**LAB #8**

**Image to Image (Stable Diffusion)**

(10 pts)

**Due by Oct 18th Wed 4pm**

Stable Diffusion is a generative AI tool that lets you create or edit various different types of images. There are text to image and image to image methods.

This lab provides hands-on experience using Stable Diffusion and explores the concept and hands-on practices of image to image.

For this and other Stable Diffusion labs, we need to have Python to 3.10 version and install a few extensions (eg. Controlnet and Roop).

**[Setting up for Stable Diffusion]**

The following steps in paperspace.com site will upgrade Python to 3.10 version, install the extensions and UI:

1. Log into Paperspace.com
2. Goto notebooks
3. Select a free GPU & 6hr (or less)
4. Turn on the ‘Advanced options’.
5. Enter the following in ‘Container Name’: **cyberes/gradient-base-py3.10:latest**This will assure Python 3.10 version
6. Click ‘Start Notebook’
7. Upload the ‘StableDiffusionUI\_automatic1111.ipynb
8. **Run the cells one at a time.** **This will take some time (15mins or so)** Have patience!
9. Under the module named ‘Launch the WebUI,’ you will find a URL such as http://37uw51098weoiruwieur92skjfd984lsj.**gradio.live (see the image next page)**
10. Now you are in Stable Diffusion Web UI (an excellent tool for text2img and img2img)
11. You may background the screen by adding the following code **/?\_\_theme=dark** in the web browser address.
12. On the top menu, click ‘Extensions,’ we will use **controlNet** and **Roop** extensions.
13. Click the ‘Available’ stub to find **controlnet** and **roop** extensions from the list (use the search filter on your web browser)
14. Find **controlNet** and **roop** and click it to install (do one install at a time)
15. In the extensions tab go to the ‘installed’ tab and then click on the "Apply and quit" button. You then close the window and run the cell to open the GUI again
16. When both extensions are installed completely, goto the top of the screen and click ‘txt2img’ stub to go back to main UI page
17. Again, under the module named ‘Launch the WebUI’ (see enclosed screen capture) you will find a URL such as http://37uw51098weoiruwieur92skjfd984lsj.**gradio.live**

A screenshot of a computer

Description automatically generated

1. Back to the ‘img2img’ main UI page
2. You may background the screen by adding the following code (/?\_\_theme=dark) in the web browser address.
3. Now you are ready to **start the image to image lab**.
4. In this lab, we’ll focus on the **controlNet** module.
5. You will need an image to start the lab.You may load any image (your own picture) in the img2img box. Alternatively, you may do a txt2img and choose send to img2img
6. For the lab instruction step by step, there are many Youtube tutorial videos. We will use this particular video for the lab.   
     
   *“Stable Diffusion IMG2IMG: EVERYTHING you need to know IN ONE PLACE!”* <https://www.youtube.com/watch?v=inW3l-DpA7U>
7. Watch the entire video and take notes for the “how-to” steps. You are to execute the mentioned features (inpaint, denoiser reduction, masked, etc…) in your work.
8. You and your partner are to do **four images in different genre/categories** (eg. animal, nature, physical objects, your own self picture/image, etc….)
9. For the Canvas submission, do a MS Word table and capture both original and new images with descriptions/narration of what functions and their values used and how you completed. The clarity of your description should illustrate the entire your work process.