Project Proposal

Detecting Parkinson's disease using Vocal Data from Patients

Applied Probability and Statistics for Engineers

INDU 6310

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INTRODUCTION

Parkinson's disease is caused by a gradual deterioration in the function of nerve cells, or neurons, located in a specific area of your brain. Your brain contains millions of neurons, which process and transmit information. It receives information via neurons from all parts of your body, processes it, then sends out instructions to other parts of your body to produce specific actions. The information travels along neurons as electrical impulses. When a nerve impulse reaches the junction between two neurons, a chemical neurotransmitter is released that stimulates the impulse in the next neuron so that it continues on to its destination. Several different areas of your brain are used to process and transmit the information that controls movement, and a malfunction in any of these can cause a movement disorder.

PROBLEM DESCRIPTION:

Parkinson's disease is a neurodegenerative, progressive disorder of the central nervous system that affects movement and causes tremors and stiffness. This affects dopamine-producing neurons in the brain and every year, it affects more than 10 million individuals. Recently we have begun to utilize the data science to improve healthcare and services – predicting diseases early will have countless advantages on the prognosis. Our project proposal is to build a model that would detect Parkinson's disease using vocal data taken from patients.

DATA REFERENCE:

The dataset was created by Max little of the University of Oxford, in collaboration with the National Centre for Voice and Speech, Denver, Colorado, who recorded the speech signals. The original study published the feature extraction methods for general voice disorders.

This dataset is composed of a range of biomedical voice measurements from 31 people, 23 with Parkinson disease (PD). Each column in the table is a particular voice measure, and each row corresponds one of 195 voice recording from these individuals ("name" column). The main aim of the data is to discriminate healthy people from those with PD, according to the "status" column which is set to **0 for healthy and 1 for PD**.

SCOPE OF PROJECT:

Totally, we are interested in using related analysis which we will learn gradually through the syllabus of our statistic courses which involves the most important part of the analysis as below:

1- Data analysis
2- Statistical analysis
3- Numerical results
4- Conclusion

Although our project aims to figure out whether the person is suffering from Parkinson's disease or not based on only one parameter i.e. Vocal Disorder, We decided to solve problems related to this disorder. However, this paper aims to create scope for further studies based on other symptoms like walking, reaching for objects and other basic movements an outlook of the Parkinson's disease detection is created.