CS 4476: Computer Vision, Spring 2021
PS6

Instructor: Judy Hoffman

Due: Tuesday, April 27th, 11:58 pm ET

Instructions

1. The assignment must be done in Python3. No other programming languages are allowed.
2. Fill your answers in the answer sheet PPT provided and submit the file under the name: First-Name_LastName_PS6.pdf on Gradescope. Please **do not modify the layout** of the boxes provided in the answer sheet and fit your answers within the space provided. You will be penalized for changing the template.
3. Please enter your code in the designated areas of the template Python files. Please do not add additional functions/imports to the files. Points will be deducted for any changes to code/file names, use of static paths and anything else that needs manual intervention to fix.
4. Please submit your code and output files in a zipped format, using the helper script `zip_submission.py` with your GT username as a command line argument (using `--gt_username`), to Gradescope. Please do not create subdirectories within the main directory. The `.zip_dir_list.yml` file contains the required deliverable files, and `zip_submission.py` will fail if all the deliverables are not present in the root directory. Feel free to comment and uncomment them as you complete your solutions.
5. For the implementation questions, make sure your code is bug-free and works out of the box. Please be sure to submit all main and helper functions. Be sure to not include absolute paths. Points will be deducted if your code does not run out of the box.
6. If plots are required, you must include them in your Gradescope report and your code must display them when run. Points will be deducted for not following this protocol.
7. Ensure that you follow the instructions very carefully.

Setup

Note that we will be using a new conda environment for this project! If you run into import module errors, try `pip install -e .` again, and if that still doesn't work, you may have to create a fresh environment.

1. Download and extract the data from the link data.zip. Place the data folder at the root of the project folder.
2. Install Miniconda. It doesn't matter whether you use Python 2 or 3 because we will create our own environment that uses 3 anyways.
3. Open the terminal

(a) On Windows: open the installed **Conda prompt** to run the command.
(b) On MacOS: open a terminal window to run the command
(c) On Linux: open a terminal window to run the command

4. Navigate to the folder where you have the project
5. Create the conda environment for this project.
   (a) On Windows: `conda env create -f proj6_env_win.yml`
   (b) On MacOS: `conda env create -f proj6_env_mac.yml`
   (c) On Linux: `conda env create -f proj6_env_linux.yml`
6. Activate the newly created environment
   (a) On Windows: use the command `conda activate proj6`
   (b) On MacOS: use the command `source activate proj6`
   (c) On Linux: use the command `source activate proj6`
7. Install the project files as a module in this conda environment using `pip install -e .` (Do not forget the `.`).
8. If you run into issues with Pytorch on Windows, please check if you have the 64 bit version installed.

Run the notebook using `jupyter notebook ./proj6_code/proj6.ipynb`.

At this point, you should see the jupyter notebook in your web browser. Follow all the instructions in the notebook for both the code + report portions of this project.

Submission Instructions

Recheck you pass all local unit tests by staying in the root directory and running the command `pytest proj6_code/proj6_unit_tests`. This command will run all the unit tests once more, and you need to add a screenshot to the report. Ensure that the conda environment `proj6` is being used.

- Submit the code as zip on Gradescope at PS6 - Code.
- Submit the report as PDF on Gradescope at PS6 - Report.

There is no submission to be done on Canvas.

Rubric

This problem set has 100 points of mandatory credits and 20 extra credits.

Code: The score for each part is provided below. Please refer to the submission results on Gradescope for a detailed breakdown.

Part 1: Dataset	10
Part 2: Model Architecture and Forward Pass	45
Part 3: Loss function	10
Part 4: Optimization	10
Part 5: Training SimpleNet	10
EC 1.1: Data Augmentation	3
EC 1.2: SimpleNetDropout	3
EC 2: MyAlexNet	6
Total	*85 (+12)*

Report: The report is worth 20 points. Please refer to the pptx template where we have detailed the points associated with each question.

Part 1: Dataset	4
Part 3: Loss function	4
Part 5: Training SimpleNet	5
Conclusion	2
EC 1: Overfitting	4
EC 2: MyAlexNet	4
Total	*15 (+8)*

Deliverables

The code deliverable will be uploaded as a zip file on Gradescope.

Do not create this zip manually. You are supposed to use the command `python zip_submission.py -gt_username <username>` for this.

The second thing to upload is the PDF export of the report on gradescope.

This iteration of the assignment is developed by Ayush Baid and Judy Hoffman.

This assignment was developed and maintained by Ayush Baid, Cusuh Ham, Jonathan Balloch, Haoxin Ma, Jing Wu, Shenhao Jiang, Frank Dellaert, and James Hays.