CS3244 Project – Group 4

FashionMNIST Image Dataset

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A machine learning and deep learning project developed for CS3244, designed to classify FashionMNIST dataset using multiple models. Runs on both Google Colab and Local Conda environments.

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Environment Setup

Google Colab:

- No installation needed. Just open chosen ipynb file and run the notebook in Google Colab.

Local (Conda Environment):

To replicate the environment locally, use:

conda create --name <envname> --file requirements.txt

If some packages are missing in your Python environment, you may encounter import errors. Install them manually or use the command above.

Directory Structure

Your dataset should be placed in the following structure:

/src/

/data/

├── **fashion-mnist_train.csv**

└── **fashion-mnist_test.csv**

How to Run the Code

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1. Prepare Dataset

- Place your data in /data as above.

2. (Optional) Exploratory Data Analysis and Feature Extraction

- Run “Visualisation.ipynb” for general distribution and EDA

- Run the “feature_extraction.ipynb” for visualizing HOG and SIFT feature extraction.

- Run “PCA.ipynb” for visualizing PCA of the dataset

3. Model Training & Evaluation

- Run ML or DL model file {xxx.ipynb} which includes all the steps including data preprocess to training and evaluation

Additional Information

- Classical ML code is organized by model type. Within the model file, to test different dataset, simply comment/uncomment the code blocks you need.

- All results and evaluation of each model are already printed and output within the ipynb already; however, it can be run again to verify the given result.

- The codebase is modular and designed to allow quick testing and experimentation with different model and dataset combinations.