Project Design Phase-I

Date	23 September 2022
Team ID	PNT2022TMID11558
Project Name	Detecting Parkinson's Disease using Machine Learning

Proposed Solution :

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	The disruption of brain cells that create dopamine, a chemical that enables brain cells to communicate with one another, results in Parkinson's disease. It is a chronic nervous system illness that affects movement, causes tremors, and causes stiffness. The condition typically worsens before the symptoms appear, and non-motor symptoms increase in frequency. Early signs that are most noticeable include tremor, rigidity, slowness of movement, and trouble walking.
2.	Idea / Solution description	**Existing Method :** The current approach only detects Parkinson's disease (PD) at the secondary stage (dopamine deficit), which creates medical issues. Additionally, a doctor must personally investigate and provide medical diagnosis suggestions, and because each patient's symptoms may differ, doing so is challenging. As a result, mental problems are misunderstood and are associated with other health issues. PD is typically identified using the following clinical techniques: 1. **MRI or CT Scan** 2. **PET Scan** 3. **SPECT Scan** The existing system is not effective in early prediction and accurate medicinal diagnosis to the affected people **Proposed Method :** ▪ Machine learning methods can be used to tackle the issue with a low error rate. The input is the Parkinson's disease voice dataset from the UCI Machine learning library. Additionally, our suggested technique yields precise results by combining the spiral drawing inputs of Parkinson's patients and healthy individuals. We suggest a method that accurately analyses patient data from spiral drawings and voice recordings. Combining both data, the doctor can determine whether something is normal or abnormal and then give the appropriate medication for the affected stage. ▪ In order to identify these drawings, we want to assess their aesthetic appeal (using the HOG method). In this research, we are employing a

		Random Forest classifier and the Histogram of Oriented Gradients (HOG) image descriptor to automatically diagnose Parkinson's disease in hand-drawn spirals and waves.
		▪ The project intends to offer a method for detecting Parkinson's illness using the **Python packages scikit-learn, numpy, pandas, and xgboost**. We'll import the data, obtain the features and labels, scale the features, divide the dataset, create an XGBClassifier, and then determine the model's correctness. By creating a model with XGBoost, the implementation's major goal is to categorise a person as either healthy or having Parkinson's disease.
3.	Novelty / Uniqueness	▪ To handle various sorts of sparsity patterns in the data, the XGBoost algorithm used to identify Parkinson's disease uses a sparsity-aware split discovery technique. The XGBoost algorithm's out-of-core computing capability maximises the use of the disc space that is currently available.
		▪ The goal of this project was to cover a wider range of imaging and machine learning technologies for diagnosing mental illness so that experts in the field could quickly determine the state of the art in the field. Furthermore, we stress the significance of early Parkinson's disease identification and prediction so that patients can receive care and support as soon as feasible.
4.	Social Impact / Customer Satisfaction	✓ increases accuracy of result as anticipated ✓ precise prediction with reasonable time complexity. ✓ It Prescribes the Medicines based on the affected Stage ✓ To Update their result to know their health condition ✓ Free to discuss their illness in the platform chat room ✓ instantaneous results for users.
5.	Business Model (Revenue Model)	✓ Suitable for improved participation saving ✓ By providing their basic data to the model, users are not required to pay any money. ✓ sufficient time is saved for internal processes.
6.	Scalability of the Solution	With various computations, XGBooster has good precision, accuracy, reviews, and so on. In terms of performance, XGBooster not only keeps up with those other algorithms but outperforms them. With a minimum of resources, XGBoost can resolve issues of a real-world scale.