SRM
INSTITUTE OF SCIENCE & TECHNOLOGY
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PREDICTION OF PARKINSON'S DISEASE

21CSC305P - MACHINE LEARNING

REVIEW - 2

BATCH 12 :-

P. DIMPUL DURGA - RA2211003011478

K. SAILAGA - RA2211003011482

T. RAGHU - RA2211003011483

K. CHARMI AKSHITA - RA2211003011485

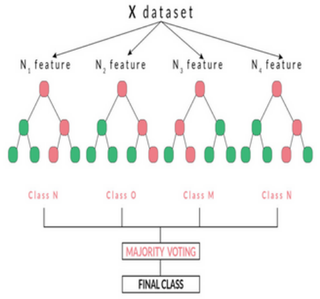
ALGORITHM USED

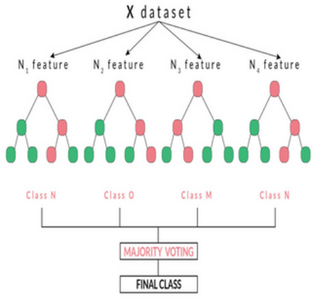
RANDOM FOREST ALGORITHM

Random Forest is a widely used machine learning algorithm for classification and regression tasks.

Its ensemble approach, where multiple decision trees are built and their outputs are aggregated, makes it robust and effective for medical predictions, such as Parkinson's disease (PD) diagnosis.

By using a Random Forest model, doctors and researchers can make more informed, data-driven predictions about whether a patient has Parkinson's disease based on various medical features, improving diagnostic accuracy.





ALGORITHM USED

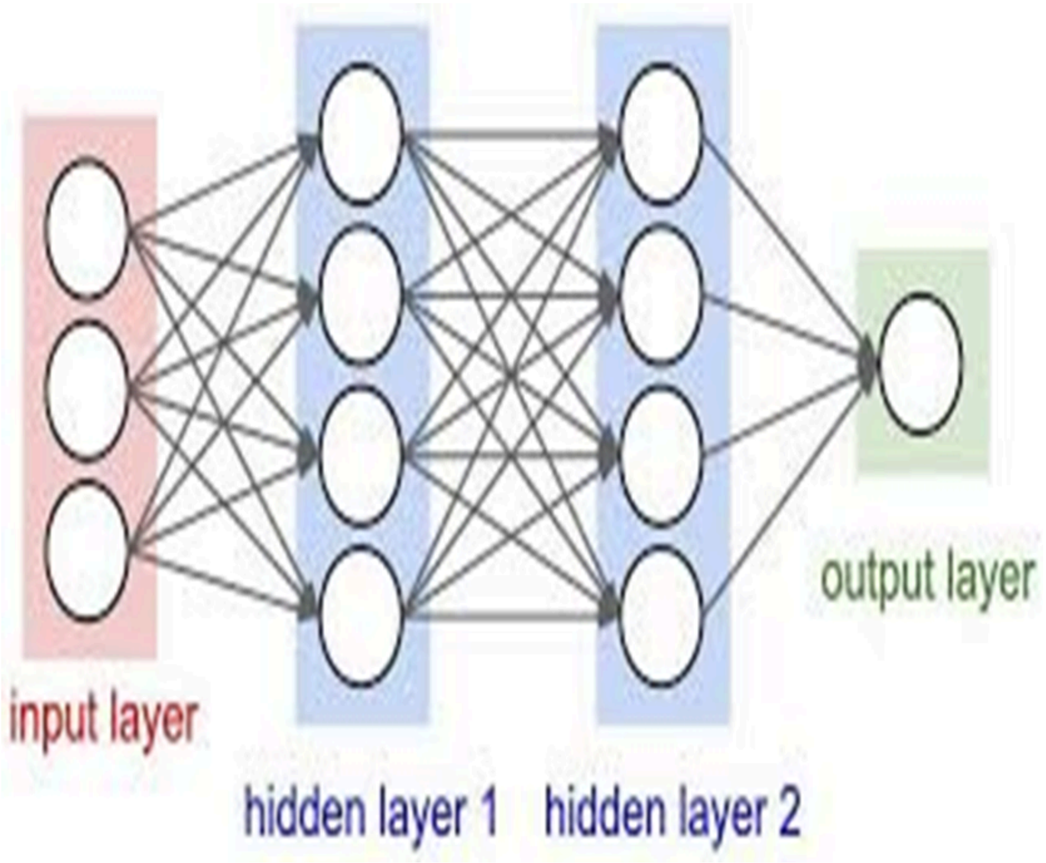
Deep Neural Networks

Deep Neural Networks (DNNs) are a type of artificial neural network with multiple hidden layers between the input and output layers, allowing them to model highly complex and abstract patterns in data.

Each layer transforms the input data into increasingly sophisticated representations, enabling the network to capture intricate features.

The deep structure of these networks allows them to excel in tasks like image recognition, speech processing, and natural language understanding.

DNNs learn by adjusting weights and biases through backpropagation and gradient descent, refining their predictions based on large datasets.



LITERATURE SURVEY

S.No	Title	Author	Methodology	Remarks
1	Machine Learning Techniques for Parkinson's Disease Prediction	Arora, P., Sahu, R., Panda, R.	Supervised learning techniques like SVM, Decision Trees, and k-NN.	Limited to vocal data, reducing generalizability. Small dataset from UCI may not represent the wider population.
2	Early Detection of Parkinson's Disease Using ML Algorithms	Kour, H., Devi, A.	Used Artificial Neural Networks (ANN) and Random Forest (RF). Employed clinical datasets with motor and non-motor symptoms.	Overfitting due to small and imbalanced datasets. Limited multi-modal datasets
3	Markov chains diagnosing the PD	Geman et. al.	They had considered PD as stochastic process due to its progressive nature	Markov Chains is memorylessness, meaning future stages depend only on the current stage, not on the history of transitions.
4	Diagnosing the PD, using the voice signal	Tuncer et. al.	They had operated the union of minimum average maximum tree along with singular value decomposition (SVD) on voice signal.	The method relies on vowel sounds, which may not capture the full range.
5	Records the action using leap motion controller	Vivar et. al.	Records the action made by patients during gentle exercise recorded by leap motion controller (LMC).	PD is known to have a wide range of symptoms and using only three categories may miss important nuances in motor function.
6	Clinical Assessment and Quantification	Samii et. al.	Clinically evaluate PD patients for tremor, rigidity and objective tools like accelerometers.	Clinical evaluation can be subjective, and symptom severity may fluctuate, leading to inconsistent assessments.
7	Predicting Parkinson's Disease Progression with Gradient Boosting	Shinde, S., et al.	Used gradient boosting and XGBoost models. Data included biomarkers and clinical assessments for PD prediction.	XGBoost models are prone to overfitting without proper tuning and limited by the availability.
8	Multimodal Data Fusion in Parkinson's Diagnosis	Prashanth, R., Roy, S. D.	Combined MRI imaging data with clinical data using Random Forests and SVM.	High computational costs for processing MRI data.

ARCHITECTURE DIAGRAM