SCS Fall - 2020

Assignment 4 - Generative Models

Re-submit Assignment

Due Dec 8 by 6pm	**Points** 15	**Submitting** a text entry box, a website url, or a file upload

In this assignment, you are generating sample images of Simpsons with deep convolutional generative adversarial networks (DCGANs).

You need to do the following:

1- Read and understand this tutorial (**Note:** use Keras code instead): https://towardsdatascience.com/image-generator-drawing-cartoons-with-generative-adversarial-networks-45e814ca9b6b ⧉

2- Download the dataset and the source code (Jupyter Notebook) given in the tutorial. Analyze and understand the code. (Note: you need to work on images in the "cropped" folder in the dataset)

3- The code is implemented using Tensorflow. **You need to change it to fully uses Keras**. Please keep the structure of the code (name of the functions and so on) so it is easier to follow your code.

4- Change the code to use resized images. **The original images are 128x128 but you need to resize them to 64x64 before training**. **You need to make the required adjustments in the network to accommodate this change.** This will make training faster too.

5- Make sure you keep all the plotting parts of the code so you can observe how the system learns in each epoch.

6- If training on Colab will be slow, you can only run it for 50 epochs (or as many as possible). To test your code, you can run first one or two epochs. Once everything is working, then you can let it run for 50 or 300 epochs.

7- If you wanted to run it faster, you can get free trials of GPU instances on AWS or Google cloud.

8- Submit the notebook with all the results included in the notebook.

All programs should be commented in such a manner as to clearly describe the purpose of the code used to accomplish the purpose. Also, make sure to provide a brief and clear interpretations of the results.

General best practices for assignments:

- Program factored into appropriate functions

- Functions have appropriate length and complexity

- Clear function, parameter, and variable names used

- Program is easy to read and understand (i.e. proper documentation)

Proper documentation

Comments must provide the understanding of a program by briefly pointing out details or by providing a larger-scale view of the proceedings.
Please see below some considerations for better documentation of your assignments:
- Documentation and comments that describe the *purpose* of the code and *why* it does thing. Example: include a sentence describing the purpose and contextualizing (give preconditions and postconditions of each function) the purpose of the program unit in simple language.
- Consistent indentation and formatting of code blocks to make the structure of the code visible
- Interpretation of the results in simple language and implications if any.

Assignment 4 - Rubrics			
Criteria	**Ratings**		**Pts**
Data Preprocessing	3.0 pts Full Marks	0.0 pts No Marks	3.0 pts
Building Generator, Discriminator networks, and loss function	6.0 pts Full Marks	0.0 pts No Marks	6.0 pts
Training process and results	4.0 pts Full Marks	0.0 pts No Marks	4.0 pts
Documentation All programs should be commented in such a manner as to clearly and briefly describe the purpose of the code used to accomplish the purpose as well as a brief and clear interpretations of the results.	2.0 pts Full Marks	0.0 pts No Marks	2.0 pts
		Total Points: 15.0	