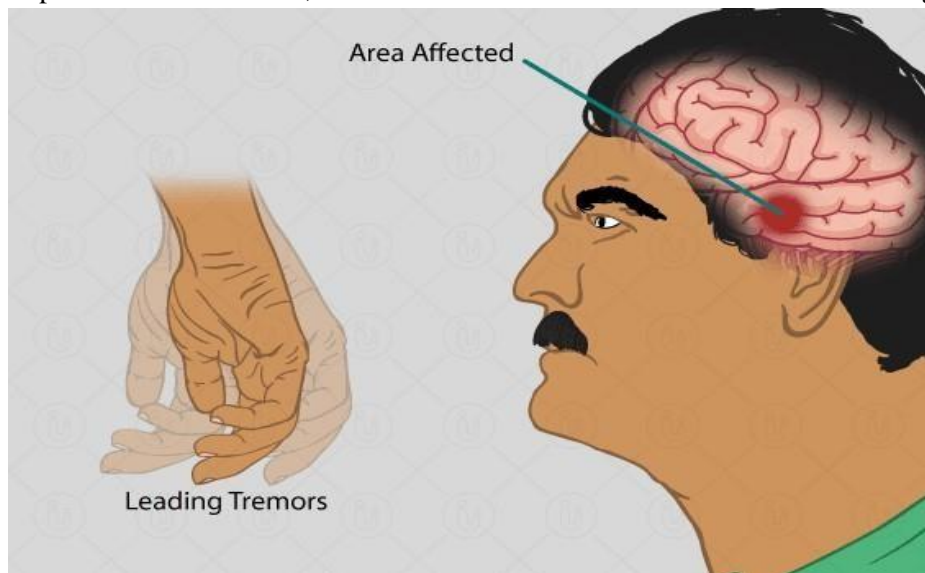
Introduction:

Parkinson disease (PD) is a most degenerative neural disease. Parkinson disease can be major and life threatening. Thus, causing movements of slowness, Limb rigidity, Gait and Balance problem. So that medicinal strategy might be soon obtainable with extended benefits that could affect the intrinsic vocalization. If our age over 50 years, then the hormone name Dopamine's release slowdown that is the main cause of Parkinson's Disease. In this Dataset our main goal is to intolerance the healthy people from those with Parkinson's disease (PD) Function of the "status".

This dataset is from University of California Irvine Machine Learning storehouse. This dataset is collected of a range of biomedical voice quantification total 54 from 31 people without any neurological disorders, 23 with Parkinson's disease (PD). Each column in the table is a particular voice Vocal, and

each row corresponds one of 195 voices put down from these individuals name, column. In this dataset UCI evaluates such important parameters of MDVP: F0(Hz), MDVP: Fei (Hz), MDVP: Flo (Hz), MDVP: Jitter (%).

If timely we can proper step and find out patient affected Parkinson's disease or not after that we provide proper treatment then the patient can be coming out of this disease in this dataset, we collect vocal (PD) affected people and non (PD) affected people then we use 0 for healthy people and 1 for (PD) affected people. In this research we use Random Forest Algorithm, Support Vector marching Algorithm, Decision Tree for find out Accuracy. We also generated image maps of Data visualization, Pair plot and Count plot and Data recording was carried out using the Vocal Recorder, which was located at the arm's length from the patient. The patient's Vocal was located in the Record working area.



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Literature Review

Before working on this project, we have read many previous thesis papers and some of the reviews we have attached in the table below.

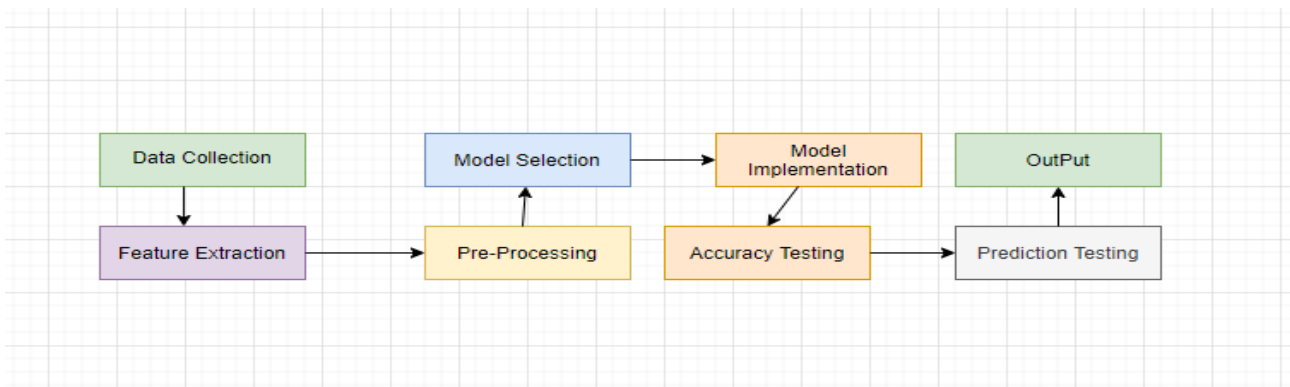
Paper Reference	Method	Proposed	Strength Limitation
Parkinson's Disease Detection by Using Machine Learning			Here the accuracy of
Algorithms and Hand Movement Signal From Leap Motion Sensor	Used KNN, SVM, Decision Tree (DT), Random Forest (RF) algorithm	Learning from that KNN method	the data is not applicable
Dynamically enhanced static handwriting representation for Parkinson's disease detection	USED KNN ALGORITHM	LEARNING ABOUT The "Parkinson's disease handwriting database"	Here the accuracy of the data is not applicable
Performance Analysis of Different Classification Algorithms Using Different Feature Selection Methods on Parkinson's Disease Detection	Used 3D masks for GM and WM datasets	Learning about 3D masks for GM and WM datasets	Here the accuracy of the data is not applicable

Methodology

At first, we have collected the data set. We have studied about the data set from Kaggle. We have also checked if there was any null value or missing value. Then we've preprocessed and visualized it. The data set is divided in two-part randomly. one is for training the model and the other one is for testing the model.

We have used three algorithms to find out the accuracy of our model.

1. The accuracy of training modeling in algorithm of support vector machine analysis is 88% and the accuracy of testing is 87%.
2. The accuracy of training modeling in algorithm of random forest is 100% and testing accuracy is 79.4%
3. The accuracy of training modeling in Decision tree implementation is 100% and testing accuracy is 71.79%



Result

In this system we have use three different kinds of algorithm to find out our model accuracy.

We have use Support Vector Machine Analysis, Random Forest and Decision tree implementation. In Support Vector Machine Analysis our model gets 88.4% accuracy score on training data and 87.17% accuracy score on testing data. In Random Forest our model gets 100% accuracy score on training data and 79.4% accuracy score on testing data. In Decision tree implementation our model get 100% accuracy score on training data and 71.7% accuracy score on testing data.

Conclusion

In this study from the dataset, we show that the accuracy of algorithm 88%. Now a days this disease is gives pain very much. From our model we can detect affected people and healthy people. From our model we used voice recordings for detect affected people. We use algorithm random forest, SVM, Decision Tree implementation. We can predict that the people are rather healthy or carrying the disease. Which is our primary intention.

Reference

1. Parkinson's Disease Detection by Using Machine Learning Algorithms and Hand Movement Signal from Leap Motion Sensor

<https://www.sciencedirect.com/science/article/abs/pii/S0957417415007381>

2. Dynamically enhanced static handwriting representation for Parkinson's disease detection

<https://www.sciencedirect.com/science/article/abs/pii/S0165027018302528>

3. Performance Analysis of Different Classification Algorithms Using Different Feature Selection Methods on Parkinson's Disease Detection

<https://www.sciencedirect.com/science/article/abs/pii/S0167865518307013>

