AI6126 Project 1
Fashion Attributes Classification Challenges

Project 1 Specification (Version 1.0. Last update on 10 February 2023)

Important Dates

Issued: 17 February 2023

Due: 24 March 2023 11:59 PM SGT

Group Policy

This is an individual project

Late Submission Policy

Late submissions will be penalized (each day at 5% up to 3 days)

Challenge Description

The goal of this mini challenge is to identify the attribute labels depicted in a fashion photograph. Our dataset has 6000 images, divided into 5000 images for training and 1000 for validation. The test set will be hosted online for final evaluation.

The dataset employs 26 attribute labels that are common descriptions of garments. These attributes are grouped into 6 major categories. Every image is annotated with 6 attributes, one from each category.

Your algorithm is required to predict which attributes a given image has. Therefore, this is a multi-label classification problem.

Table 1. The 26 Attributes and Their Categories

Category 1	Category 2	Category 3	Category 4	Category 5	Category 6
floral	long_sleeve	maxi_length	crew_neckline	denim	tight
graphic	short_sleeve	mini_length	v_neckline	chiffon	loose
striped	sleeveless	no_dress	square_neckline	cotton	conventional
embroidered			no_neckline	leather	
pleated				faux	
solid				knit	
lattice					

Figure 1. Example images for selected attributes (not all attributes are present in the current challenge)

Assessment Criteria

We will evaluate and rank the performance of your network model on our given **1000** test images based on the overall accuracy.

The higher the rank of your solution, the higher the score you will receive. In general, scores will be awarded based on the Table below.

Percentile in ranking	≤ 5%	≤ 15%	≤ 30%	≤ 50%	≤ 75%	≤ 100%	*
Scores	20	18	16	14	12	10	0

Notes:

- We will award bonus marks (up to 2 marks) if the solution is interesting or novel.
- Marks will be deducted if the submitted files are incomplete, e.g., important parts of your core codes are missing or you do not submit a short report.

Requirements

- Download the dataset from this link.
- Train your network using the provided training set, you are **only** allowed to use ImageNet-1K pretrained models.
- Tune the hyper-parameters using the provided validation set.
- While ImageNet pretrained models are allowed, **no** external data are permitted in this mini challenge. If the use of any external data (e.g., using the full DeepFashion dataset rather than the provided subset) is spotted, you will get a 0 mark for this project. We will have a rigorous check on using external data.
- You are **not** allowed to use images from the test set for training (e.g., pseudo-labeling).
- You should **not** use an ensemble of models.
- There are 6 attribute groups, each having a few attributes. There are 26 attributes in total. You may find the details in “list_attr_cloth.txt”. Your output file should contain, for each test image, the predicted attribute labels in every category. See the next section for an example.

Submission Guidelines

Submitting Results on CodaLab

We will host the challenge on CodaLab. You need to submit your results to CodaLab. Please follow the following guidelines to ensure your results are successfully recorded.

- The CodaLab competition link: https://codalab.lisn.upsaclay.fr/competitions/10635?secret_key=f607970e-691d-4c6a-adb5-a8059ca34df8
- Register a CodaLab account with your NTU email.
- After your registration, please fill in the username in the Google Form: https://forms.gle/XfQEqvtA49AgbauX6
- **Only after you fill in the Google Form will your application to the CodaLab be approved.**
- Submit a zip file containing a single file "prediction.txt" with 1000 rows of your prediction results on the test set. For example, the first five lines should be like:

  5 2 0 3 2 2

  5 2 1 3 2 2

  5 0 2 0 2 2

  5 0 2 0 5 2

  1 2 2 3 2 2

  … (1000 lines in total)

Note that your predictions should be in the exact same order of images as in test.txt. If you use PyTorch DataLoader, you should set "shuffle=False".

- You can submit your results multiple times but no more than 20 times per day. You should report your best score (based on the test set) in the final report.
- Please refer to the submission guidelines from this link. You can find more CodaLab submission format details there, as well as a submission sample.
- Please refer to Appendix A for the hands-on instructions for the submission procedures on CodaLab if needed.

Submitting Report on NTULearn

Submit the following files (all in a single **zip** file named with your matric number, e.g., **A12345678B.zip**) to NTULearn before the deadline:

- A short report in pdf format of not more than five A4 pages (single-column, single-line spacing, Arial 12 font, the page limit excludes the cover page and references) to describe your final solution. The report must include the following information:
    - the model you use
    - the loss functions
    - training curves (i.e., loss, accuracy for the val set)
    - the number of parameters of your model. Use "sum(p.numel() for p in model.parameters() if p.requires_grad)"
    - Specs of your training machine, e.g., number of GPUs, GPU model.

  You may also include other information, e.g., any data processing or operations that you have used to obtain your results in the report.
- The best results (i.e., the predicted labels) from your model on the 1000 test images.
- All necessary **code** you used in this project. You don't need to submit the training or validation images.
- **Screenshot on CodaLab of the score achieved**
- The **model checkpoint (weights)** of your submitted model.
- Please make sure the submitted checkpoint and code can re-produce the best results you submitted to Codalab. We will use them to check for plagiarism.
- A **Readme.txt** containing the following info:
    - Your matriculation number and your CodaLab username.
    - Description of the files you have submitted.
    - References to the third-party libraries you are using in your solution (leave blank if you are not using any of them).
    - Any details you want the person who tests your solution to know when he/she tests your solution, e.g., which **script to run**, so that we can check your results, if necessary.

Tips

- The following techniques may help you to boost the performance:
    - Data augmentation
    - Regularization
    - Deeper model (but be careful on overfitting, since we only have 5000 training images in this project)
    - Hyper-parameters fine-tuning, e.g., choice of the optimizer, learning rate, number of iterations
    - Think about what is unique to this dataset and propose novel modules.

Computational Resource

You can use the computational resources assigned by the MSAI course. Alternatively, you can use Amazon's EC2 or Google CoLab for computation. As a student, you can sign up to receive free $100 credit through the AWS Educate program. We encourage students to use *g2.2xlarge* instances running Ubuntu for maximal ease of installation. Note that $100 of Amazon credit allows you to run a *g2.2xlarge* GPU instance for approximately 6 days without interruption (you should keep it on only while using it).

References

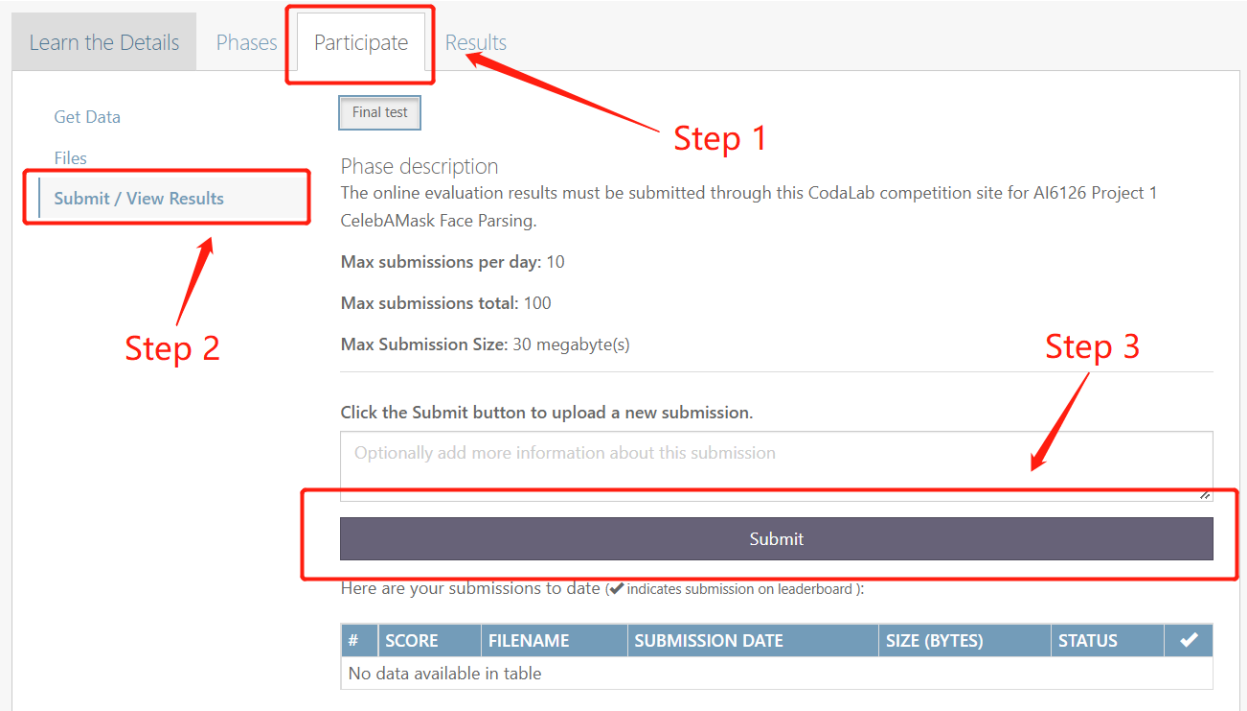
[1] He et al. Bag of Tricks for Image Classification with Convolutional Neural Networks, ArXiv 2018

[2] He et al. Deep Residual Learning for Image Recognition, CVPR 2016

[3] Lin et al., Focal Loss for Dense Object Detection, ICCV 2017

Appendix A Hands-on Instructions for Submission on CodaLab

After your participation to the competition is approved, you can submit your results here:



Then upload the zip file containing your results.

If the ‘STATUS’ turns to ‘Finished’, it means that you have successfully uploaded your result. Please note that this may take a few minutes.

Click the Submit button to upload a new submission.

Optionally add more information about this submission

Submit

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

#	SCORE	FILENAME	SUBMISSION DATE	SIZE (BYTES)	STATUS	✔	
1	[redacted]	[redacted]	[redacted]	[redacted]	Finished	✔	−

Description:

update description

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

Remove from Leaderboard