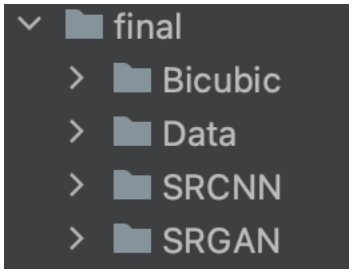
Super Resolution – Chenxi Yao, Yuanrun Xu
Python Project

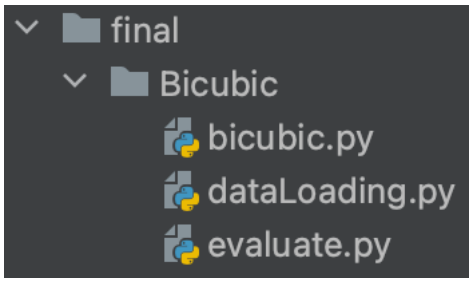
1. Project Overview

The project contains 4 folders:

- Bicubic: code of Bicubic interpolation
- Data: contains DIV2K dataset
- SRCNN: code and model of SRCNN
- SRGAN: code and model of SRGAN

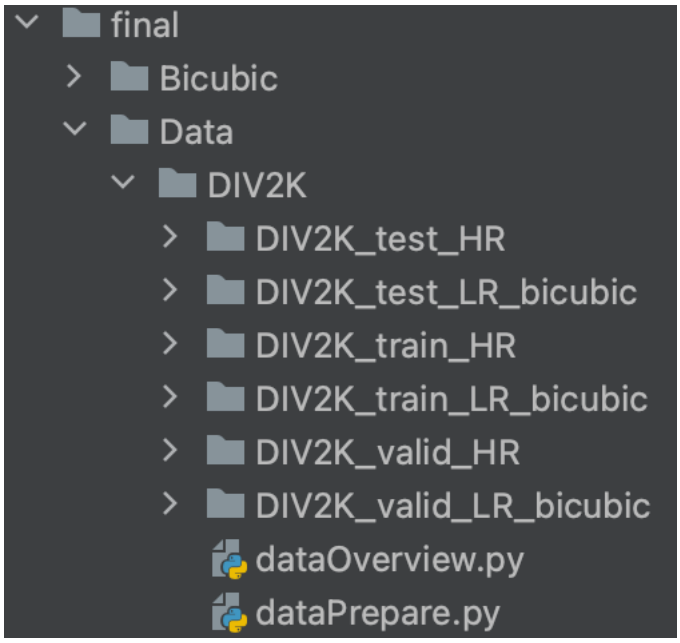


1.1 Bicubic



- Bibubic.py: apply Bibubic interpolation by using cv2.INTER_CUBIC to the loading data.
- dataLoading.py: load train, validation, and test dataset from the Data folder
- evaluate.py: methods of calculating SNR, PSNR, and SSIM.

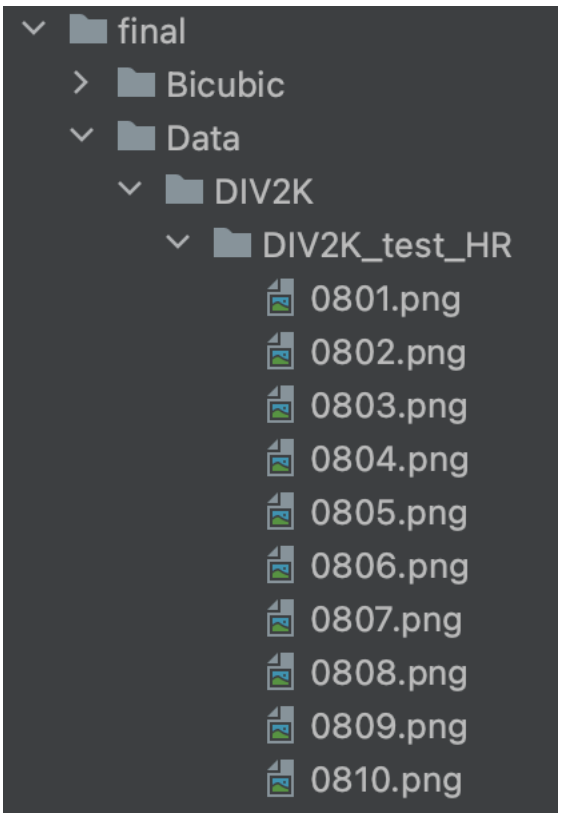
1.2 Data



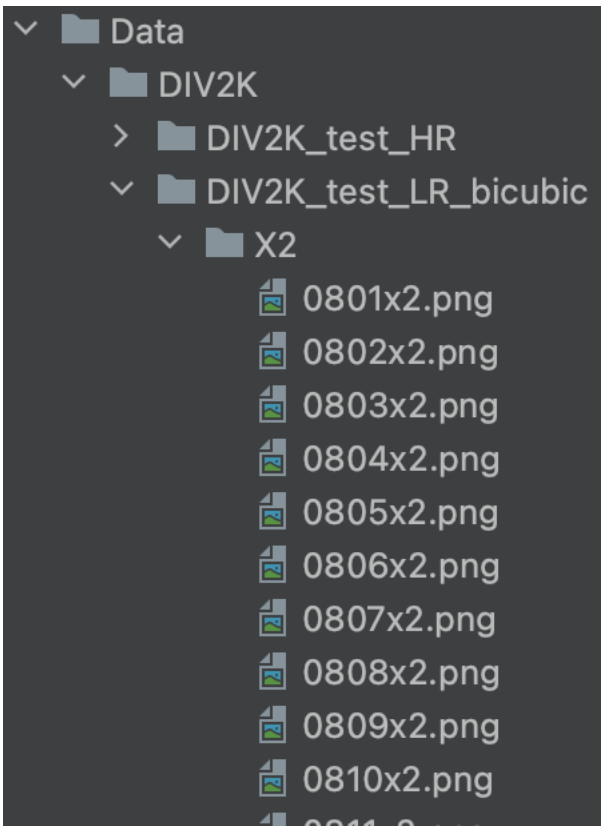
Data folder contains a folder named DIV2K. DIV2K contains the train, validation, and test

dataset.

Images are directly in HR folders: DIV2K_test_HR, DIV2K_train_HR, and DIV2K_valid_HR:



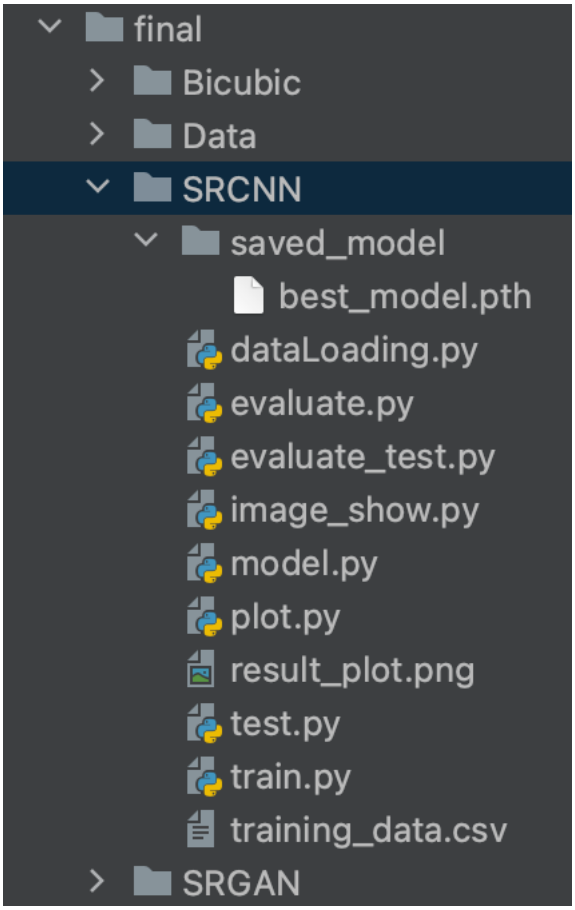
However, images in LR folders are under a sub-folder named X2:



- dataOverview.py: shows the overview of the dataset:

- dataPrepare.py: split and rename the images:

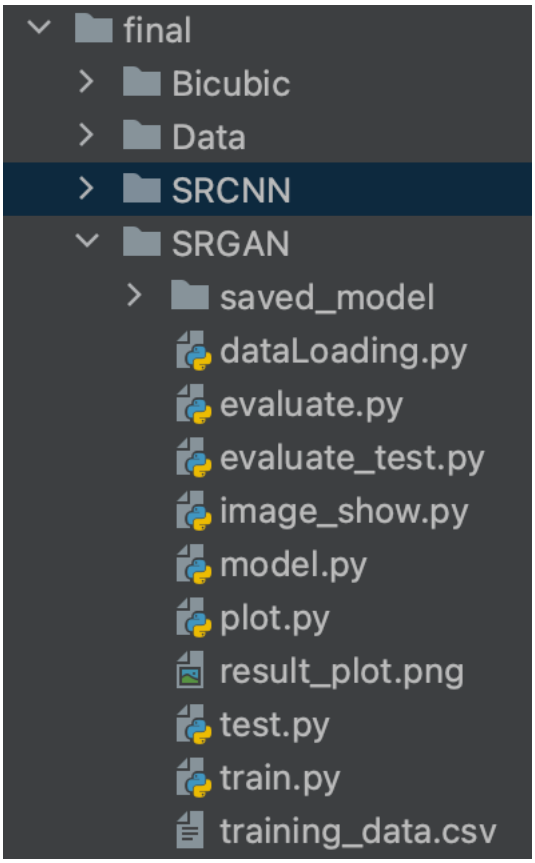
1.3 SRCNN



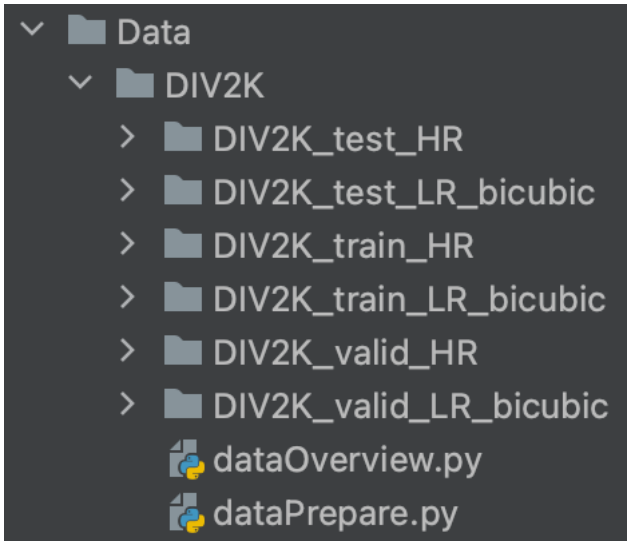
- saved_model folder contains the trained model.
- dataLoading.py: dataLoading.py: load train, validation, and test dataset from the Data folder
- evaluate.py: methods of calculating SNR, PSNR, and SSIM; and method of calculating these metrics during training.
- evaluate_test.py: above during testing; call image_show() to show the output images.
- Image_show.py: method to show the output images
- model.py: define the class SRCNN
- plot.py: plot the training curves
- test.py: test the model after training
- train.py: train the model

1.4 SRGAN

The structure of SRGAN folder is the same as SRCNN.



2. Deployment
   - Put the split DIV2K dataset into the Data folder:
     Train:valid:test 5:3:1

   - Bicubic interpolation:
     Run bicubic.py
   - SRCNN
     Training: run train.py; if the saved_model folder does not exist, it will be created automatically before training; the model will be saved to the folder. Training curves will be saved to SRCNN folder after training.

Testing: run test.py. LR, HR, and output images will be shown after testing.

- SRGAN: the same as SRCNN