DETECTING PARKINSONS DISEASE USING MACHINE LEARNING (APPLIED DATA SCIENCE)

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LITERATURE SURVEY

SURVEY 1

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 2:

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 3

Early Detection of Parkinson's Disease Using Deep Learning and Machine Learning

Wu Wang, JUNHO LEE, FOUZI HARROU1 (Member, IEEE), AND YING SUN

Accurately detecting Parkinson's disease (PD) at an early stage is certainly indispensable for slowing down its progress and providing patients the possibility of accessing disease-modifying therapy. Towards this end, the premotor stage in PD should be carefully monitored. An innovative deep learning technique is introduced to quickly uncover whether an individual is affected with PD or not based on premotor features. Specifically, to uncover PD at an early stage, several indicators have been considered in this study, including Rapid Eye Movement and olfactory loss, Cerebrospinal fluid data,

and dopaminergic imaging markers. A comparison between the proposed deep learning model and twelve machine learning and ensemble learning methods based on relatively small data including 183 healthy individuals and 401 early PD patients shows the superior detection performance of the designed model, which achieves the highest accuracy, 96.45% on average. Besides detecting the PD, we also provide the feature importance on the PD detection process based on the Boosting method.

SURVEY 4

A Robust Machine Learning Approach Towards Detection of Parkinson's Disease - A. R. Susmitha & Saneev Kumar Das

Parkinson's disease is nowadays a very common brain ailment found in many individuals across the globe. The task of predicting or detecting Parkinson's disease requires expensive mechanisms to be adopted. But with the advent in technologies like machine learning, artificial intelligence, and many such, the detection and prediction based on specific parameters have become easier. This paper proposes a novel architecture to predict Parkinson's disease in individuals using specific attributes. We have used four significant classifiers viz., logistic regression, k-nearest neighbor, decision tree, and random forest. The performance obtained with the aid of each of the considered classifiers are presented diagrammatically. The proposed framework entails five layers basically including dataset collection, data wrangling, data validation, data analysis, model training and validation. The layers of the proposed framework are practically realized through proper implementation presented for the prediction of Parkinson's disease. A thorough visualization of principal component analysis is presented initially followed by visualization of freeviz chart, and decision tree. Further heatmap, and decision surface is provided. Finally, ending up with a performance comparison of the four considered classifiers using a three-dimensional surface plot. The highest accuracy is

achieved with the use of random forest classifier i.e., 94.3% and the lowest accuracy achieved is with the use of decision tree classifier i.e., 78.2%.

SURVEY 5

Biomarkers for Detection of Parkinson's Disease Using Machine Learning— A Short Review -- Moumita Pramanik, Ratika Pradhan & Parvati Nandy

Detection of Parkinson's disease (PD) from the symptom of motor oriented and non-motor oriented anomalies is a very crucial task. One of the reasons behind this disease is the deficiency of dopaminergic neurons in the brain that leads to various neurodegenerative disorders in the human being mostly in an aged person. Vocal impairments to tremors, difficulty in walking are the prominent symptoms found in Parkinson's disease. Medical scientists and practitioners introduced many biomarkers for ease of diagnosis of PD. This article provides a detailed analysis of various biomarkers such as acoustic, handwriting, Electroencephalography (EEG), and gait signals along with the associated machine learning approaches of PD subjects. This paper also enlightens the symptoms of PD in its various stages and delivers the information about the popular rating scales mostly referred by the medical practitioners during the diagnosis process.