

**Project Design Phase-I**  
**Proposed Solution Document**

<b>Date</b>	24.09.2022
<b>Team Members</b>	Manikandan C Lakshmanan N Logeshwaran M Mathivanan S
<b>Project Name</b>	Detecting Parkinson's Disease using Machine Learning

**Proposed Solution:**

<b>S.No.</b>	<b>Parameter</b>	<b>Description</b>
1.	Problem Statement (Problem to be solved)	<p>Diagnosis of Parkinson's disease (PD) is commonly based on medical observations and assessment of clinical signs, including the characterization of a variety of motor symptoms. However, traditional diagnostic approaches may suffer from subjectivity as they rely on the evaluation of movements that are sometimes subtle to human eyes and therefore difficult to classify, leading to possible misclassification. In the meantime, early non-motor symptoms of PD may be mild and can be caused by many other conditions. Therefore, these symptoms are often overlooked, making diagnosis of PD at an early stage challenging. To address these difficulties and to refine the diagnosis and assessment procedures of PD, machine learning methods have been implemented for the classification of PD and healthy controls or patients with similar clinical presentations (e.g., movement disorders or other Parkinsonian syndromes). To provide a comprehensive overview of data modalities and machine learning methods that have been used in the diagnosis and differential diagnosis of PD, in this study, we conducted a literature review of studies published until February 14, 2020, using the PubMed and IEEE Xplore databases. A total of 209 studies were included, extracted for relevant information and presented in this review, with an investigation of their aims, sources of data, types of data, machine learning methods and associated outcomes. These studies demonstrate a high potential for adaptation of machine learning methods and novel biomarkers in clinical decision making, leading to increasingly systematic, informed diagnosis of PD.</p>

2.	Idea / Solution description	<ul style="list-style-type: none"> <li>➤ It processes the breathing signals using a neural network that infer whether the person 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 using ML algorithms.</li> <li>➤ User can place their values and interact with the friendly user assistance bot which guides the person in using the application.</li> <li>➤ Great classification of the right variation of true and fake samples of data that is entered by users in the application.</li> </ul>
3.	Novelty / Uniqueness	<p>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. So hence the disease examination varies at different instances of the medical operations. Here by using machine learning methods, the problem can be addressed with very less error rate. The voice 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 analyzing patient both voice 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 analyzing and offering the solutions at much positive scaling time.</p>
4.	Social Impact / Customer Satisfaction	<ul style="list-style-type: none"> <li>➤ Increases interaction with the human and application.</li> <li>➤ Personalize the UI experience.</li> <li>➤ Improves accurate result as expected.</li> <li>➤ An automated chatbot controls the user interaction environment.</li> <li>➤ Accurate prediction at good time complexity.</li> </ul>

5.	Business Model (Revenue Model)	<ul style="list-style-type: none"> <li>➤ Solutions prospects of improvement.</li> <li>➤ Suits for better saving of involvements.</li> <li>➤ Economic Development.</li> <li>➤ Easy interface.</li> </ul>
6.	Scalability of the Solution	<ul style="list-style-type: none"> <li>➤ Good conversation with ethnicity people.</li> <li>➤ Saves enough time for performing internal operations.</li> <li>➤ It does not require for the users to spend some money in offering their basic data into the model.</li> <li>➤ On the spot result for the users.</li> </ul>