DETECTING PARKINSONS DISEASE USING MACHINE LEARNING

(APPLIED DATA SCIENCE)

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LITERATURE SURVEY

Survey 1:
Daiga Heisters (2011):
Parkinson's: symptoms, treatments and research:

Daiga Heisters et al. proposed the paper titled "Parkinson's: symptoms, treatments and research". This paper initially says that Current treatments can help to ease the symptoms but none can repair the damage in the brain or slow the progress of the condition; now, Parkinson's UK researchers are working to develop new treatments that can and finally worked together to 12 build on existing discoveries and explore these innovative areas of research, it is hoped that a cure for Parkinson's will be found. Parkinson's UK offers support for everyone affected,, including people with the condition, their family, friends and careers, researchers and professionals working in this area.

Survey 2:
Afzal Hussain Shahid and Maheshwari Prasad Singh (2016):
A deep learning approach for prediction of Parkinson's disease progression:

Afzal Hussain Shahid and Maheshwari Prasad Singh et al. proposed the paper titled "A deep learning approach for prediction of Parkinson's disease progression" . This paper proposed a deep neural network (DNN) model using the reduced input feature space of Parkinson's telemonitoring dataset to predict Parkinson's disease (PD) progression and also proposed a 11 PCA based DNN model for the prediction of Motor-UPDRS and Total-UPDRS in Parkinson's Disease progression. The DNN model was evaluated on a real-world PD dataset taken from UCI. Being a DNN model, the performance of the proposed model may improve with the addition of more data points in the datasets.

Survey 3:
T. J. Wroge, Y. Özkanca, C. Demiroglu, D. Si, D. C. Atkins and R. H. Ghomi (2018):
Parkinson's Disease Diagnosis Using Machine Learning and Voice:

T. J. Wroge, Y. Özkanca, C. Demiroglu, D. Si, D. C. Atkins and R. H. Ghomi et al., proposed the paper titled "Parkinson's Disease Diagnosis Using Machine Learning and Voice" .It is that it explores the effectiveness of using supervised classification algorithms, such as deep neural networks, to accurately diagnose individuals with the disease. Historically, PD has been difficult to quantify and doctors have tended to focus on some symptoms while ignoring others, relying primarily on subjective rating scales. The analysis of this paper provides a comparison of the effectiveness of various machine learning classifiers in disease diagnosis with noisy and high dimensional data. Their peak accuracy of 85% provided by the machine learning models exceeds the average clinical diagnosis accuracy of non-experts (73.8%) and average accuracy of movement disorder specialists (79.6% without follow-up, 83.9% after follow-up) with pathological post-mortem examination as ground truth.

Survey 4:
Mohamad Alissa (2018):
Parkinson's Disease Diagnosis Using Deep Learning:

Mohamad Alissa et al. Proposed the paper titled "Parkinson's Disease Diagnosis Using Deep Learning" . This project mainly aims to automate the PD diagnosis process using deep learning, Recursive Neural Networks (RNN) and Convolutional Neural Networks (CNN), to differentiate between healthy and PD patients. Besides that, since different datasets may capture different aspects of this disease, this project aims to explore which PD test is more effective in the discrimination process by analysing different imaging and movement datasets (notably cube and spiral pentagon datasets). In general, the main aim of this paper is to automate the PD diagnosis process in order to discover this disease as early as possible. If we discover this disease earlier, then the treatments are more likely to improve the quality of life of the patients and their families.

There are some limitations to this paper namely:
 ● They used the validation set only to investigate the model performance during the training and this reduced the number of samples in the training set.
● RNN training is too slow and this is not flexible in practice work.
● Disconnecting and resource exhaustion: working with cloud services like Google Collaboratory causes many problems like disconnecting suddenly. And because it is shareable service by the world zones, this leads to resource exhaustion error many times.

Survey 5:
T. Swapna, Y. Sravani Devi (2019):
Performance Analysis of Classification algorithms on Parkinson's Dataset with Voice Attributes:

T. Swapna, Y. Sravani Devi et al. proposed a paper and titled "Performance Analysis of Classification algorithms on Parkinson's Dataset with Voice Attributes" .This paper deals with the application of seven classification algorithms on the acquired data set and then drawing out a comparison of the results to one another and also predicting the outcome whether the person is healthy or Parkinson disease effected from the given data. The results of the selected algorithms namely Naïve Bayes, Random Forest, Neural Networks, Decision Trees, AdaBoost, SVM, KNN, LGBM were compared and tabulated. According to the outputs derived with the help of python, implementing Scikit Libraries. Final accuracy was calculated using these parameters. Random Forest algorithm gives with optimum accuracy of 78.56% which is closely followed by Decision Tree Algorithm with the optimal accuracy of 77.63%. Following the Decision Tree Algorithm is the MLP Classifier with an optimal accuracy of 76.72%, and the Naïve Bayes Algorithm which has the optimal accuracy of 70.82% and lastly Light Gradient Boosting Model has the optimal accuracy of 90% Finally, this algorithm can help in classifying whether a person get affected with Parkinson's disease or not.

Survey 6:
Anila M and Dr G Pradeepini (2020):
Diagnosis of Parkinson's disease using Artificial Neural network:

Anila M and Dr G Pradeepini et al. proposed the paper titled "Diagnosis of Parkinson's disease using Artificial Neural network". The main objective of this paper is that the detection of the disease is performed by using the voice analysis of the people affected with Parkinson's disease. For this purpose, various machine learning techniques like ANN, Random Forest, KNN, SVM, XG Boost are used to classify the best model, error rates are calculated, and the performance metrics are evaluated for all the models used. The main drawback of this paper is that it is limited to ANN with only two hidden layers. And this type of neural networks with two hidden layers are sufficient and efficient for simple datasets. They used only one technique for feature selection which reduces the number of features.

Survey 7:
Arvind Kumar Tiwari (2020):
Machine Learning-based Approaches for Prediction of Parkinson's Disease:

Arvind Kumar Tiwari et al. proposed the paper titled "Machine Learning-based Approaches for Prediction of Parkinson's Disease" . In this paper, minimum redundancy maximum relevance feature selection algorithms were used to select the most important feature among all the features to predict Parkinson diseases. Here, it was observed that the random forest with 20 10 number of features selected by minimum redundancy maximum relevance feature selection algorithms provide the overall accuracy 90.3%, precision 90.2%, Mathews correlation coefficient values of 0.73 and ROC values 0.96 which is better in comparison to all other machine learning based approaches such as bagging, boosting, random forest, rotation forest, random subspace, support vector machine, multilayer perceptron, and decision tree based methods.

Survey 8:

Siva Sankara Reddy Donthi Reddy and Udaya Kumar Ramanadham (2020): Prediction of Parkinson's Disease at Early Stage using Big Data Analytics:

Siva Sankara Reddy Donthi Reddy and Udaya Kumar Ramanadham et al. proposed the paper "Prediction of Parkinson's Disease at Early Stage using Big Data Analytics" . This paper describes mainly various Big Data Analytical techniques that may be used in diagnosing of right disease in the right time. The main intention is to verify the accuracy of prediction algorithms. Their future study aims to propose an efficient method to diagnose this type of neurological disorder by some symptoms at the early stage with better accuracy using different Big Data Analytical techniques like Hadoop, Hive, R Programming, MapReduce, PIG, Zookeeper, HBase, Cassandra, Mahout etc…

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