Project Design Phase - I
Proposed Solution Document

Date	19 September 2022
Team ID	PNT2022TMIDD53042
Project Name	Detection of Parkinson's Disease using Machine Learning
Maximum Marks	2 marks

Proposed Solution:

S. No.	Parameter	Description
1	Problem Statement (Problem to be solved)	Parkinson's disease (PD) is a neurodegenerative movement disease where the symptoms gradually develop to start with a slight tremor in one hand and a feeling of stiffness in the body and it becomes worse over time. It affects over 6 million people worldwide. At present there is no conclusive result for this disease by non-specialist clinicians, particularly in the early stage of the disease where identification of the symptoms is very difficult. The disease is majorly said to be affecting the individuals who are living in village areas with their respective ages between 40 and 50. Lack of adequate knowledge poses a barrier in the provision of appropriate treatment and care for individuals with Parkinson's Disease. A survey between rural and urban areas found that 68% of rural people working in agricultural fields are getting majorly affected by Parkinson's disease whereas 32% of urban people are affected by the disease with ages over 50. Further research and analysis of the data was gathered from all over the network for figuring out the accurate reason as to why this disease majorly affects the agricultural life. The main target of this project is to develop an application which uses machine learning algorithm like regression or classification to identify and predict the disease.

2	Idea / Solution description	It processes the hand drawn spiral and wave images using a neural network that infers whether the patient has Parkinson's disease, and if they are identified then it assesses the severity of their disease in accordance with the Movement Disorder Society Unified Parkinson's Disease rating scale using ML algorithms.
3	Novelty / Uniqueness	Parkinson's Disease is detected at the secondary stage only (Dopamine deficiency) which leads to medical challenges. Also, doctor must manually examine and suggest medical diagnosis in which the symptoms might vary from person to person so suggesting medicine is also a challenge. Since the disease examination varies at different instances of the medical operations, using machine learning methods, the problem can be addressed with very less error rate. The hand drawn spiral and wave dataset of Parkinson's disease from the UCI Machine learning library is used as input. Also, our proposed system provides accurate results by integrating spiral drawing inputs of normal and Parkinson's affected patients. We propose a hybrid and accurate results analysing patient's both wave and spiral drawing data. This application offers medical advice and solutions as the next step after user is confirmed based on the presence of Parkinson's disease. This can be used direct by medical team for analysing and offering the solutions at much positive scaling time.
4	Social Impact / Customer Satisfaction	• Better interaction between the patient and the application • Personalized the UI experience • Provides accurate result as expected and gives accurate prediction at good time complexity • Reduces the complexity for doctors for detecting the disease due to varying symptoms
5	Business Model (Revenue Model)	• Prospects for improvement of decision making • Involves savings of the user • Easy and interactive interface

6	Scalability of the Solution	• Saves enough time for performing necessary operations to control the spread of the disease • Saves money from doing a lot of tests to detect the disease • Available for people with poor economic background • On the spot result for the users