Selected Topics in Visual Recognition using Deep Learning
Homework 1 announcement

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HW1 Timeline

- **Deadline: Nov. 4, 23:59**
  1. Finish the competition (check the leaderboard)

Download CSV	Download all submissions on leaderboard

Results				
#	User	Entries	Date of Last Entry	Team Name	Accuracy ▲
1	ChenHsuanTai	1	10/07/21	baseline	0.65579 (1)

  1. Upload your reports in PDF format to **E3 system**
- Naming rule: VRDL_HW1_{**STUDENT ID**}_Report.pdf

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HW1 Introduction: Bird images classification

- 6,033 bird images belonging to 200 bird species, e.g. tree sparrow or mockingbird (training: 3,000, test: 3,033)
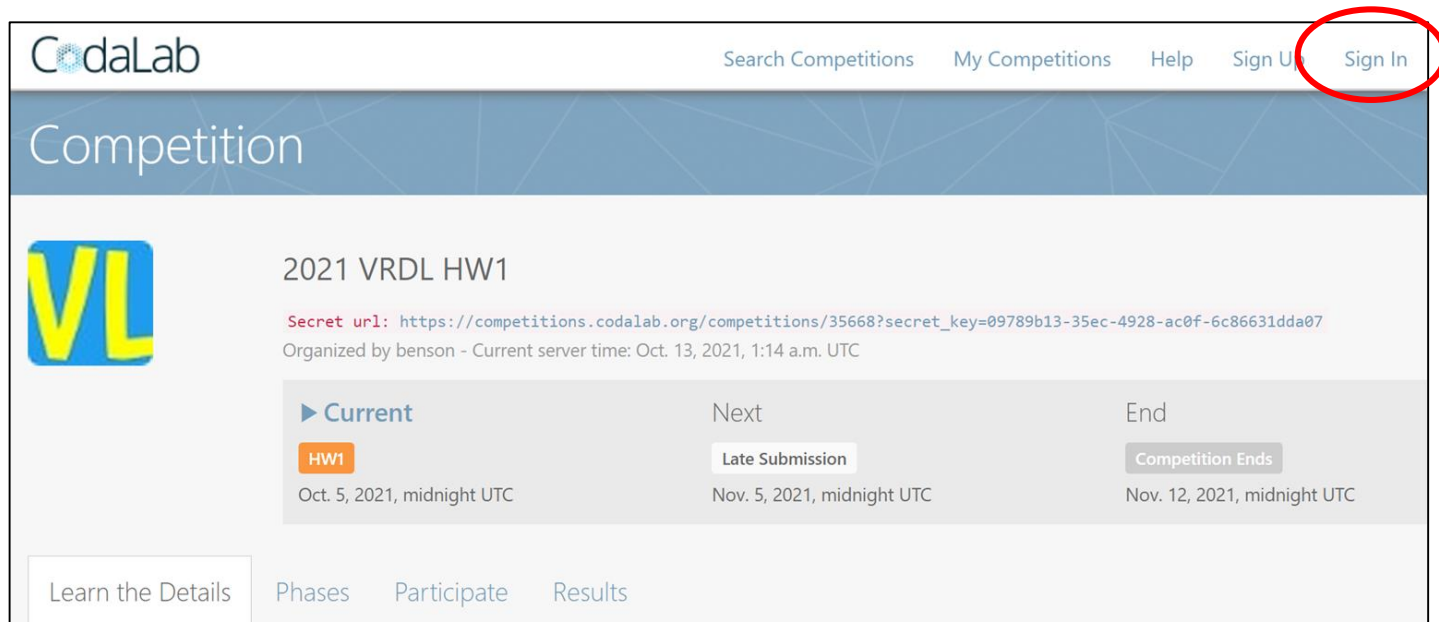- **External data is NOT allowed to train your model!**

HW1 CodaLab competition: Sign In

- HW 1 competition link:
  https://competitions.codalab.org/competitions/35668?secret_key=09789b13-35ec-4928-ac0f-6c86631dda07
- **Sing In** first! (Create an account if you don't have one)
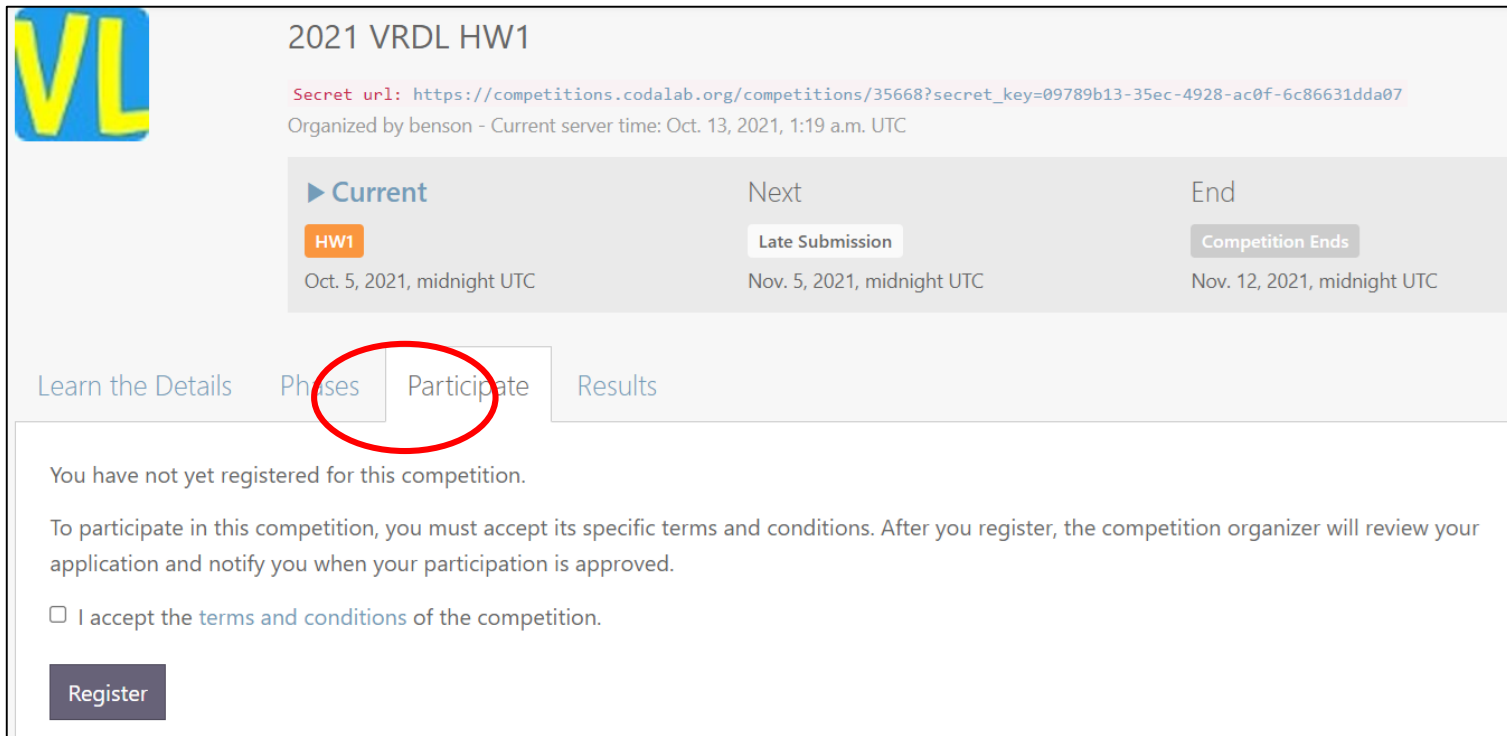
HW1 CodaLab competition: Participate

- Participate the competition

HW1 CodaLab competition: Team name

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

HW1 CodaLab competition: Download dataset

- Download the provided dataset
  - Participate -> Files -> Public Data

HW1 CodaLab competition: Create submission

- We provide a sample submission file (.zip) and the pseudo code to generate the sample submission
  - ○ Files -> Starting Kit
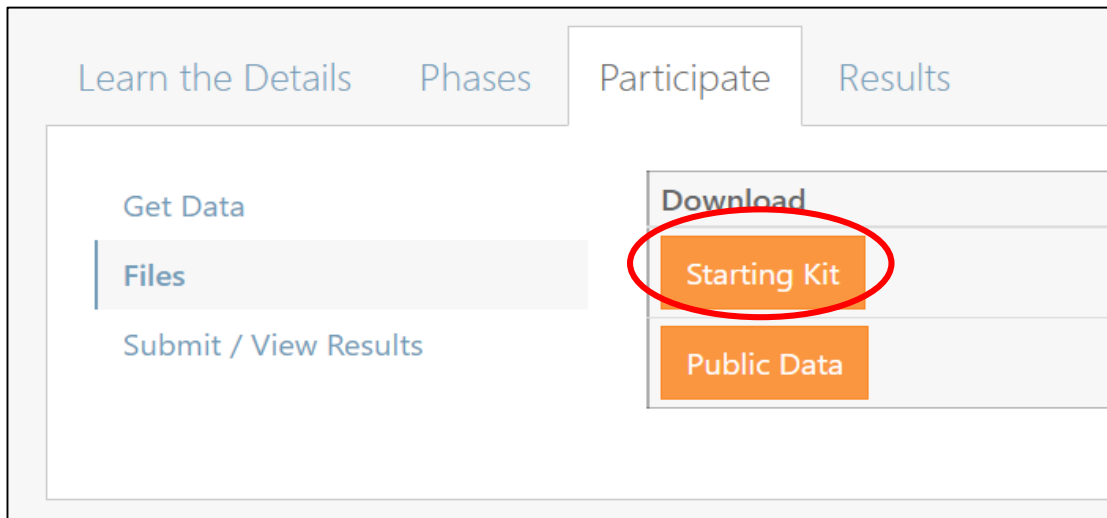
HW1 CodaLab competition: Create submission

- The submission file is a single .txt file compressed in zip
- The .txt file should be named as answer.txt

HW1 CodaLab competition: Submit results

- Upload your submission and see the performance on Results!
  - Participate -> Submit / View Results

HW1 CodaLab competition: Submit results

- If your submission format is correct, you should get the score in few minutes. Otherwise, see the scoring output/error log

Here are your submissions to date (✔ indicates submission on leaderboard):

#	SCORE	FILENAME	SUBMISSION DATE	STATUS	✔	
1	0.576327	sample_submission.zip	10/13/2021 01:32:26	Finished	✔	–

Description:

update description

Download your submission
View scoring output log
View scoring error log
Download output from scoring step

Remove from Leaderboard

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HW1 CodaLab competition: Leaderboard

● Do your best and beat the baseline!

Max submissions per day: 5

Max submissions total: 9999

Download CSV

		Results			
#	User	Entries	Date of Last Entry	Team Name	Accuracy ▲
1	ChenHsuanTai	1	10/07/21	baseline	0.65579 (1)

Grading policy: Model performance (70 points)

- Get at least 56 points (70x80%) by scoring over the baseline
- Your score will be interpolated with the model accuracy by the 1st rank and the baseline

Rank 1st = 1.00   model Acc = 0.96538

your score = 0.917   **your model Acc = 0.90**

Baseline score = 0.8   Baseline model Acc=0.561
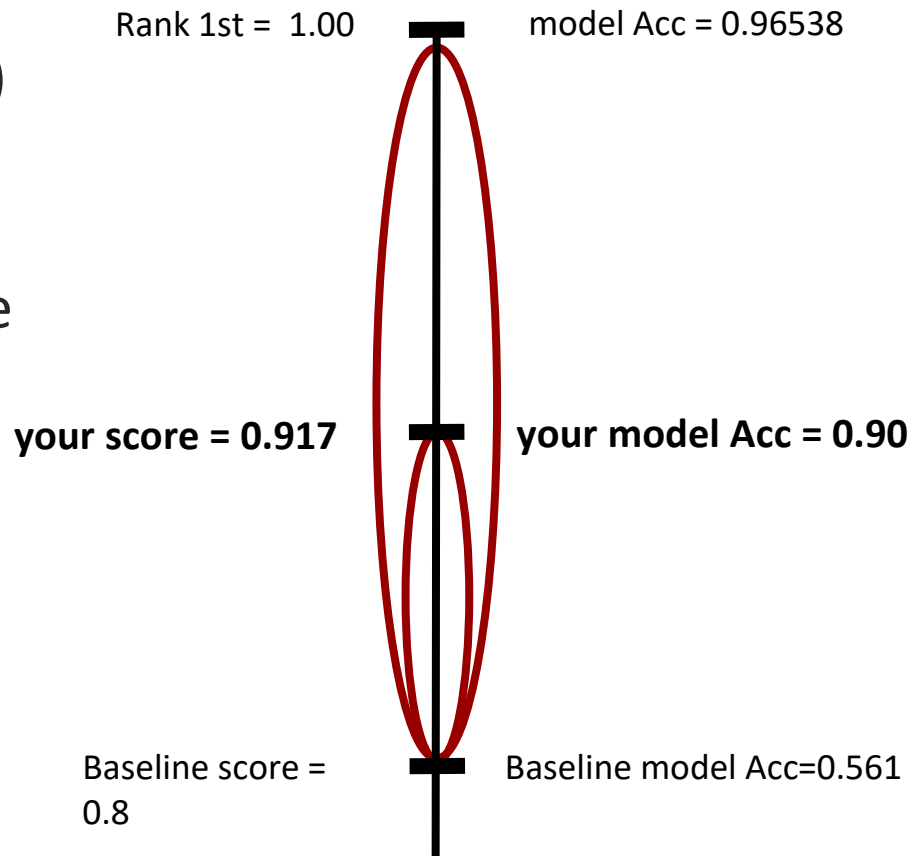
Grading policy: Reports (20 points)

- Document your work (**in PDF**)
  - ○ GitHub/ GitLab link of your code
  - ○ **reference if you used any code from GitHub**
  - ○ Brief introduction
  - ○ Methodology (Data pre-process, Model architecture, Hyperparameters,...)
  - ○ Summary
- **Meet requirements above can get 80% of the points (16 points)**

Reports bonus

- Thorough experimental results
- Comprehensive related work survey
- Interesting findings or summary
- Good example: **Kayo Yin**

Anti-aliasing

Most modern convolutional networks, such as ResNet18, are not shift-invariant. The network outputs can change drastically with small shifts or translations to the input. This is because the striding operation in the convolutional network ignores the Nyquist sampling theorem and aliases, which breaks shift equivariance.

I decided to apply an anti-aliasing method proposed in the recent April 2019 paper: "Making Convolutional Networks Shift-Invariant Again". This is done by simply adding a "BlurPool" layer, that is a blurring filter and a subsampling layer, after the convolution layers of

Code readability (10 points)

- Write beautiful Python code with <u>PEP8 guidelines</u> for readability
- Must provide a downloadable link of your model and a `inference.py` 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

Code readability bonus

- Clear structure and README of all your steps to reproduce the submission
- Good example: https://github.com/paperswithcode/releasing-research-code

The ML Code Completeness Checklist consists of five items:

1. Specification of dependencies
2. Training code
3. Evaluation code
4. Pre-trained models
5. README file including table of results accompanied by precise commands to run/produce those results

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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 HW1 but delay for two days, your will get only 90% - (20% x 2) = 50%!
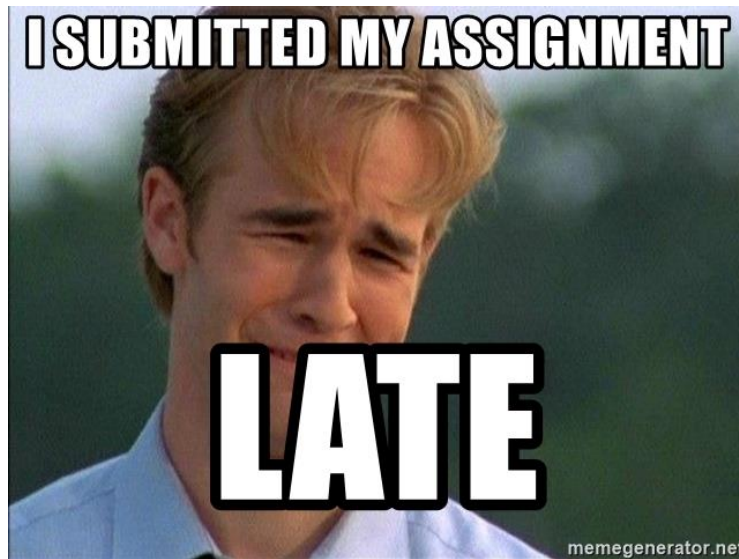
Keywords

- Beat the baseline
  - Data preprocess (normalization), Data augmentation, Proper hyperparameter setting (learning rate, optimizer)
- Rank Top 3!
  - Transfer learning, Modern CNN architecture, learning rate schedule, Model ensemble, Hyperparameter tuning, Hard negative mining, …
  - Google *fine-grained image classification*

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: applications, Pytorch: torchvision, TensorFlow: model zoo
  - **DO NOT copy code from your classmate!**
  - ○ Pre-trained model is usable for this homework
- How to deal with GPU Out-Of-Memory (OOM) errors?
  - ○ Lower your image size / batch size or use smaller network
- Which score will be used if I submit multiple predictions
  - ○ Only the highest one will be used to grade your homework

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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 or post it on E3 forum
  - Prof. Lin: lin@cs.nctu.edu.tw
  - TA Jimmy: d08922002@csie.ntu.edu.tw
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Have fun!