Selected Topics in Visual Recognition using Deep Learning
Homework 4 announcement

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Homework 3 reminder

- **Deadline: Dec. 16, 23:59**
  1. Finish the competition (check if your ID on the leaderboard)

Results					
#	User	Entries	Date of Last Entry	Team Name	mAP ▲
1	luluhoooo	2	11/03/21	baseline	0.39199 (1)

  2. Upload your reports in PDF format to **E3 system**
     - Naming rule: VRDL_HW3_{**STUDENT ID**}_Report.pdf

HW4 Timeline

- **Deadline: 01/13, Thr at 23:59** (You have 4 weeks to compelete HW4)
- Finish the competition (check if your ID on the leaderboard)

Results					
#	User	Entries	Date of Last Entry	Team Name	mAP ▲
1	luluhoooo	2	11/03/21	baseline	0.39199 (1)

- Upload your reports in PDF format to **E3 system**
  - Naming rule: VRDL_HW4_{**STUDENT ID**}_Report.pdf

HW4 Introduction: Image super resolution

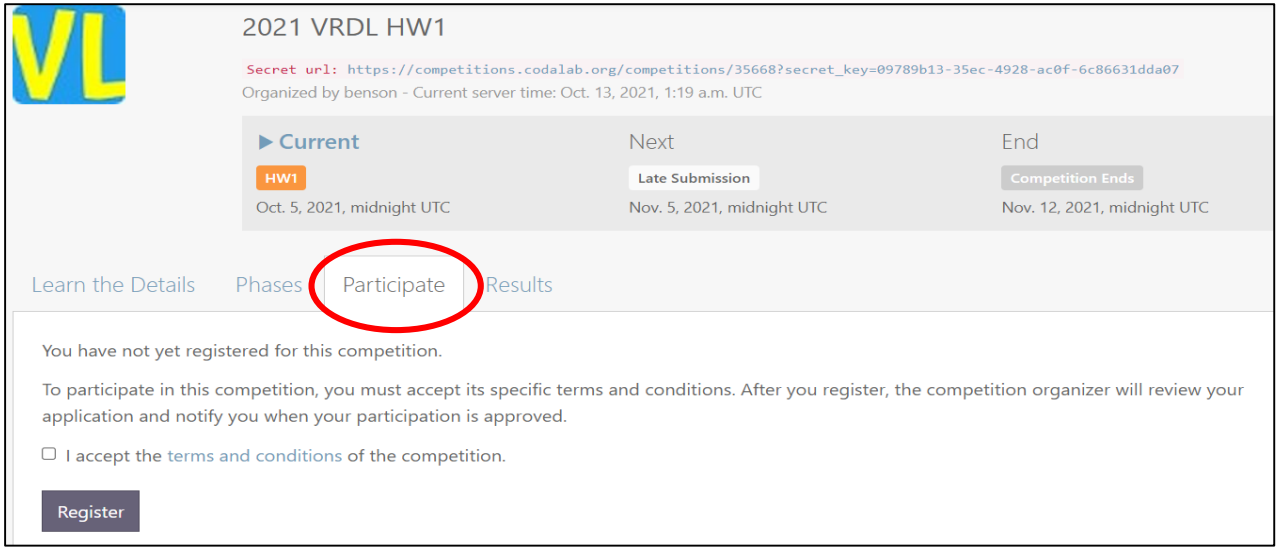
- Dataset
  - Training set: 291 high-resolution images
  - Testing set: 14 low-resolution images
- Train your model to reconstruct a high-resolution image from a low-resolution input
- Pre-trained model is NOT allowed

low-resolution image

high-resolution image

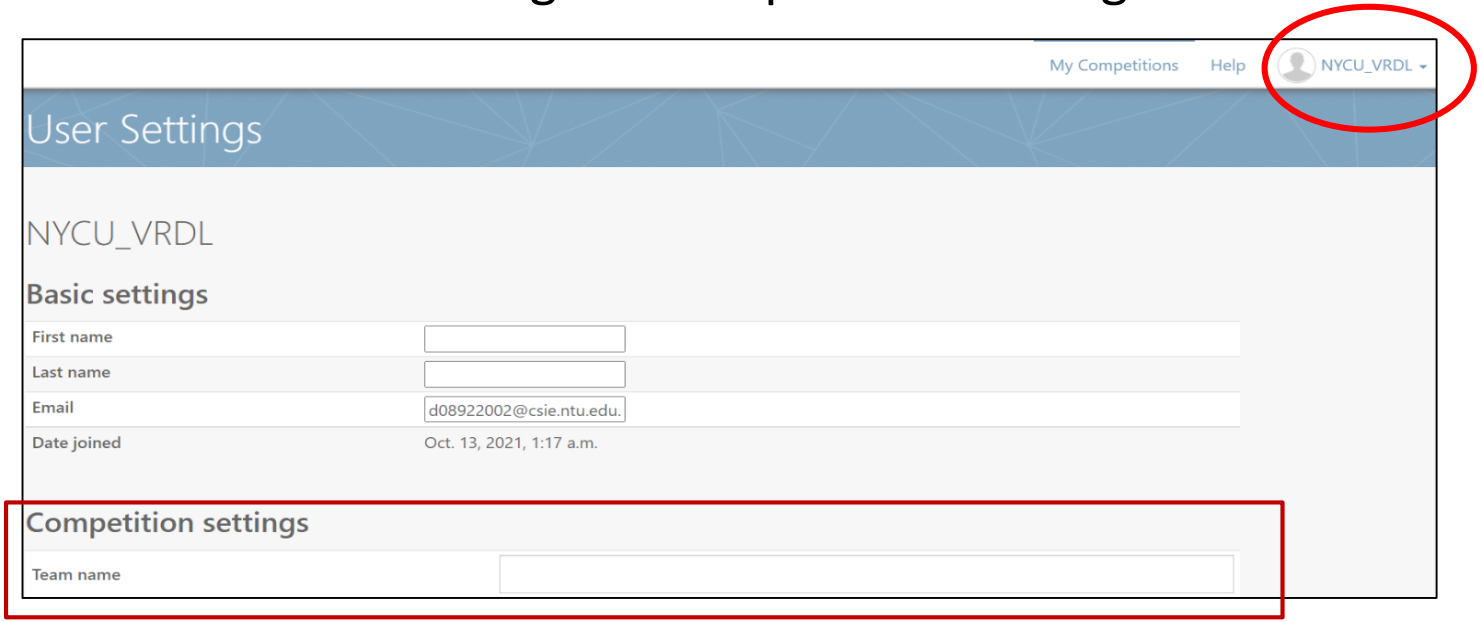
CodaLab competition: Sign in

- Competition link
- Sing in and participate the competition



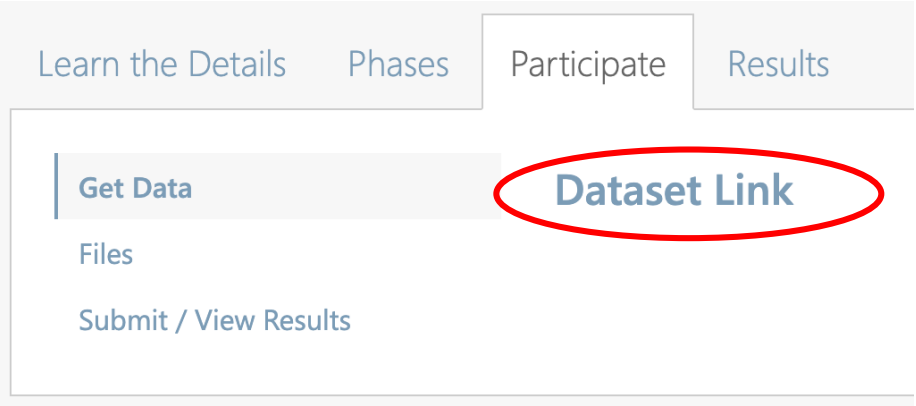
CodaLab competition: Team name

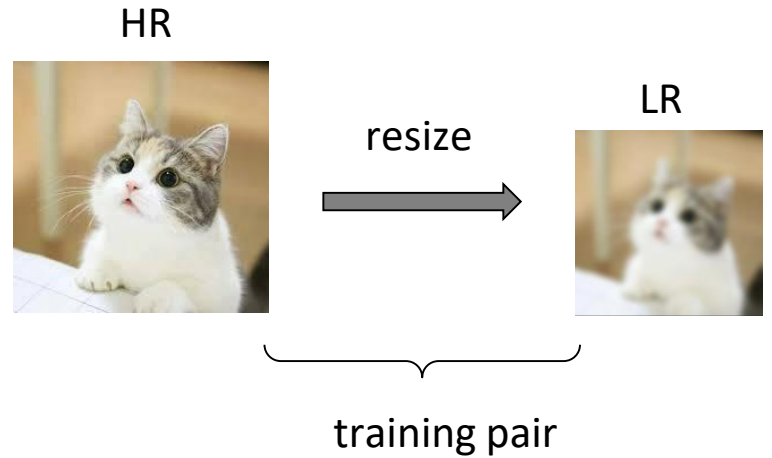
- Change your team name into your **Student ID**!
  - Account -> Settings -> Competition settings -> Team name



CodaLab competition: Download dataset

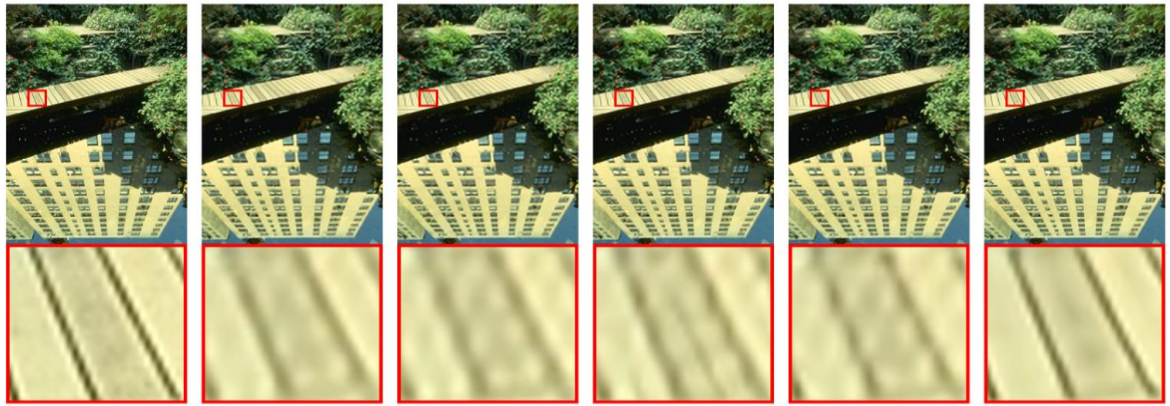
- Download the dataset from CodaLab competition
- There is no annotation in the image super-resolution task. You need to manually generate the HR-LR image training pairs by the provided HR images





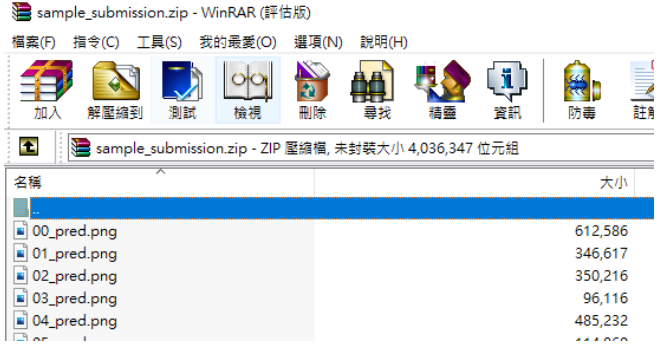
Evaluation metrics: PSNR

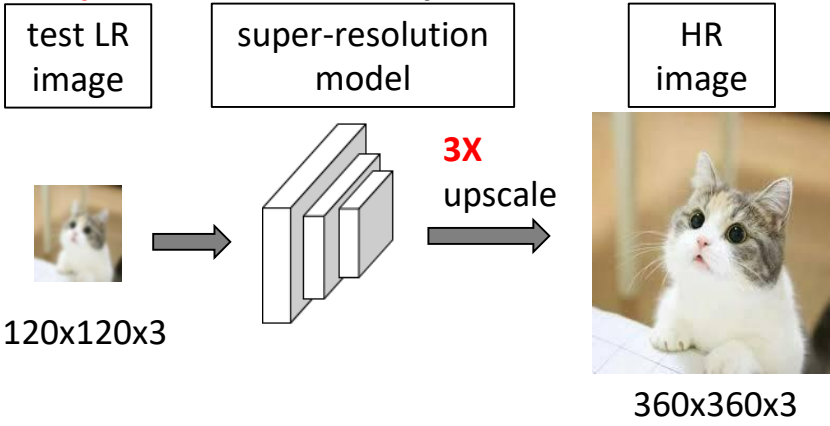
- Peak signal to noise ratio (PSNR) is a commonly used metric to measure the similarity between two image
- The Pre-train model is NOT allowed in this assignment.
- Baseline performance in PSNR: **27.4162**



CodaLab competition: Create submission

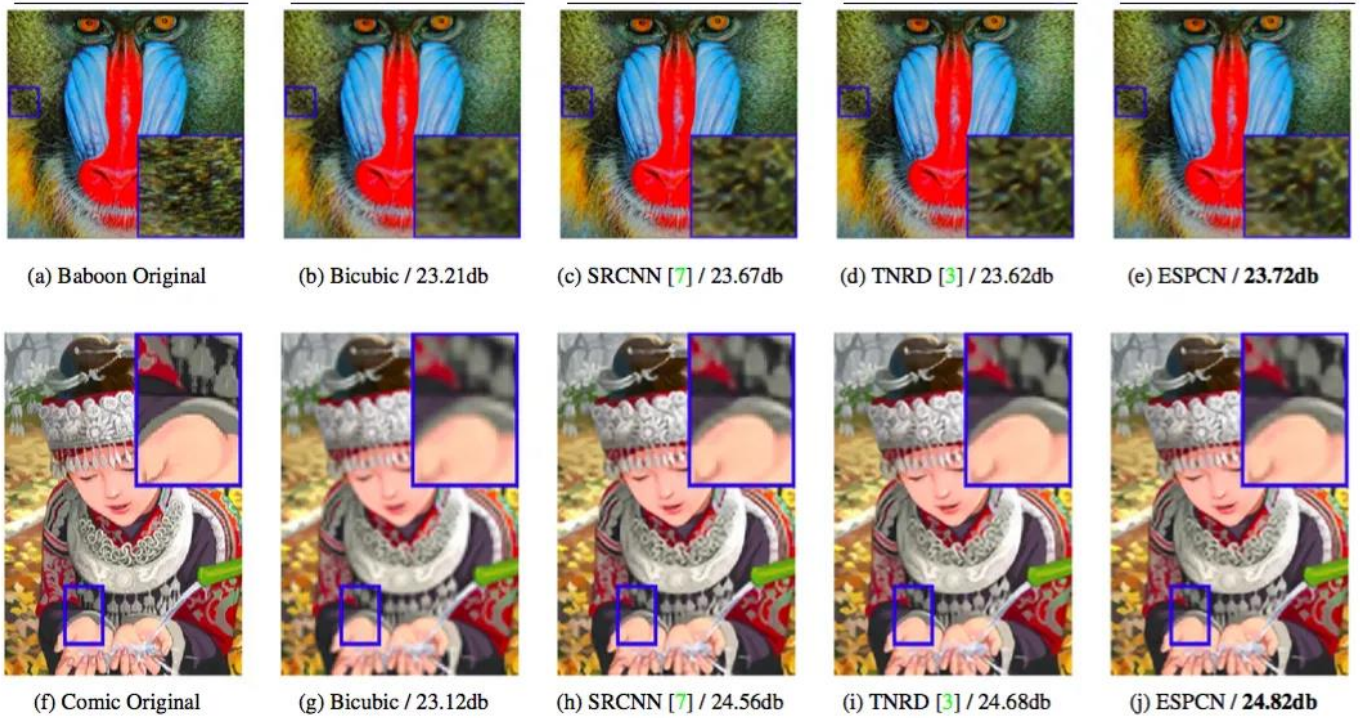
- Please upscale the test images with an upscaling factor of **3**, e.g., 120 x 120 -> 360 x 360
- The results should be named as {test_img_name}_pred.png and compress in ZIP file, e.g. the result of “00.png” should be “00_pred.png”
- Directly compress the images into zip file, do not put them in a folder and then compress.





Grading policy: Model performance (70 points)

- Get at least 56% (70%x0.8) by scoring over the baseline



(a) Baboon Original (b) Bicubic / 23.21db (c) SRCNN [7] / 23.67db (d) TNRD [3] / 23.62db (e) ESPCN / **23.72db**

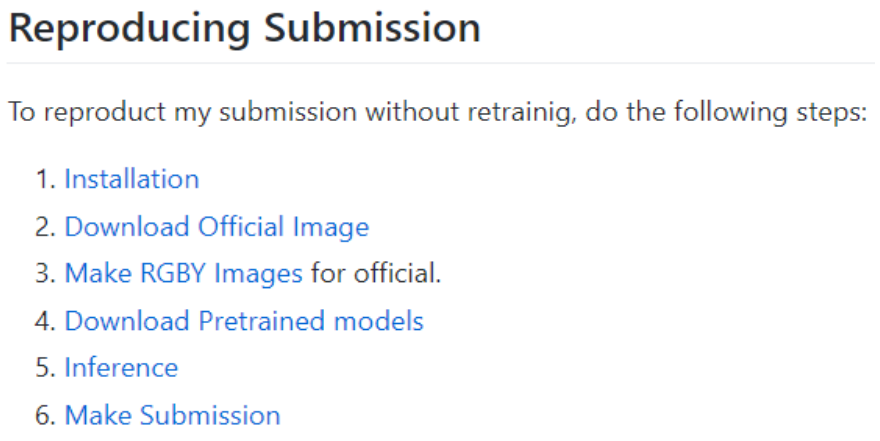
(f) Comic Original (g) Bicubic / 23.12db (h) SRCNN [7] / 24.56db (i) TNRD [3] / 24.68db (j) ESPCN / **24.82db**

Grading policy: Reports (20 points)

- Document your work (in PDF)
  - GitHub/ GitLab link of your code
  - Reference if you used code from GitHub
  - Brief introduction
  - Methodology (Data pre-process, Model architecture, Hyperparameters,...)
  - Findings or Summary

Code readability (10 points)

- Write beautiful Python code with PEP8 guidelines for readability
- Must provide
  - Downloadable link of your model weights on GitHub README
  - A inference.py/.ipynb to reproduce your submission file
- Get only half points of model performance if fail on reproducing your submission



Reproducing Submission

To reproduct my submission without retrainig, do the following steps:

1. Installation
2. Download Official Image
3. Make RGBY Images for official.
4. Download Pretrained models
5. Inference
6. Make Submission

Late Policy

- NO late submission in HW4!!!
- No score will be given if you do not submit HW4 on time

Keywords

- Beat the baseline
  - VDSR [Kim etal. CVPR'16]
  - Data-augmentation

- Rank Top 3!
  - Read the SOTA paper (image super-resolution) from PAPERs-with-codes and try to implement it!

FAQ

- Can I use any code/tools/Library from GitHub or other resources?
  - Yes! We encourage you to learn how to apply existing tools on your own task.

    But DO NOT copy code from your classmate!
- Why my testing results are so bad?
  - Make sure your submit images look good
  - Please upscale the test images with an scaling factor of **3**!

Notice

- Check your email regularly, we will mail you if there are any updates or problems of the homework
- If you have any questions or comments for the homework, please mail me and cc Prof. Lin
  - Prof. Lin: lin@cs.nctu.edu.tw
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Have fun!