

DETECTING PARKINSONS DISEASE USING MACHINE LEARNING

LITERATURE SURVEY:

1. Parkinson disease is a neural disease. It prompts shaking of the hands, difficulty to walk, balance with coordination. No medical treatment is available in the high-level stage. X-ray, CT scan and blood tests report are not sufficiently results available in the early stage. About two trillion community are alive in Parkinson's disease (PD) in the U.K., which is the highest number of people affected are pinpointed to have different sclerosis, solid dystrophy and Lou Gehrig's illness. This is relied upon to ascend to 1.5 million by 2040. Around the 75,000 Americans are diagnosis PD with every year. It is very important to predict Parkinson's disease early so that important treatment can be done. The purpose of work is to detect Parkinson disease, where we aimed to identify disease in early prediction using clinical imaging that incorporate the use of Machine learning techniques. A comparative analysis done with various Machine Learning classifier algorithms like XG Boost, Random Forest, KNN, SVM are the best model is proposed which is used to make predictions and find accuracy. We are observed that Random Forest provides better performance with an accuracy of 90%. Automatic detection with more accuracy will make screening for Parkinson disease as cost effective and efficient manner facilitates to use appropriate and fast solutions.
2. Parkinson's disease (PD) has affected millions of people worldwide and is more prevalent in people, over the age of 50. Even today, with many technologies and advancements, early detection of this disease remains a challenge. This necessitates a need for the machine learning-based automatic approaches that help clinicians to detect this disease accurately in its early stage. Thus, the focus of the research paper is to provide an insightful survey and compare the existing computational intelligence

techniques used for PD detection. To save time and increase treatment efficiency, classification has found its place in PD detection. The existing knowledge review indicates that many classification algorithms have been used to achieve better results, but the problem is to identify the most efficient classifier for PD detection. The challenge in identifying the most appropriate classification algorithm lies in their application on local dataset. Thus, in the paper three types of classifiers, namely, Multilayer Perceptron, Support Vector Machine and K-nearest neighbor have been discussed on the benchmark (voice) dataset to compare and to know which of these classifiers is the most efficient and accurate for PD classification. The Voice input dataset for these classifiers has been obtained from UCI machine learning repository. ANN with Levenberg–Marquardt algorithm was found to be the best classifier, having highest classification accuracy (95.89%).

3. Parkinson's disease is a degenerative disease that leads to brain disorder and nonfunctioning of different body parts. Deep learning tools like artificial neural network (ANN), convolution neural network (CNN), regression Analysis (RA), and so on, has been considered to a great extent in recent days. Several data sets based on the motor and nonmotor symptoms are applied to different classifier for correct identification of Parkinson's patient from healthy people. In the paper, hybridization of two deep learning tools such as, RA and ANN are done for effective diagnosis of the disease by probability estimation. The communal merits of individual approaches of the existing approaches are realized in this context for accurate probability estimation. Data preprocessing and probability estimation of preprocessed data is done in RA. The second existing approach is used to identify the PD patient by comparing with a predefined threshold value of a neuron. The estimation is performed on the data set of speech recognition, iron content, and pulse rate among a group of people. The proposed approach is compared with the existing approaches like, SVM and k-NN classifier. The computed result reveals the superiority of the proposed algorithm with 93.46% accuracy.

4. Nowadays, an important research effort in healthcare biometrics is finding accurate biomarkers that allow developing medical-decision support tools. These tools help to detect and supervise illnesses like Parkinson's disease (PD). This paper contributes to this effort by analyzing a convolution neural network (CNN) for PD detection from drawing movements. This CNN includes two parts: feature extraction (convolution layers) and classification (fully connected layers). The inputs to the CNN are the module of the Fast Fourier's transform in the range of frequencies between 0 Hz and 25 Hz. We analyzed the discrimination capability of different directions during drawing movements obtaining the best results for X and Y directions. This analysis was performed using a public dataset: Parkinson Disease Spiral Drawings Using Digitized Graphics Tablet dataset. The best results obtained in this work showed an accuracy of 96.5%, a F1-score of 97.7%, and an area under the curve of 99.2%.
5. Parkinson's disease (PD) occurs due to the deficiency of dopamine that regulates various activities of the human body. Researchers have identified that voice is an underlying symptom of PD. Recently, Machine learning (ML) has helped in solving problems of computer vision, natural language processing, speech recognition etc. OBJECTIVES: This paper aims to analyse the effect of feature type selection i.e. MFCC and TQWT on the efficiency of voice based PD detection system along with the use an ensemble learning based classifier for this task. Hence, in the work, various machine learning models, including Logistic Regression, Naive Bayes, KNN, Random Forest, Decision Tree, SVM, MLP, and XG Boost, have been employed and explored for PD detection purpose. The task of Feature selection was also done using minimum-Redundancy and Maximum-Relevance (mRMR) and Recursive Feature Elimination (RFE) techniques.

REFERENCES

1. Parkinson Disease Detection Using Various Machine Learning Algorithms
Publisher: IEEE By Kanakaprabha S, Arulprakash P, Srikanth R

2. Machine Learning Approaches for Parkinson's Disease Detection Gunjan Pahuja and T. N. Nagabhushan .Published on 22 Oct 2018
3. Efficient detection of Parkinson's disease using deep learning techniques over medical data by Lipsita Sahu, Rohit Sharma, Raghvendra Kumar
4. Parkinson's Disease Detection from Drawing Movements Using Convolutional Neural Networks August 2019 by Manuel Gil-Martín, Juan M Montero, Ruben San-Segundo
5. Parkinson Disease through Ensemble Machine Learning Approach: A Performance Study Published on July 2018 By EAI Endorsed Transactions on Pervasive Health and Technology - Iqra Nissar, Danish Raza Rizvi, Sarfaraz Masood, Aqib Mir