

Flower Classification Project

Project Overview

This project explores machine learning classification by implementing algorithms to classify iris flower species based on their physical characteristics. It uses the fisheriris dataset and applies models such as K-Nearest Neighbors (KNN) and Support Vector Machines (SVM).

A graphical user interface (GUI) was developed in MATLAB to enable interactive model selection, training, and evaluation.

Key Features

- Machine Learning Models:
 - KNN: A lazy learning algorithm that classifies based on the majority vote of the nearest neighbors.
 - SVM: A supervised learning model that identifies a hyperplane to optimally separate categories.
- Interactive GUI:
 - Load datasets for training and testing.
 - Choose between KNN and SVM for classification.
 - Train models and evaluate their accuracy on test data.
 - Visualize data with customizable scatter plots.

Connection to my study

As a biomedical engineering student, this project demonstrates the application of signal processing and data analysis techniques to real-world problems. Here's how it connects to my studies:

- Data Processing: The methods used to analyze flower data are transferable to processing physiological signals like ECG or EEG.
- Machine Learning: The algorithms implemented here can classify medical conditions, such as arrhythmias or diseases, based on patient data.
- Visualization: Designing user-friendly interfaces and visualization tools is essential in medical technologies to interpret complex datasets effectively.

Learning Outcomes

- Gained hands-on experience with MATLAB's Classification Learner App.
- Improved understanding of supervised learning algorithms and their practical use.
- Developed skills in building GUIs for data interaction and visualization.

Tools & Technologies

- MATLAB: Programming language and environment for numerical computation.
- Statistics and Machine Learning Toolbox: Used for training and evaluating machine learning models.
- fisheriris Dataset: A well-known dataset used to train and test classification models.

Getting Started

1. Load the project files in MATLAB.
2. Use the GUI to load training and testing datasets.
3. Select a classifier (KNN or SVM) and train the model.
4. Test the model and plot the results using the interactive tools.

Connect With Me

✦ For more details about my projects and background, check out my LinkedIn profile:
[Shahar Argil](<https://www.linkedin.com/in/shahar-argil/>)

☀ This project reflects my interest in leveraging signal processing and machine learning to solve challenges in biomedical engineering and improve healthcare outcomes.

Appendices

