Hude Hude (hh3024)

README

Description

This project implements **one-vs-all logistic regression** to classify the three Iris species (*Setosa*, *Versicolor*, *Virginica*) using mean and variance of the four features from the Iris dataset. It includes separate classifiers for each species, predicting whether a sample belongs to a specific species or not.

Files

- **`one_vs_all_log.m`**: Main script that loads the trained models, evaluates the classification on the test set, and computes performance metrics (confusion matrix, precision, recall, F1-score, accuracy).
- **`Setosa_vs_all_classify.m`**: Trains a logistic regression classifier to differentiate Setosa from the other two species.
- **`Versicolor_vs_all_classify.m`**: Trains a logistic regression classifier to differentiate Versicolor from the other two species.
- **`Virginica_vs_all_classify.m`**: Trains a logistic regression classifier to differentiate Virginica from the other two species.

Running the Code

1. **Train the Classifiers**:
    - Run each classification script (`Setosa_vs_all_classify.m`, `Versicolor_vs_all_classify.m`, `Virginica_vs_all_classify.m`) to train the models and save the parameters.
2. **Evaluate the Models**:
    - Run `one_vs_all_log.m` to load the trained models, predict the species for the test data, and evaluate the model's performance using the confusion matrix, precision, recall, F1-score, and accuracy.

Dependencies

- MATLAB with `fmincon` optimization function.
- Iris dataset (`iris.mat`), included in the MATLAB distribution.

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Notes

- The logistic regression classifiers are trained on the mean and variance of the features. Future improvements could explore using all four original features for better accuracy.
- Ensure all files are in the same directory when running the code.