

Template for Veritas AI Research Proposal

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Summary of the Proposal

Parkinson's Disease, affecting nearly one million in the US alone, is a brain disorder caused by a loss of nerve cells in the Substantia Nigra, which is responsible for producing dopamine. Consequently, PD greatly affects motor control and movement, such as causing uncontrollable movements which typically worsen over time. Currently, diagnosing PD involves reviewing symptoms, medical history, and perform various examinations. There is no specific test to diagnose PD. However, many symptoms that PD typically invokes can be utilized to aid in diagnosis, specifically that of voice. Using a method called fractal scaling, a person's voice can be utilized to diagnosis whether they are 'healthy', or 'not healthy'. Thus, I propose a model to use logistic regression and fractal scaling to predict the possibility of PD.

Background

"Exploiting Nonlinear Recurrence and Fractal Scaling Properties for Voice Disorder Detection" delves into voice variation, which contained a large amount of arbitrary parameters and complex techniques to differentiate. However, Fractal Scaling emerges as a new technique to simplify the classification using a "hoarseness" diagram to determine normality or disorder from speech, which can distinguish healthy subjects from unhealthy subjects. This method has better classification performance, and is utilized in the dataset "Parkinson's Disease Detection". Using logistic regression, this distinguishing factor between a normal and unhealthy voice can be utilized to aid in PD diagnosis.

Goal and Objectives

The goal of this project is to create a more uniform method to diagnose Parkinson's Disease in earlier stages. This can be met by creating an algorithm that can verify the strength of the aforementioned correlation. This model will be research based, receive information about a problem, and use a prediction algorithm to get a result with accuracy, which can then validate whether the proposed method can aid i real life diagnosis.

Methods

Logistic Regression, "Parkinson's Disease Detection" (Dataset), and "Exploiting Nonlinear Recurrence and Fractal Scaling Properties for Voice Disorder Detection" (Study made to diagnose voices)

References