Mentor Assessment #2

Mentor: Kyle Icban

Profession: Frontend Software Engineer

Date/Time: November 8th, 2024, 12:15 p.m. - 1:00 p.m.

Assessment:

My meeting with Mr. Icban started with a discussion about my ongoing research and what I had built the past week. I have been learning about how to build a model differentiating between images generated by AI and images created by a human artist; with the guidance of my secondary research, I built a simple model differentiating AI-generated images from human-generated images. This model was different from my other projects in that it built off of a pre-built network, ResNet50 – and when showing Mr. Icban my model, he mentioned how this was a standard practice for machine learning engineers. Just as software engineers build off of frameworks to streamline a project, machine learning engineers will typically tailor pre-made networks like ResNet50 to their intended purpose.

Since I still had to fully test and refine the model, this was the extent of my discussion with Mr. Icban regarding what I'd built. I entered this meeting primarily curious about how I could tie what I had built into the overall architecture of my project. Therefore, this is what we spent the rest of our time discussing.

As I researched more about how to use machine learning to detect the similarities between two images, I happened across a few different structures to implement this. One of the most popular implementations I came across was the siamese network: a neural network system involving two identical convolutional neural networks (CNNs) taking in the same input and output different results for comparison. Another implementation I came across was the triplet

loss network: in this network system, three identical CNNs process and compare a base image, an image similar to the base image, and an image different from the base image. Seeing these implementations, I was left with one question: "What are the benefits and drawbacks of using these implementations?"

Mr. Icban said I could expand on this question through more secondary research, but that the siamese neural network route was certainly a viable one. He also noted that there might be a package to create this structure, which is something I had not previously considered and plan on further researching following my meeting. Hearing Mr. Icban's solution, I am also now curious about what pre-built packages are available to create more complex neural networks — while I have researched how to build a neural network from scratch, I have not looked at how to build anything more intricate. Now that I had built a model of my own and developed a fundamental understanding of how CNNs worked with image detection, Mr. Icban and I spoke about the next big challenge for my Original Work: acquiring the data for my model.

We touched on web scraping, specifically for acquiring image data from sites like Depop and Redbubble (where I plan on ultimately running my image detection model). From my prior research, I have had some experience with basic web scraping by using BeautifulSoup to acquire table data from Wikipedia. Knowing this, Mr. Icban advised that I try using BeautifulSoup once again to send a request to the HTML of each website's search URL, parse the HTML to extract images, and then clean up the data of each image afterward. He noted that for the purpose of my project, this would also mean needing to build my own dataset from scratch — this is something I plan on looking into this week as I continue my research.

My meeting with Mr. Icban was incredibly valuable in shaping the next steps for my project. His insights on using pre-built models, such as ResNet50, helped me better understand

industry-standard practices for machine learning, and his advice on web scraping techniques for data collection has given me practical tools and strategies to gather and prepare the data essential for my Original Work's model. I now feel more equipped to advance my project with a clear roadmap, from refining my model to acquiring quality data efficiently.