Literature Survey

Detecting Parkinson’s Disease using Machine Learning

1.Sakshi Jadhav, Seema Thorat, Sakshi Fokane, Rahul Chakre, “Classification of Parkinson’s disease using Machine Learning Techniques”,2022.

The concepts of Deep Learning are discussed in this paper, while the application in Parkinson prediction is focused . To avoid the drawbacks of the conventional methods , new age deep learning techniques were proposed in this review paper . The included studies showed that Deep Learning techniques have significant impact on early detection of Parkinson with high accuracy rate. However, most of the proposed methods are still in development and not tested in a clinical setting . The work is mainly focusing on advancement of predictive models to achieve good accuracy in predicting valid disease outcomes using deep learning methods like prediction based on Artificial Neural Network (ANN). DeepLearning techniques are proposed for the prediction of Parkinson Disease in early stage in this paper.

2. 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.

3. Iqra Nissar, Waseem Ahmad Mir, Izharuddin, Tawseef Ayoub Shaikh, “Machine Learning Approaches for Detection and Diagnosis of Parkinson’s Disease,” 2021.

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.

4.Mosarrat Rumman, Abu Nayeem Tasneemet et al. "Early detection of Parkinson's disease using image processing and artificial neural network",2019.

The paper is based on Image Processing and Artificial Neural Network (ANN) classification algorithm. According to ANN(Artificial Neural Network) prediction, if value closer to 1 suggests PD and value closer to 0 suggest normal. Parkinson disease(PD) is a global public health issue Machine learning technique would be a best solution to classify individuals and individuals with Parkinson's sickness (PD). This paper gives an entire overview for the forecast of Parkinson disease by utilizing the machine learning based methodologies. A concise description of varied computational system based methodologies utilized for the forecast of Parkinson disease are introduced. This paper likewise displays the outline of results acquired by different scientists from accessible information to predict the Parkinson disease.

5.Zehra Karapinar Senturk, "Early diagnosis of Parkinson's disease using machine learning algorithms," 2020.

Parkinson's disease is caused by the disruption of the brain cells that produce substance to allow brain cells to communicate with each other, called dopamine. The cells that produce dopamine in the brain are responsible for the control, adaptation, and fluency of movements. When 60–80% of these cells are lost, then enough dopamine is not produced and Parkinson's motor symptoms appear. It is thought that the disease begins many years before the motor (movement related) symptoms and therefore, researchers are looking for ways to recognize the non-motor symptoms that appear early in the disease as early as possible, thereby halting the progression of the disease. In this paper, machine learning based diagnosis of Parkinson's disease is presented. The proposed diagnosis method consists of feature selection and classification processes.

6.Ankit kurmi, Shreya Biswas, Ram Sarkar et al. "An Ensemble of CNN Models for Parkinson's Disease Detection Using DaTscan Images",2022.

This paper have proposed an ensemble of DL models to predict Parkinson'sdisease effectively using the PPMI DaTscan images. Designed a fuzzy ensemblemodel, called FRLF which is applied on the confidence scores of four classic DL models- VGG16, ResNet50, Inception-V3, and Xception to enhance the overall results of the model. From the results reported, it ensures that the proposed model achieves state-of-the-art performance. Recognition accuracy, Precision, Sensitivity, Specificity, F1-score of the proposed model using DaTscan are98.45%, 98.84%, 98.84%, 97.67%, and 98.84% respectively. Also incorp orated this model in a GUI-based software tool for public use that instantly detects Parkinson 's disease in DaTscan images given to it as inputs. This played asignificant role in detecting Parkinson's disease in real-time. System is primarilybased on DaTscan images. But this have not yet extended the system to MRI scansor CT scans.

7.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. State-of-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.

8. P. Anudeep, P. Mouraya, T. Anandhi, “Parkinson’s Disease Detection using Machine Learning Techniques,” International Conference on Emerging Trends and Advances in Electrical Engineering and Renewable Energy, 2020.

It is a complex disease that has many different symptoms, so that not everyone with the condition suffers from the same problems. A more accurate, unbiased means of early detection is required, preferably one that individuals can use in their home setting. The proposed system for predictive analytics is a mixture of clustering of K-means and a decision tree used to gain insights from patients. The problem can be addressed with reduced error rate with the application of machine learning techniques. This proposed paper also produces accurate results by combining the spiral drawing inputs of patients impacted by common and Parkinson’s. This paper from using machine learning techniques, it can generate results that will show early detection of the disorder can promote the therapeutic care of the elderly and increase the chances of their life span and healthier lifestyle living peaceful life.

7. Sumeet Shinde , Shweta Prasad , Yash Saboo et al. “Predictive markers for Parkinson's disease using deep neural nets on neuromelanin sensitive MRI”,2019.

In this paper, system has established a computer-based analysis technique that uses convolutional neural networks (CNNs) to create prognostic and diagnostic biomarkers of PD from NMS-MRI. This technique also proposed that not only performs with a superior testing accuracy (80%) as compared to contrast ratio-based classification (56.5% testing accuracy) and radiomics classifier (60.3% testing accuracy), but also supports discriminating PD from atypical parkinsonian syndromes (85.7% test accuracy). Moreover, it also has the capability to locate the most discriminative regions on the neuromelanin contrast images. These discriminative activations demonstrate that the left substantia nigra pars compacta (SNc) plays a key role in the classification in comparison to the right SNc, and are in agreement with the concept of asymmetry in PD. Overall, the technique has the potential to support radiological diagnosis of PD while facilitating deeper understanding into the abnormalities in substantia nigra pars compacta (SNc).