# ICP 5 Report

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## Introduction

This report presents the results of applying PCA-based dimensionality reduction followed by classification using multiple classifiers on the Parkinson's disease speech dataset. The dataset was evaluated using 3-fold, 5-fold, and 7-fold cross-validation for each model. The classifiers used include Random Forest, Logistic Regression, Perceptron, and K-Nearest Neighbors (KNN). RandomizedSearchCV was used to tune hyperparameters.

## Random Forest

Results of Random Forest with 3-fold, 5-fold, and 7-fold cross-validation:

A screenshot of a computer

AI-generated content may be incorrect.

## Logistic Regression

Results of Logistic Regression with 3-fold, 5-fold, and 7-fold cross-validation:

A screenshot of a computer

AI-generated content may be incorrect.

## Perceptron

Results of Perceptron with 3-fold, 5-fold, and 7-fold cross-validation:

A screenshot of a computer program

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## K-Nearest Neighbors (KNN)

Results of K-Nearest Neighbors (KNN) with 3-fold, 5-fold, and 7-fold cross-validation:

A screenshot of a computer

AI-generated content may be incorrect.

## Conclusion

Across the different classifiers and folds, the test set accuracy varied slightly, showing the impact of model and parameter tuning. Random Forest showed consistently high performance across all cross-validation strategies. Logistic Regression and KNN also gave reliable results, while Perceptron exhibited slightly lower accuracy. PCA helped reduce dimensionality and improve training efficiency.

Video Recording link:

<https://drive.google.com/file/d/1K54NPiISCZ8GsOfAjAHaLS3YptbicYPo/view?usp=drive_link>