**LITERATURE SURVEY**

**INTRODUCTION:**

This survey explains the project's theoretical foundation. It begins with a description of Parkinson's disease, then moves on to overviews of machine learning, deep learning, related work, and PD diagnosis issues. The initial stage is crucial for the discovery of PD.

Parkinson's disease (PD) is often diagnosed based on clinical signs, such as the description of a range of movement symptoms, and medical observations. Traditional diagnostic methods, on the other hand, could be prone to subjectivity issues since they rely on the interpretation of motions that might be difficult to define because they are sometimes subtle to the human eye. Meanwhile, the early non-motor symptoms of Parkinson's disease (PD) may be slight and brought on by a variety of other illnesses.

Therefore, it might be difficult to diagnose PD at an early stage because these symptoms are frequently disregarded. Machine learning algorithms have been applied for the classification of PD and healthy controls or patients with comparable clinical presentations to solve these issues and improve the diagnosis and assessment procedures of PD (e.g., movement disorders or other Parkinsonian syndromes). to give a thorough overview of the data modalities and machine learning techniques that have been employed in the identification and classification of PD. [1]

**ABSTRACT:**

In the present decade of accelerated advances in Medical Sciences, most studies fail to lay focus on ageing diseases. These are diseases that display their symptoms at a much advanced stage and makes a complete recovery almost improbable. Parkinson’s disease (PD) is the second most commonly diagnosed neurodegenerative disorder of the brain. One could argue, that it is almost incurable and inflicts a lot of pain on the patients. All these make it quite clear that there is an oncoming need for efficient, dependable and expandable diagnosis of Parkinson’s disease. A dilemma of this intensity requires the automating of the diagnosis to lead accurate and reliable results. It has been observed that most PD Patients demonstrate some sort of impairment in speech or speech dysphonia, which makes speech measurements and indicators one of the most important aspects in prediction of PD. The aim of this work is to compare various machine learning models in the successful prediction of the severity of Parkinson’s disease and develop an effective and accurate model in order to help diagnose the disease accurately at an earlier stage which could in turn help the doctors to assist in the cure and recovery of PD Patients

**REFERENCES:**

# [1] [Prediction of Parkinson’s Disease using Machine Learning Techniques on Speech dataset](https://rjptonline.org/AbstractView.aspx?PID=2019-12-2-33)

**Authors:**

Basil K Varghese , Geraldine Bessie Amali D , Uma Devi K S

**Algorithms:**

* Machine Learning models such as SVM, Decision Trees, Linear Regression and Resilient BP were trained on the dataset
* Their accuracy was measured. The ML algorithms were also compared and contrasted in light of the particular data.
* We were able to achieve desirable accuracy and predict the UPDRS scores in the expected way.
* The limitations of the current work would be that no matter how automated the process of Parkinson’s prediction becomes, there still will be a need for human intervention, intelligence and experience to make the diagnosis an accurate one.

# [2] Prediction of Parkinson's Disease using Machine Learning and Deep Transfer Learning from different Feature Sets

**Authors:**

* + - Supriya Kamoji(Fr. Conceicao Rodrigues College of Engineering, Mumbai, India)
    - Dipali Koshti(Fr. Conceicao Rodrigues College of Engineering, Mumbai, India)
    - Valiant Vincent Dmello(Fr. Conceicao Rodrigues College of Engineering, Mumbai, India)
    - Alrich Agnel Kudel(Fr. Conceicao Rodrigues College of Engineering, Mumbai, India)
    - Nash Rajesh Vaz(Fr. Conceicao Rodrigues College of Engineering, Mumbai, India)

# [3] A Comparative Analysis of Parkinson Disease Prediction Using Machine Learning Approaches

**Authors:**

* + F.M.Javed Mehedi Shamrat(European University of Bangladesh)
  + Md.Asaduzzaman Asad(Daffodil International University)
  + A.K.M. Sazzadur Rahman(Daffodil International University)
  + Raja Tariqul Hasan Tusher(Daffodil International University)

**Algorithms:**

* Utilized three AI methods for the detection of Parkinson disease datasets.
* SVM, KNN, and LR were utilized for the forecast of Parkinson Disease.
* The exhibition of the classifiers was assessed via recall, precision, f1 extent, and precision.
* SVM shows the accuracy level of 100% for Parkinson disease prediction.
* LR achieved the second-highest classification accuracy of 97%.
* KNN acquired the worst performance (i.e. 60%)

# [4] Longitudinal clustering analysis and prediction of Parkinson’s disease progression using radiomics and hybrid machine learning

# Authors:

# Mohammad R. Salmanpour1,2

# Mojtaba Shamsaei1

# Ghasem Hajianfar3

# Hamid Soltanian-Zadeh4,5

# Arman Rahmim2,6

# Algorithms::

# PD-subjects derived from longitudinal datasets (years 0, 1, 2 & 4; Parkinson’s Progressive Marker Initiative).

# Extracted and analyzed 981 features, including motor, non-motor, and radiomics features extracted for each region-of-interest .

# Identified optimal longitudinal trajectories using hybrid machine learning systems

# Included principal component analysis (PCA) + K-Means algorithms (KMA) followed by Bayesian information criterion (BIC), Calinski-Harabatz criterion (CHC), and elbow criterion (EC)

# This study moves beyond cross-sectional PD subtyping to clustering of longitudinal disease trajectories. We conclude that combining medical information with SPECT-based radiomics features, and optimal utilization of HMLSs, can identify distinct disease trajectories in PD patients, and enable effective prediction of disease trajectories from early year data.

# [5]Predicting Parkinson’s Disease Progression: Evaluation of Ensemble Methods in Machine Learning

# Authors:

# Rabab Ali Abumalloh

# Behrouz Minaei-Bidgoli

# Sarminah Samad

# Muhammed Yousoof Ismail

# Ashwaq Alhargan

# Waleed Abdu Zogaan

# Algorithms:

# This study uses both unsupervised and supervised learning techniques to diagnose PD through UPDRS prediction.

# Several approaches that entail clustering, reducing dimensionality, and learning of prediction approaches are used to create the PD diagnoses method.

# Several approaches that entail clustering, reducing dimensionality, and learning of prediction approaches are used to create the PD diagnoses method.