Assignment #3

Flower classification
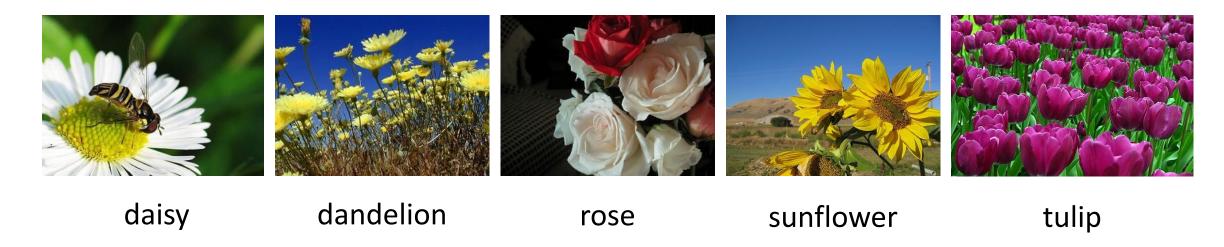
Due on Nov 16, 11:59 pm

Overview

- Image classification is a core and fundamental task in computer vision.

- In the assignment, you will implement a multi-class image classifier to recognize flowers.

- You will design and train a deep convolutional network from scratch to predict the class label of a flower image. This will help you gain experience with network design and get more familiar with PyTorch.

- Please note that you're not allowed to use a pre-trained model.

Flower Dataset

- The dataset is collected by Alexander Mamaev.
- It contains 4,317 images in 5 classes, with about 800 images per class.

| daisy | dandelion | rose | sunflower | tulip |

- The train/val/test splits are provided.
- Your model will be evaluated on the test set using the accuracy metric.

Your task

- We have code skeleton for you guys.
- https://colab.research.google.com/drive/1HabXPDoXGGG1buql2gk3ye_9uKfw6zCv

- Design a convolutional neural network to recognize the flowers. You must train your model from scratch.
- The images provided are of different resolutions. You'll need to resize the images into a fixed size of your own choice.
- To get a high accuracy, you'll need to experiment with different filter sizes, different number of layers, and other design principles discussed in class to figure out a network architecture that works best.
- You'll also need to try data augmentation, dropout, batch normalization as well as different optimizers and other tricks to boost performance.
- Again, you cannot use any pre-trained model in this part.

Things you cannot do

- You cannot submit results predicted by others.

- You cannot copy trained models from others.

- You cannot copy code from others, internet, GitHub …

- You cannot collect more images to train your model in order to boost performance.

- You cannot use the weights of pre-trained model.

Any violation will result in 0 scores!

Submission

- Submit your predictions on the test images to Kaggle for evaluation.

Kaggle Competition:

https://www.kaggle.com/c/mis583-2021-flower-classification/overview

- Submit your code + report to the CU.

- The report must include:
  - Your network architecture What you have experimented for performance improvements. This could include experiments that work and those that do not work.
  - Other findings if any

- Grading on report will mostly depend on the report quality. Please show your effort.

Grading

- 60% competition
  - Bonus points to top 3 teams
  - Top 3 teams will share their approaches in class

- 40% report