Assignment 2

General

This work is based on Michigan University EECS 498-007 Deep Learning for Computer Vision, Assignment 4 (full credit below).

It will enable you to easily build complex models without worrying about writing code for the backward pass by hand.

The goals of this assignment are:

- Use image gradients to synthesize saliency maps, adversarial examples, and perform class visualizations
- Combine content and style losses to perform artistic style transfer

This assignment is due on **Sunday, January 10**.

Part 1: Network Visualization (50 points)

The notebook **network_visualization.ipynb** will walk you through the use of image gradients for generating saliency maps, adversarial examples, and class visualizations.

Part 2: Style Transfer (50 points)

In the notebook **style_transfer.ipynb**, you will learn how to create images with the artistic style of one image and the content of another image.

Steps

1. Download the zipped assignment file

- Click here to download the starter code

2. Unzip all and open the Colab file from the Drive

Once you unzip the downloaded content, please upload the folder to your Google Drive. Then, open each `*.ipynb` notebook file with Google Colab by right-clicking the *.ipynb file. We recommend editing your `*.py` file on Google Colab, set the ipython notebook and the code side by side. For more information on using Colab, please see our Colab tutorial.

3. Work on the assignment

Work through the notebook, executing cells and writing code in `*.py,` as indicated. You can save your work, both `*.ipynb` and `*.py,` in Google Drive (click "File" -> "Save") and resume later if you don't want to complete it all at once.

While working on the assignment, keep the following in mind:

- The notebook and the python file have clearly marked blocks where you are expected to write code. **Do not write or modify any code outside of these blocks**.
- **Do not add or delete cells from the notebook**. You may add new cells to perform scratch computations, but you should delete them before submitting your work.
- **Run all cells, and do not clear out the outputs, before submitting.** You will only get credit for code that has been run.
- **Cells for submission to Umich autograder should not be run.**

4. Evaluate your implementation

Once you want to evaluate your implementation, please submit the `*.py`, `*.ipynb` and other required files to Moodle, for grading your implementations \ after implementing everything.

5. Download .zip file

Once you have completed a notebook, download the completed file, which is generated from your last cell of the `style_transfer.ipynb` file. Before executing the last cell in `style_transfer.ipynb`, please manually **run all the cells of notebook and save your results** so that the zip file includes all updates.

Make sure your downloaded zip file includes your most up-to-date edits; the zip file should include:

- *network_visualization.ipynb*
- *style_transfer.ipynb*
- *network_visualization.py*
- *style_transfer.py*
- *saliency_maps_results.jpg*
- *adversarial_attacks_results.jpg*
- *class_viz_result.jpg*
- *style_transfer_result.jpg*
- *feature_inversion_result.jpg*

6. Submit your python and ipython notebook files to Moodle

When you are done, please upload your work to Moodle. Your `*.ipynb` files *SHOULD include* all the outputs. Please check your outputs up to date before submitting yours to Moodle.

Source for this work:

EECS 498-007 / 598-005: Deep Learning for Computer Vision

- Prof. Justin Johnson

  Website for UMich EECS course