Final Reflection

My initial vision for this project has not changed too drastically since the start of its creation. For my final project, I originally planned to simply combine what we learned about machine learning with API calls. At the time of the project proposal, I had not yet fully committed to one idea, so I envisioned that the final product would either take in a picture of food, predict what cuisine it is, and recommend a restaurant that serves that kind of food; or take in user preferences (i.e. favorite dishes, budget, location, etc.) to recommend a restaurant they would most likely enjoy. Overtime, this vision slowly evolved, as I found a great dataset that would allow me to take in pictures of food and predict what kind of food it was, rather than its cuisine. This same vision stayed for the remainder of the project, as it has now come to an end and my project uses machine learning to predict what kind of food is in a picture, then uses API calls to recommend the top 10 restaurants that serve that dish.

It is now the end of the semester, and my final project is finally complete. The finished product does exactly what I had hoped. Using a Flask app, users can click a button to upload a picture of food, which is then passed to the backend where the trained model predicts what kind of food is in the picture. The backend then makes a call to the Yelp API to get a list of the top ten restaurants in Los Angeles that serve that specific dish. This data is then passed back to the front end and displayed to the user.

This final system took a lot of trial-and-error, tutorials, and patience (especially patience) to complete. Since we had done many simple API calls and machine learning algorithms in our homeworks, making test API calls and creating and applying the machine learning model were both relatively easy steps. The difficulty arose when trying

to combine the two into one application that streamlined the process. However, over the course of this project, I learned more about how to create working Flask apps, learned even more about html and CSS, and gained a better understanding of machine learning done on images. I sat with my computer for 90 hours as it ran the training algorithm for the final model, and learned what a HDF5 file is and how to use it. Overall, I'd say I learned quite a bit about all the technologies I used.

Given the time, I would do something even closer to my original idea by adding the possibility for even more user input on the Flask front end. For example, I would allow users to put in preferences on rating, price range, and possibly even the ability to use the user's current location in order to return an even better, more accurate list of recommendations. I would also fix up the Flask app and add more CSS code to make it look nicer.

In retrospect, there are probably a few things I would have done differently, given the chance to redo this project. Most importantly, I would change the way I handled the model training phase. I decided to dive in head first and immediately train the model using a dataset of over 100,000 pictures. This resulted in my computer running for 4 days straight and being essentially unusable during that time. Given the opportunity, I would start out using a small subset of the dataset to train the model and slowly increase the number of training images used, rather than immediately going for the entire thing. Since completing the project, I have also seen people use Google Colab, which seems to be better for running machine learning training epochs. If I had the chance to do this project again, I would use Google Colab because it would make the training process much easier.