Project Structure

Please organize your dataset in a folder named dataset, with each class stored in its own subfolder. The general structure should look like this:

```
project_root/
├── dataset/
│   ├── class_1/
│   ├── class_2/
│   └── ...
├──    Code
│        ├──classifier_training.py     # Script for training the model
│        ├── tune.py                  # Script for hyperparameter tuning
│        ├── predict.py               # Script for making predictions
│        └── requirements.txt         # Required Python packages
└──    Model
         └── classifier_model.pth    # Model
```

Necessary Installations

All required packages are listed in the requirements.txt file. Install them using the following command:

python -m venv venv

./venv/Scripts/activate # Note different for windows and linux

pip install -r requirements.txt

Training the Model

To train the classifier, simply run the classifier_training.py script:

python classifier_training.py

The script uses optimized default parameters based on prior hyperparameter tuning.

Hyperparameter Tuning

To reproduce the hyperparameter tuning process, run the tune.py script:

python tune.py

Ensure that tune.py is in the same directory as classifier_training.py, as it relies on this file for model training during the tuning process.

Making Predictions

To generate predictions on new images, execute the predict.py script from the command line:

python predict.py --model path/to/model --image path/to/image

You can specify the model you'd like to use by providing the appropriate .pth file. For our trained model, please use classifier_model.pth from the models folder.

For more information about the script,

python predict.py --help

can be run.