



# Selected Topics in Visual Recognition using Deep Learning

## Homework 1 grading

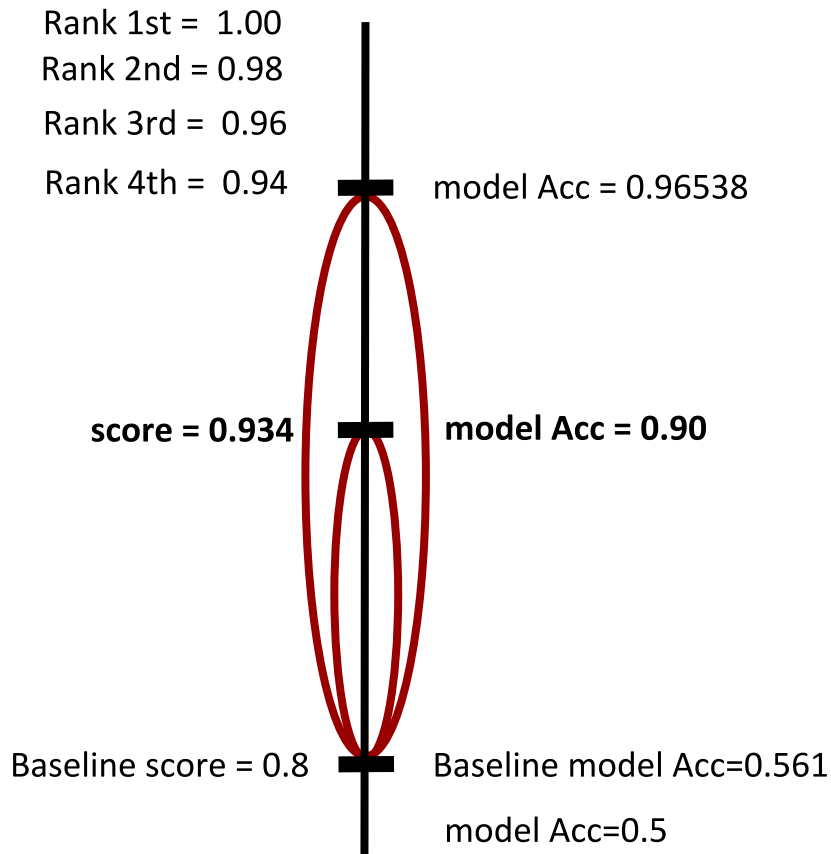
TA: 楊証琨, Jimmy

Ph.D. student at National Taiwan University

d08922002@ntu.edu.tw

# Grading policy: Model performance (70%)

- Score will be interpolated with the model accuracy by rank 4th and baseline
- If your model accuracy is 0.9, your score of model performance will be  $0.8 + ((0.90 - 0.561) / (0.965 - 0.561)) \times 0.14 = 0.917$
- $70 \text{ points} \times 0.917 = 64.22 \text{ points}$  for model performance



# Grading policy: Reports (20%)

- Document your work (**in PDF**)
  - GitHub/ GitLab link of your code
  - Brief introduction
  - Methodology (Data pre-process, Model architecture, Hyperparameters,...)
  - Findings or Summary
- If your reports include all the requirements above, you will get 20 points!



# Grading policy: Code readability (10%)

- Write beautiful Python code with [PEP8 guidelines](#) for readability. Base requirement: use whitespace correctly!

```
Python

# Recommended
def function(default_parameter=5):
    # ...

# Not recommended
def function(default_parameter = 5):
    # ...
```

```
Python

# Recommended
my_list = [1, 2, 3]

# Not recommended
my_list = [ 1, 2, 3, ]
```

```
Python

x = 5
y = 6

# Recommended
print(x, y)

# Not recommended
print(x , y)
```

- If your code use whitespace correctly, you will get 10 points!





# Selected Topics in Visual Recognition using Deep Learning

## Homework 2 announcement

TA: 楊証琨, Jimmy

Ph.D. student at National Taiwan University

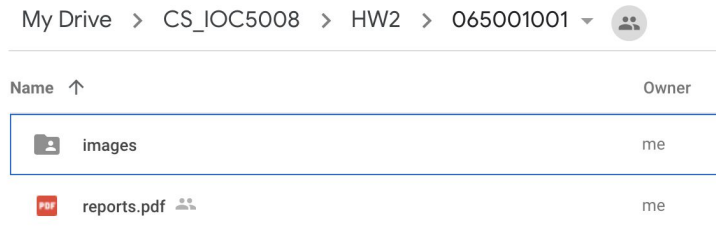
[d08922002@ntu.edu.tw](mailto:d08922002@ntu.edu.tw)

# Homework 2

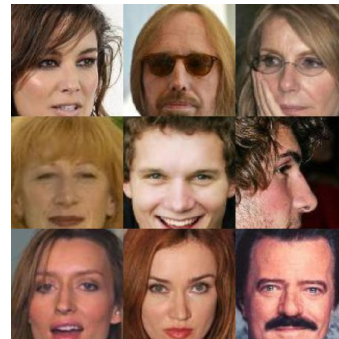
- **Deadline: 11/07, Thr at 23:59**

1. Upload your report in this  
[Google drive](#)

2. Upload 500 images generated by your model, with filename = 001\_image.png, 002\_image.png, ... , 500\_image.png



Name	Owner	Last modified	File size
000_image.png	me	3:16 AM me	103 KB
001_image.png	me	3:17 AM me	103 KB
002_image.png	me	3:14 AM me	103 KB
003_image.png	me	3:15 AM me	103 KB
004_image.png	me	3:15 AM me	103 KB
005_image.png	me	3:16 AM me	103 KB
006_image.png	me	3:17 AM me	103 KB
007_image.png	me	3:18 AM me	103 KB
008_image.png	me	3:16 AM me	103 KB
009_image.png	me	3:15 AM me	103 KB
010_image.png	me	3:15 AM me	103 KB



# HW2 Introduction

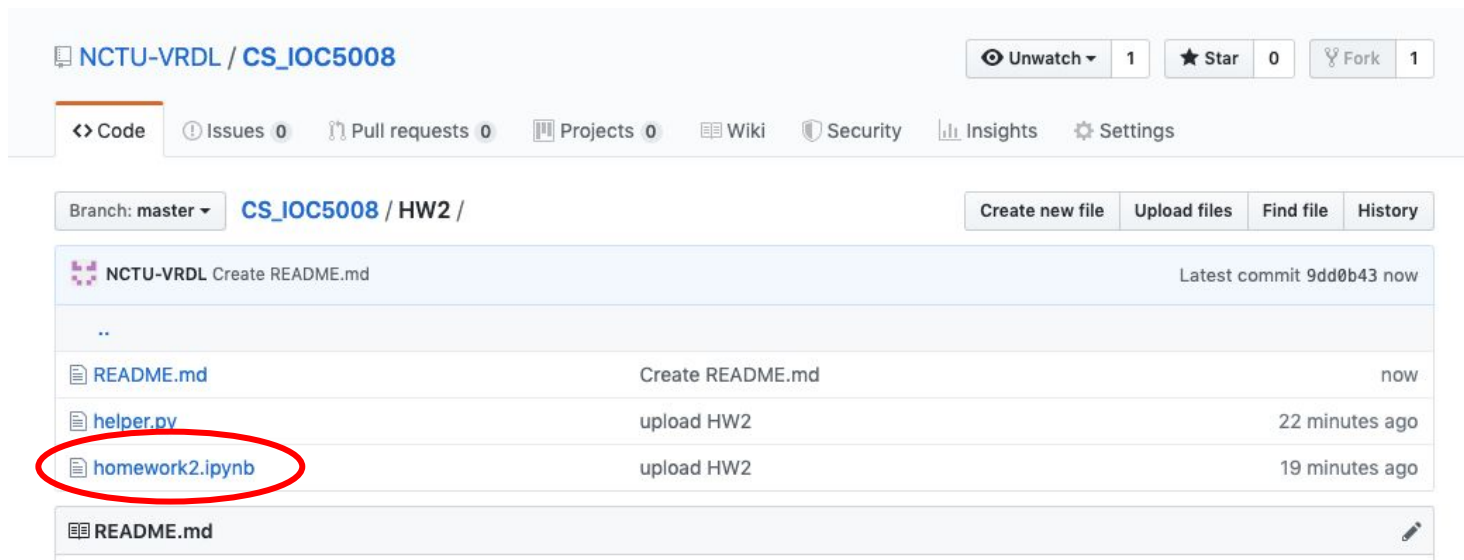
- [CelebA](#) dataset, 202,599 images, no need for annotations
- **Limits the resolution of your model output from [28, 112]**



# HW2 Prepare the dataset

- We provide code to download and extract data, please see the jupyter notebook at GitHub of this course

[https://github.com/NCTU-VRDL/CS\\_IOC5008/tree/master/HW2](https://github.com/NCTU-VRDL/CS_IOC5008/tree/master/HW2)



NCTU-VRDL / CS\_IOC5008

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NCTU-VRDL Create README.md Latest commit 9dd0b43 now

..

README.md	Create README.md	now
helper.py	upload HW2	22 minutes ago
homework2.ipynb	upload HW2	19 minutes ago

README.md





# Use the output image function to save figure

- Generate 9 images from your generative model
- save those image array into a png file
- Loop 500 times to generate 500 png file, each file contains 3x3 image



```
def output_fig(images_array, file_name="./results"):
    # the shape of your images_array should be (9, width, height, 3), 28 <= width, height <= 112
    plt.figure(figsize=(6, 6), dpi=100)
    plt.imshow(helper.images_square_grid(images_array))
    plt.axis("off")
    plt.savefig(file_name+'.png', bbox_inches='tight', pad_inches=0)
```



# Grading policy: Model performance (70%)

- Evaluated by voting from your classmates!
- Which set of images are more realistic?



# Grading policy: voting criteria

## 1. Completeness of human faces

Failure example



Good example



## 2. Variation of generated faces

Failure example



Good example

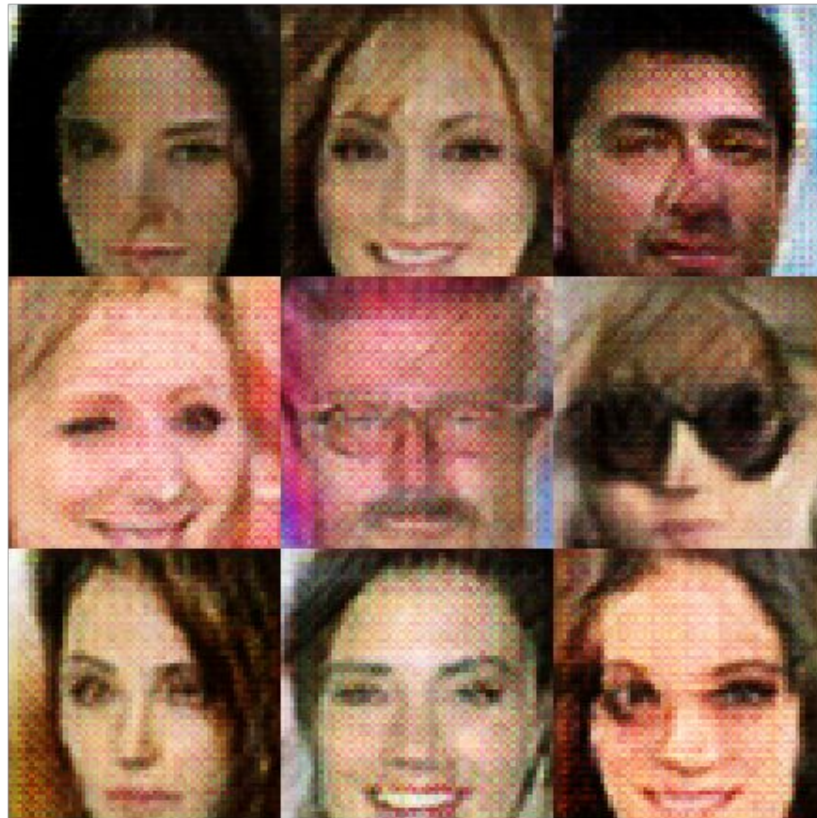


# Grading policy: Model performance (70%)

- If you performe as well as baseline, you will score 56 points ( $70\% \times 0.8$ )
- If you beat the baseline by rank 4th number of votes, you will score 65 points ( $70\% \times 0.94$ )
- Other scores will be interpolated by above scores
- We will invite three students who get the maximum votes and wrote well-document reports to give a 10 mins presentation to share your methodology



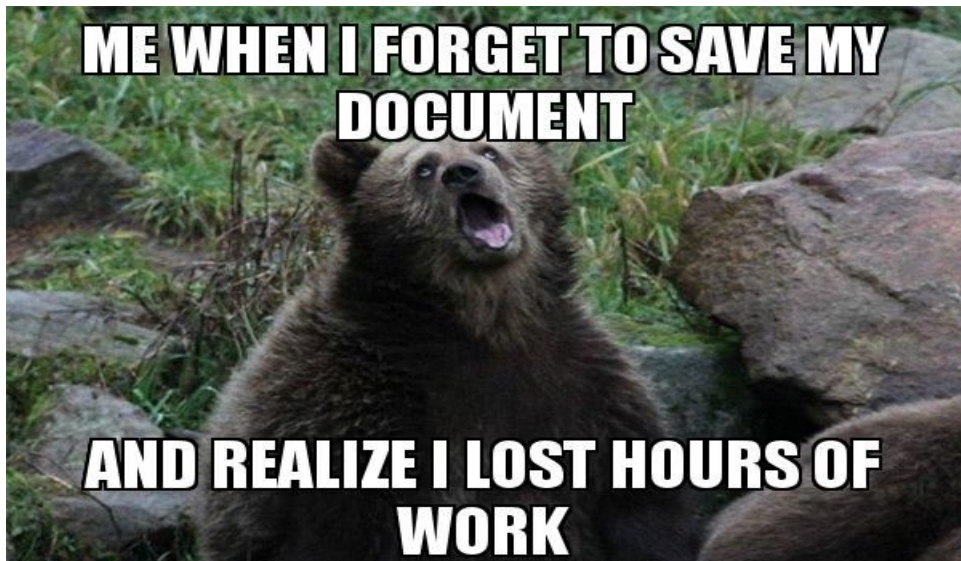
# Baseline example





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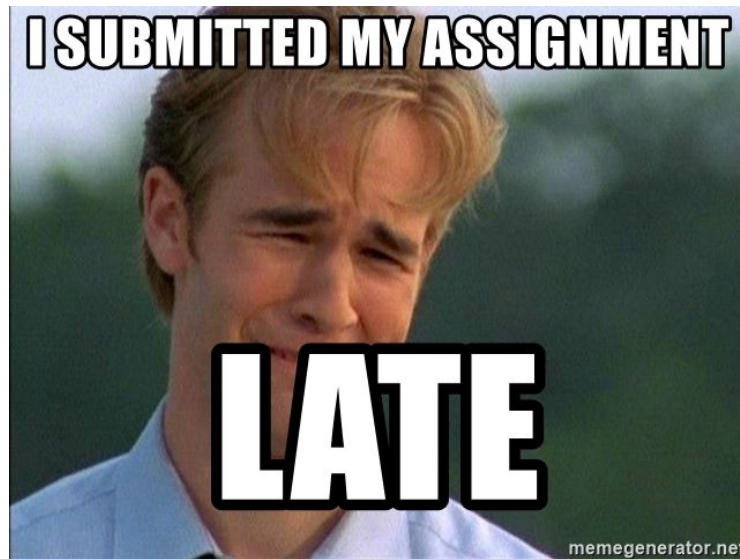
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# Late Policy

- We will deduct a late penalty of 20% per additional late day
- For example, If you get 90% of HW but delay for two days, your will get only  $90\% - (20\% \times 2) = 50\%$ !





# Keywords

- Beat the baseline
  - Basic DCGAN, Label smoothing, Proper hyperparameter setting (learning rate, optimizer)
- Rank Top 3!
  - Wasserstein GAN, BigGAN (need lots of GPU resource)



# 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, such as [Keras-GAN](#), [Pytorch-GAN](#), [TF-GAN](#)
- **But DO NOT copy code from your classmate!**
- Do I need to generate high resolution images?
  - The resolution of baseline image is 56x56, so you don't really need to generate high resolution image but you are encouraged to do so
- My GAN is not working, why?
  - Please read the [GAN-hacks](#) and check your code comprehensively



# 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](mailto:lin@cs.nctu.edu.tw)
  - Jimmy: [d08922002@ntu.edu.tw](mailto:d08922002@ntu.edu.tw)



# Have fun!

