# Journal Report 13

1/13/20-1/17/20
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## Daily Log

### Monday January 13

Tried to use pickle.dump to save model on zoidberg, but got error "TypeError: can't pickle _thread._local objects". Found that it is not good practice to pickle a model and decided to use model.save() instead.

### Tuesday January 14

Using model.save(), I got an error that appeared to be part of a convolution layer not being able to save correctly because it is a resource variable and needed to be either a tensor or a string. I tried to use other methods of saving in tensorflow, but each came up with a different error. For example, using save_model() created an error involving Eager execution, which I needed to disable in order to print the confusion matrix. By commenting out the confusion matrix, I was able to save the model without throwing an error, but this is not ideal. When I tried to only save weights I got an error saying "NoneType has no attribute 'update'".

### Thursday January 16

I created a short python script to preprocess the test set data and load the model previously saved using tf.keras.models.save_model(). After loading the model and evaluating it on the test set, I saw that I was able to successfully retrieve the model I had trained last class.

## Timeline

| Date | Goal | Met |
|---|---|---|
| December 9-13 | Successfully overfit model on small dataset of 50 images | Yes, with Batch Normalization Layer, model no longer only predicted author 0 |
| December 16-January 10 | Train a model that can predict author identity with at least 0.7 accuracy on the test set | Yes, after implementing Batch Normalization to my previous model, I got an accuracy of 0.87 on the test set after 20 epochs. |
| January 13-17 | Successfully save model after training on zoidberg | Yes, saved and loaded model, but cannot save and display confusion matrix in the same run due to conflicts with EagerExecution. |
| January 20-24 | Add more layers and increase filters in current convolutional layers. Observe effect on accuracy and implement in model accordingly. | |
| January 27-31 | Research methods for distinguishing lines from a written page. | |

## Reflection

This week, I worked on saving my model after training on zoidberg. My previous approach was to just pickle the model, which worked on my computer but threw an error on zoidberg because of the way tensorflow-gpu handles models. After looking at other methods of saving models, I kept running into issues. Using model.save() threw an error involving the convolution layer not being the same variable type it expected. I tried to save only the weights to avoid these issues I was getting by trying to save the model architecture, but I got an error while saving when save_weights tried to call the update method. I realized my best bet was to use tf.keras.models.save_model as the only error there was a result of disabling eager execution, which I needed to do in order for the confusion matrix to work. I tried re-enabling eager execution after printing the convolution matrix, but that did not work, so I ended up having to comment out the confusion matrix in order to successfully save the model. This is not ideal, but I can still see the confusion matrix after loading the model, so it is not as much of an issue as it could have been.