

CS 344

Tomoki Takeuchi

Dr. Kenneth Arnold

April 28, 2022

Non-Technical Report

Image classification has been a popular field of AI applications. For example, an image classification model can tell if the picture given is whether a dog or a cat. In CS 344, the main library we used to do the task was Fast.ai, which is a deep learning tool. In the class, we also used Transformers. It is a library that are often used for natural language processing, such as text summarization and sentiment analysis. However, recently, they extend the application of Transformers to image classification task as well.

During the conversation with the course instructor, he mentioned that he is planning to use Transformers for image classification eventually, which gave me the idea for my final project. In the final project, I redid one of the homework where we used Fast.ai library to implement image classification, but this time, I used Transformers instead. After creating the model, I compared the model's accuracy and implementation easiness.

Transformers Model	Fast.ai Model
seed = 1: eval_accuracy = 1.0	seed = 1: accuracy = 0.8235
seed = 10: eval_accuracy = 1.0	seed = 10: accuracy = 0.7353
seed = 100: eval_accuracy = 1.0	seed = 100: accuracy = 0.7647
seed = 1000: eval_accuracy = 0.8824	seed = 1000: accuracy = 0.9412

The pictures above are the results. I tested 4 times, and in each test, I calculated accuracy. Accuracy measures the percentage of the right answers out of the total cases. As the pictures show, Transformers model has much better accuracy than the Fast.ai model. The range of accuracy for Transformers is 0.88 to 1.0, which is 0.74 to 0.94. It is also impressive that the Transformers model had accuracy of 1.0 three times. However, one thing that I noticed was that it takes a lot more coding to implement Transformers model compared to Fast.ai model. In Fast.ai, there are functions that do all the tedious setting for you while Transformers do not.