

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/
│   └── ...
├── classifier_training.py    # Script for training the model
├── tune.py                  # Script for hyperparameter tuning
├── predict.py               # Script for making predictions
├── classifier_model.pth     # Saved trained model
└── requirements.txt         # Required Python packages
```

Necessary Installations

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

```
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
```

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.