

## VRDL HW4 - Image Super Resolution

Author: Yun-Ju, Ho (何昀儒)

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### GitHub link

[https://github.com/LordHo/VRDL\\_HW4.git](https://github.com/LordHo/VRDL_HW4.git)



### Introduction

Image super-resolution is a task that restore image from low resolution. It can use in surveillance, medical, media, and ...etc. In medical, capturing high-resolution MRI images can be tricky, so deep learning can use to get better resolution image and less time. Same in media, we can transport low media low-resolution frames but enjoy high-resolution video.



### Dataset

[https://drive.google.com/file/d/1GL\\_Rh1N-WjrvF\\_-YOKOyvq0zrV6TF4hb/view](https://drive.google.com/file/d/1GL_Rh1N-WjrvF_-YOKOyvq0zrV6TF4hb/view)

This dataset include 291 HR image for training and 14 LR image for testing.



### Environment

OS: Window 10

GPU: Nvidia GeForce RTX 2080 Ti

Framework: Pytorch



### Methodology

#### **Data Pre-process**

Only need to provide HR image , and corresponding LR image will produce automatically with matlab bicubic.

#### **Model architecture**

Please reference "SwinIR: Image Restoration Using Swin Transformer"[3] to know the whole model detail.

#### **Hyperparameters**

Optimizer: Adam

Optimizer lr: 2e-4

Loss: L1



## Result

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My final score of PSNR is 27.8064 by SwinIR. It beat the baseline of this homework by VDSR[5] with PSNR is 27.4162.



## Summary

In this homework, I use SwinIR as my model and easy to train and to eval by command provide by KAIR. It only need to provide HR image and LR image will provide automatically for training and calculate PSNR for eval (test) image.



## Reference

[1] KAIR

[https://github.com/cszn/KAIR/blob/master/docs/README\\_SwinIR.md](https://github.com/cszn/KAIR/blob/master/docs/README_SwinIR.md)

[2] SwinIR

<https://github.com/jingyunliang/swinir>

[3] "SwinIR: Image Restoration Using Swin Transformer"

<https://arxiv.org/pdf/2108.10257v1.pdf>

[4] "2021 VRDL HW4 Super Resolution"

[https://codalab.lisn.upsaclay.fr/competitions/622?secret\\_key=4e06d660-cd84-429c-971b-79d15f78d400#results](https://codalab.lisn.upsaclay.fr/competitions/622?secret_key=4e06d660-cd84-429c-971b-79d15f78d400#results)

[5] "VDSR, Kim etal. CVPR'16"

[https://cv.snu.ac.kr/research/VDSR/VDSR\\_CVPR2016.pdf](https://cv.snu.ac.kr/research/VDSR/VDSR_CVPR2016.pdf)

[6] "Image Super-Resolution on paperwithcode.com"

<https://paperswithcode.com/task/image-super-resolution>