Artificially Made or Not?

New mexico

Supercomputing Challenge

Final Report

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Team 15

V sue Cleveland High

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What is A.I. Generated Art?

An A.I art generator is an artificial intelligence that analyzes thousands of images from the web and with human assistance, creates art. First developed by Harold Cohen in 1973, Ai art has created a stir in the art industry as it has recently grown in popularity. With art generators being accessible with just an online search the average person can make their own art by just typing a short description of what they want the art to look like. This could be good for the average person who wants a specific painting or drawing and doesn't want to pay for it, but what happens to artists?

Problem Statement

In recent years with A.I art becoming so popular you can find it anywhere on social media, search engines, and maybe even someone's wall. But how do you know if it's artificially made or not? I wanted to see if I could make an image classifier to separate A.I. art from human made art; specifically Dall-e

Why this matters…

One of the biggest concerns of artists is that art generators will replace human artists in work. A man named Jason M.Allen won the digital art category in the Colorado 2022 State fair fine art show. He won the first place prize of $300 with art that was created using Midjourney, a popular A.I. art generator. "Mr. Allen's work, "Théâtre D'opéra Spatial," took home the blue ribbon in the fair's contest for emerging digital artists — making it one of the first A.I.-generated pieces to win such a prize, and setting off a fierce backlash from artists who accused him of, essentially, cheating." (Kevin Roose) besides first place prizes A.I. Art can also win you angry artists. Since AI art generators use art from the internet, many artists argue their work is being stolen. "Sarah Andersen, Kelly McKernan, and Karla Ortiz—has filed a class-action lawsuit against the AI giants behind these tools, claiming that they have violated the copyrights of millions of artists by using their work to train image generators." (Camille Sojit Pejcha) A.I. art generators use art from the web to create art of their own. This has become an issue because a specific piece you asked for can look all too much like an

already existing piece of art. To make matters worse you can even ask an art generator to make art in the style of any artist as long as they are popular enough.

Look at the images below and try to guess which was made by humans or by A.I.

If you guessed the painting of the houses on the top right were A.I. made then you were wrong. The painting of the lady on the top left was made with Dall-e. If you guessed the room of paintings on the bottom left was A.I. made then you were wrong. The painting of the dragon was A.I. generated. Did you guess any right? If so, was it pure luck or could you tell the difference?

What I did for my project…

In the beginning of the project I was very lost because I didn't know anything about deep learning or building virtual environments. First I scoured YouTube for answers on how to get started. Then I found videos on how to build an image classifier, and how to get started with deep learning. I collected hundreds of images to be used to train the deep image classifier. I set up a Python and Jupyter Notebook with Anaconda. Then For deep learning I installed tensorflow and started coding. I stumbled across an issue with my GPU. At first I thought I installed the wrong version of tensorflow or mistyped my code. I went back through the videos and my code to see if I did something wrong. I even tried using google to help me find the answer to why I couldn't enable my GPU. I got sources for my GPU issue from the judges after my interim report which I am thankful for but still couldn't get it to work. I am still stuck on the same problem now.

```
[5]: gpus = tf.config.experimental.list_physical_devices('GPU')
     for gpu in gpus:
         tf.config.experimental.set_memory_growth(gpu, True)
```

```
[6]: tf.config.list_physical_devices('GPU')
```
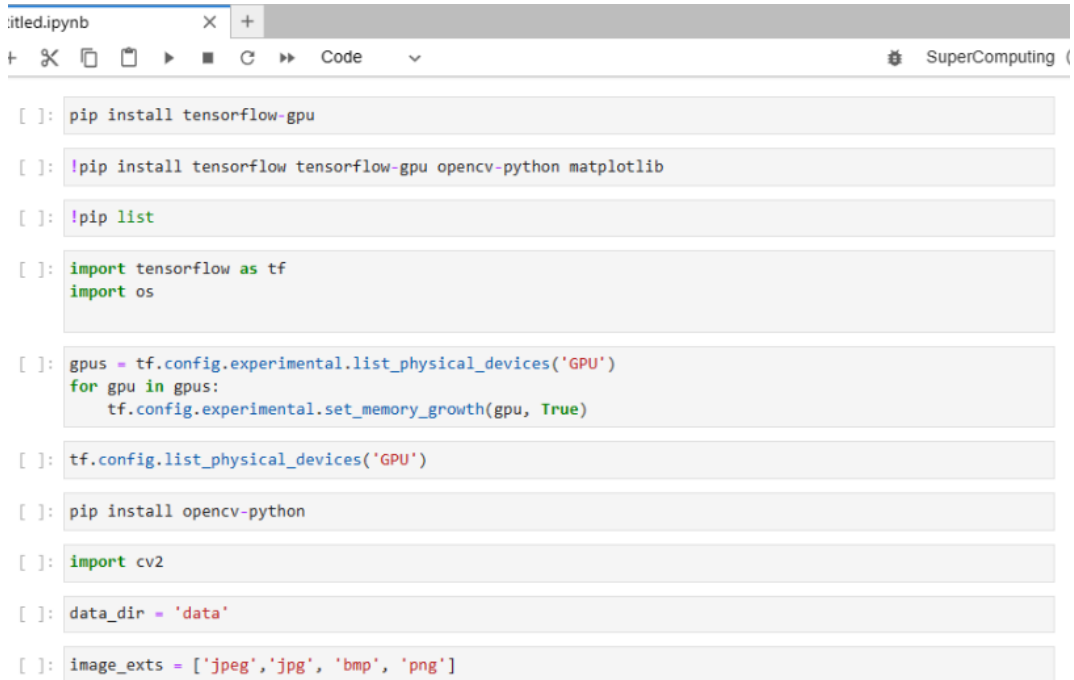
```
[6]: []
```

The Experience

Even though I wasn't able to finish the project I did get to learn a lot from this experience. Through this project I learned how to better navigate my PC and how to use Command Prompt. I can better understand the coding language Python and the many uses it has to offer. I learned how to set up environments and how to activate them. I learned how to use the Jupyter Notebook and the JupyterLab. I had fun making this project even if I didn't get to finish it because I got to learn a lot about programming and A.I generated art. It was fun to see a line of code work after many failed attempts and to learn about A.I. Art generators and other generators like them and how they affect our modern lives.

My Most Significant Achievement

My most significant achievement was to be able to understand and get the first part of the code to work. With my very little experience in how deep learning works I was happy to see that at least some of my code was working and giving me the results I wanted. Even if I couldn't finish the project.

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[ ]: pip install tensorflow-gpu

[ ]: !pip install tensorflow tensorflow-gpu opencv-python matplotlib

[ ]: !pip list

[ ]: import tensorflow as tf
     import os

[ ]: gpus = tf.config.experimental.list_physical_devices('GPU')
     for gpu in gpus:
         tf.config.experimental.set_memory_growth(gpu, True)

[ ]: tf.config.list_physical_devices('GPU')

[ ]: pip install opencv-python

[ ]: import cv2

[ ]: data_dir = 'data'

[ ]: image_exts = ['jpeg','jpg', 'bmp', 'png']
```

Future Plans

A YouTube channel called Corridor released a video in Fed 26 2023 called

"ANIME ROCK, PAPER, SCISSORS" where the Corridor team created a short

anime style video with stable diffusion and videos of themselves acting. Though

not perfect because of the flickering in the characters, it's still amazing how far

A.I. generation has come and I believe in the future that making videos like the

Corridor team did will improve. I think animation created using A.I. will have an

impact on the world because there won't be a big need for human animators.

This could be a good and bad thing because now a small group of people can

make videos and short films from home without the long pain of animating but it

could also take away jobs of thousands of animators and character designers. In

the future if I were to expand this project I would like to work on differentiating human made animation and A.I. generated animation.

Acknowledgments

Thank you Miss Knoell for believing and supporting me. Thank you judges Richard Barrett, Krishna Kalyanam, and Maximo Lazo for giving me advice. Thank you Dr. Daniel R. Fuka for seeing promise in my project and providing advice.

Dataset
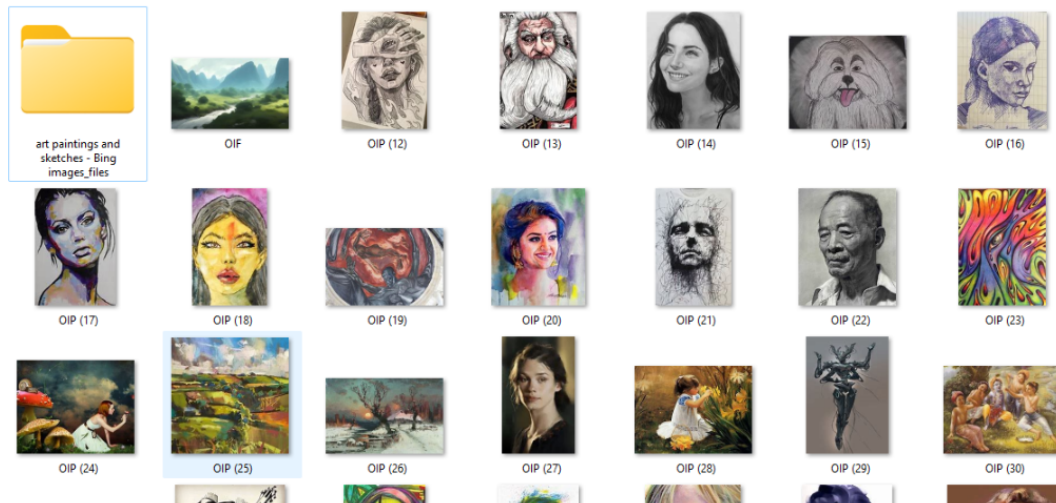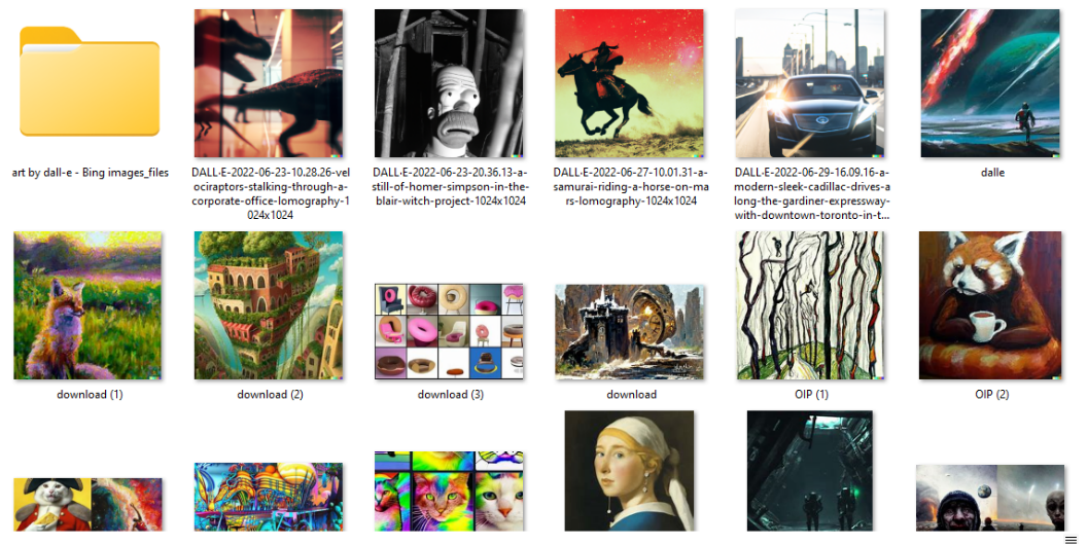
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