

Project Design Phase-I
Proposed Solution Template

Date	19 September 2022
Team ID	PNT2022TMID35429
Project Name	Project - Detecting Parkinson's Disease Using Machine Learning
Maximum Marks	2 Marks

Proposed Solution Template:

Project team shall fill the following information in the proposed solution template.

S.No.	Parameter	Description
1.	Problem Statement (Problem to be solved)	More than 10 million people are living with Parkinson's Disease worldwide, according to the Parkinson's Foundation. While Parkinson's cannot be cured, early detection along with proper medication can significantly improve symptoms and quality of life.
2.	Idea / Solution description	The researchers found that the drawing speed was slower and the pen pressure is lower among Parkinson's patients. One of the indications of Parkinson's is tremors and rigidity in the muscles, making it difficult to draw smooth spirals and waves. It is possible to detect Parkinson's disease using the drawings alone instead of measuring the speed and pressure of the pen on paper. Our goal is to quantify the visual appearance(using HOG method) of these drawings and then train a machine learning model to classify them. In this project, We are using, Histogram of Oriented Gradients (HOG) image descriptor along with a Random Forest classifier to automatically detect Parkinson's disease in hand-drawn images of spirals and waves.
3.	Novelty / Uniqueness	In recent years, the number of publications on the application of machine learning to the diagnosis of Parkinson's disease has increased. Although previous studies have reviewed the use of machine learning in the diagnosis and assessment of PD, they were limited to the analysis of only certain diseases.As a result, the application of machine learning to clinical and non-clinical data of different modalities has often led to high diagnostic accuracies in human

		<p>participants, therefore may encourage the adaptation of machine learning algorithms and novel biomarkers in clinical settings to assist more accurate and informed decision making. Machine learning approaches therefore have the potential to provide clinicians with additional tools to screen, detect or diagnose Parkinson's Disease.</p>
4.	Social Impact / Customer Satisfaction	<p>Evaluation techniques that do not require high processing capacity have been implemented and Parkinson's detection has been made pocket friendly using this method.</p>
5.	Business Model (Revenue Model)	<p>Advertising this product is the key for this model to succeed. By advertising this on social media platforms and in a way that reaches people far away from central cities. Setting up health centers in various places with state of the art equipment would be essential to make this successful. And most of all, complete transparency towards the shareholders and public about the working of this technology must be available so there is no stigma among them.</p>
6.	Scalability of the Solution	<p>This can be scaled to detect other diseases like motor symptoms, kinematics, Alzheimer's Disease, Brain tumor, wearable sensor data and various neurological disorders. This method can be adopted in all testing labs and Hospitals to facilitate early detection . This method can analyse the breathing pattern of its patients to detect Parkinson's disease without contact of the equipment with a person's body, which is the ultimate goal of all medical research. This primarily has to be taken to people who do not have access to education and resources so we can reduce the number of deaths due to oblivion.</p>