**Methodology**

The proposed methodology will be using a dataset having vocal characteristics of people having a neurological disease like PD extracted using the Praat software, a speech analysis software. These vocal characteristics being glottal features will have a lot of noise, so some pre-processing will be done to decrease that noise. Then comes the feature extraction step where the t-SNE model will be used as it has proven to be effective in the high dimensionality datasets and provides a high accuracy for classification. The extracted features will be split into train and test sets.

Here, we will be using a Recurrent Neural Network, using the keras library for the hidden layers. At each time step, we use the output of the last step as the input to the next, applying an activation function like SoftMax or ReLU or tanh. At the hidden layer, the ReLU function will be used as it provides the same benefits as Sigmoid function but with better performance. At the output layer, the SoftMax function would be preferred as its probabilities are interrelated. They sum up to one. So, if the likelihood of one class increases, the other has to decrease by an equal amount. Thus producing better probability prediction.

Afterwards hyper-parameter tuning will be done to enhance the results. Usually in datasets having vocal characteristics of patients, the number of entries is low, so sometimes the model starts to overfit the data. To avoid overfitting, the technique of dropout can be utilised. Regularization can also reduce overfitting.

After all this, the evaluation metrics like accuracy, precision and recall will be used to evaluate the model.