Summer 2021: CSEE5590 – Special Topics

Python_Lesson_5_Part_1: Basics in Keras

Lesson Overview:
In this lesson, we are going to discuss Neural Network, Backpropagation, Activation Function, Linear Regression, Cost/Loss Functions, Gradient Descent (Optimization Algorithm) and Learning Rate.

Use Case Description:
Image Classification on the hand written digits data set

Source Code:
Provided in your assignment folder and assignment repo.

In class programming:

1. We had used 2 hidden layers and *relu* activation:
    a. Change the number of hidden layers and the activation to tanh or sigmoid and report what happens.
2. Using the history object in the source code, plot the loss and accuracy for both training data and validation data.
3. Plot one of the images in the test data, and then do inferencing to check what is the prediction of the model on that single image in the test data.
4. Convert the sequential model to API model.
5. Run the same code without scaling the images, how the accuracy changes?

Online Submission Guidelines (for Online students):
1. Submit your source code and documentation to GitHub and represent the work in a ReadMe file properly (submit your screenshots as well. The screenshot should have both the code and the output)
2. Comment your code appropriately
3. Video Submission (2 – 5 min video showing the demo of the assignment, with brief voice over on the code explanation)

Note: *Cheating, plagiarism, disruptive behavior and other forms of unacceptable conduct are subject to strong sanctions in accordance with university policy. See detailed description of university policy at the following URL: https://catalog.umkc.edu/special-notices/academic-honesty/*