

LITERATURE SURVEY

1. “Tasnimul HasanDetection of Parkinson’s Disease by Employing Boosting Algorithms” a review literature Mirza Muntasir Nishat, 2021

In this paper, four boosting algorithms are studied and implemented in UCI Parkinson’s Disease dataset. After rigorous simulation, the ML models exhibited satisfactory results in terms of different performance parameters like accuracy, precision, recall, F1-Score, AUC, Youden, specificity and error rate. However, the performances of the model are improved by tuning the hyperparameters with GridSearchCV. Hence, a detailed comparative analysis is portrayed where Light GBM displayed the highest accuracy of 93.39% after hyperparameter tuning. However, XGBoost and Gradient Boosting algorithm also depicted accuracies more than 90% but Adaboost demonstrated maximum 87.22% accuracy with hyperparameter tuning. This study thoroughly investigates the compatibility and applicability of different boosting algorithms in detecting Parkinson’s disease and observes their performances for both hyperparameter tuning and without hyperparameter tuning case with a view to developing an automated intelligent detection system for the ease of diagnosis. Machine learning algorithms applied to a computer-aided diagnostic system can assist in the most effective prediction of such disease. For instance, boosting algorithms prove to be effective in detecting Parkinson’s disease. In this work, Light GBM shows an accuracy of 93.39% and outperforms other algorithms with respect to other performance metrics. Thus, applying such algorithms will impose a positive impact inconstructing an e-healthcare system for the patients so that the treatment process can be expedited and the severity of the disease can be reduced significantly

2. Machine learning for the diagnosis of Parkinson's disease: a review of literature Jie Mei, Christian Desrosiers, Johannes Frasnelli, 2021

Diagnosis of Parkinson's disease (PD) is commonly based on medical observations and assessment of clinical signs, including the characterization of a variety of motor symptoms. However, traditional diagnostic approaches may suffer from subjectivity as they rely on the evaluation of movements that are sometimes subtle to human eyes and therefore difficult to classify, leading to possible misclassification. In the meantime, early non-motor symptoms of PD may be mild and can be caused by many other conditions. Therefore, these symptoms are often overlooked, making diagnosis of PD at an early stage challenging. To address these difficulties and to refine the diagnosis and assessment procedures of PD, machine learning methods have been implemented for the classification of PD and healthy controls or patients with similar clinical presentations (e.g., movement disorders or other Parkinsonian syndromes). To provide a comprehensive overview of data modalities and machine learning

methods that have been used in the diagnosis and differential diagnosis of PD, in this study, we conducted a literature review of studies published until February 14, 2020, using the PubMed and IEEE Xplore databases. A total of 209 studies were included, extracted for relevant information and presented in this review, with an investigation of their aims, sources of data, types of data, machine learning methods and associated outcomes. These studies demonstrate a high potential for adaptation of machine learning methods and novel biomarkers in clinical decision making, leading to increasingly systematic, informed diagnosis of PD.

3. C K Gomathy, “The Parkinson’s Disease Detection using Machine Learning Techniques.” 2021.

The Parkinson's disease is progressive neuro degenerative disorder that affects a lot only people significantly affecting their quality of life. It mostly affects the motor functions of human. The main motor symptoms are called "parkinsonism" or "parkinsonian syndrome". The symptoms of Parkinson's disease will occur slowly, the symptoms include shaking, rigidity, slowness of movement and difficulty with walking, Thinking and behavior change, Depression and anxiety are also common. There is a model for detecting Parkinson's using voice. The deflections in the voice will confirm the symptoms of Parkinson's disease. This project showed 73.8% efficiency. In this model, a huge amount of data is collected from the normal person and previously affected person by Parkinson's disease. these data are trained using machine learning algorithms. From the whole data 60% is used for training and 40% is used for testing. The data of any person can be entered in db to check whether the person is affected by Parkinson’s disease or not.

4. Remote smartphone monitoring of Parkinson’s disease and individual response to therapy : Larsson Omberg, Elias Chaibub Neto, Thanneer M Perumal, Abhishek Pratap, Aryton Tediario, Jamie Adams, Bastiaan R Bloem, Brian M Bot, 2022

Parkinson's disease (PD) is disabling disease that affects the quality of life. It happens due to the death of cells that produce dopamine's in the substantia nigra part of the central nervous system (CNS) which affects the human body. People who have Parkinson's disease feel difficulty in doing activities like speaking, writing, and walking. However, speech analysis is the most considered technique to be used. Researches have shown that 90% of the people who suffer from Parkinson's disease have speech disorders. With the increase in the severity of the disease, the patient's voice gets more and more deteriorated. The proper interpretation of speech signals is one of the important classification problems for Parkinson's disease diagnosis. This paper contemplates the survey work of the machine learning techniques and deep learning procedures used for Parkinson's disease classification.

5. Pavan Rajkumar Magesh, Richard Delwin Myloth, Rijo Jackson Tom, "An Explainable Machine Learning Model for Early Detection of Parkinson's Disease using LIME on DaTSCAN Imagery," 2020

Parkinson's Disease (PD) is a degenerative and progressive neurological condition. Early diagnosis can improve treatment for patients and is performed through dopaminergic imaging techniques like the SPECT DaTSCAN. In this study, we propose a machine learning model that accurately classifies any given DaTSCAN as having Parkinson's disease or not, in addition to providing a plausible reason for the prediction. This kind of reasoning is done through the use of visual indicators generated using Local Interpretable Model-Agnostic Explainer (LIME) methods. DaTSCANS were drawn from the Parkinson's Progression Markers Initiative database and trained on a CNN (VGG16) using transfer learning, yielding an accuracy of 95.2%, a sensitivity of 97.5%, and a specificity of 90.9%. Keeping model interpretability of paramount importance, especially in the healthcare field, this study utilises LIME explanations to distinguish PD from non-PD, using visual superpixels on the DaTSCANS. It could be concluded that the proposed system, in union with its measured interpretability and accuracy may effectively aid medical workers in the early diagnosis of Parkinson's Disease.

6. Dr D J Samatha Naidu, A. Raja Mohan Reddy," Detection of Parkinson Disease using Machine Learning Algorithm". International Journal of Research in Engineering and Science (IJRES)

Parkinson's disease (PD) is considered a malison for mankind for several decades. Stateof-the-art machine learning implementations namely Logistic Regression (LR), Support Vector Machine (SVM), Decision Tree (DT), K-nearest neighbors (KNN), Stochastic Gradient Descent (SGD) and Gaussian Naive Bayes (GNB) are executed in these modalities with their respective datasets. Furthermore, ensemble approaches such as Random Forest Classifier (RF), Adaptive Boosting (AB) and Hard Voting (HV) are implemented. In this paper, it is mainly been discussed as machine learning has the ability to assist doctors in detecting the disease at the right time.