Parkinson's Disease Early Detection Model

Team 41 - Last Minute Rankers
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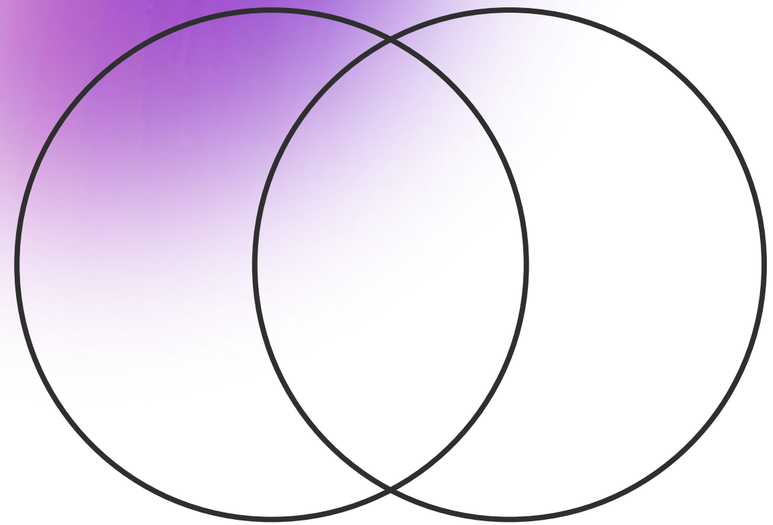
Problem Statement:

Difficulty in Early Diagnosis
Early symptoms are often subtle and can be mistaken for other conditions, delaying diagnosis and treatment.

Limited Diagnostic Tools
Current diagnostic methods rely heavily on clinical assessments, which can be subjective and prone to errors.

Timely Intervention is Crucial
Early detection enables timely interventions and therapies that can slow disease progression and improve quality of life.

Proposed Solution:

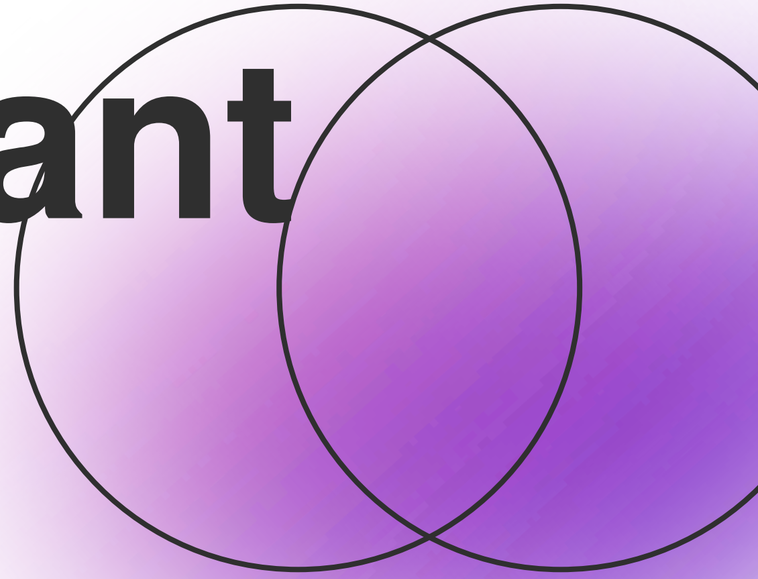


Leveraging Machine Learning to Enable Early Detection-

Data-Driven Approach
Machine learning models can analyze large datasets of clinical and biological markers to identify subtle patterns indicative of Parkinson's.

Improved Accuracy and Sensitivity
Machine learning algorithms can detect patterns that may be missed by human observation, leading to more accurate and sensitive diagnoses.

Gathering Relevant Clinical Data



Data Sources

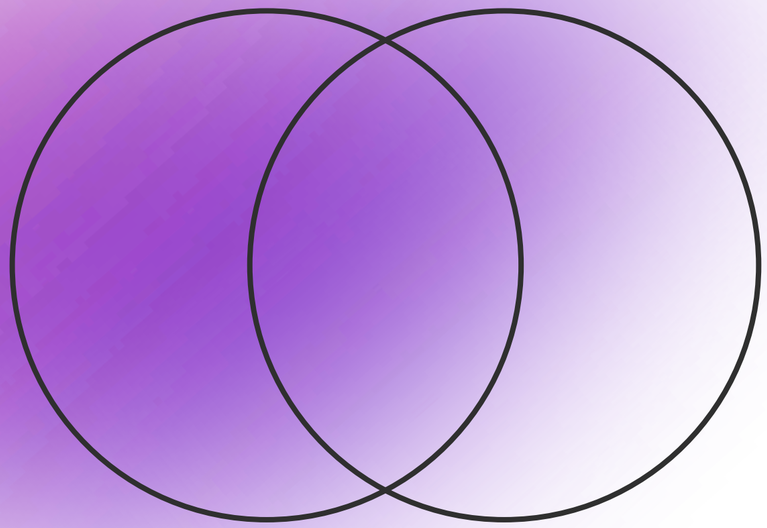
The data is sourced from the UCI Machine Learning Repository and consists of audio recordings from both Parkinson's patients and healthy individuals.

Data Cleaning and Integration

Data quality is essential for accurate model training. Missing values are handled, inconsistencies are resolved, and data from multiple sources are combined.

Feature Engineering

Relevant features are extracted from raw data, transforming it into a format suitable for machine learning algorithms.



Model Architecture

Using Multiple Models to Test Accuracy

Support Vector Machines (SVMs)
SVMs are effective for classification tasks, identifying patterns in high-dimensional data, and separating distinct groups.

K Nearest Neighbour
K-Nearest Neighbors (KNN) is a simple, non-parametric algorithm that classifies data points based on the majority class of their k nearest neighbors in the feature space.

Random Forests
Random forests combine multiple decision trees to improve accuracy and reduce overfitting, providing robust predictions.

Results and Performance Metrics

Metric	Value
Accuracy	94%
ROC AUC Score	90%

What Makes it UNIQUE?

predict Parkinson's risk with just an audio recording

The Model extracts key audio features (jitter, shimmer, etc.) from recordings to predict Parkinson's likelihood.

Potential Impact:

Improving Patient Outcomes Through Early Intervention

Enhanced Treatment Options

Early diagnosis allows for timely and effective treatment, potentially slowing disease progression and improving quality of life.

Accelerated Research

This model facilitates research by providing insights into the early stages of Parkinson's, accelerating the development of new therapies.

Empowering Patients

Early detection can empower individuals to manage their condition proactively, increasing their sense of control and well-being.

Thank You