**CS 4710-5710**

**Artificial Intelligence**

**Final Exam (200 pts.)**

**Date:** 5-2-2020

**Due:** 5-8-2020 by 5 pm

**Given:** MNIST Sample Data Set

**1. Find: (100 pts.)**

**a)** Utilizing GANs source code from last lecture generate a sample of the MNIST data set after 5000, 10,000, 50,000 and 100,000 epochs. **b)** Discuss the importance of GANs in synthetic data generation **c)** Discuss how a GANs neural network is able to generate data that is very similar to the original data. Be very detailed in your discussion. **d)** Discuss how you might apply this type of neural network to a system with a very small amount of data. **e)** Why don’t the images from part **(a)** not look like each other?

**2. Find: (100 pts.)**

**a)** From the sequential training data provided train your RNN-LSTM. Then run your test data to see if you achieved good predictive capability with your model. **b)** Show a graph of the actual test data against your predicted values. **c)** Discuss why you may not have been able to achieve the accuracy you hoped to achieve with this RNN-LSTM model. **d)** What factors are very important for an RNN-LSTM neural network in order to achieve good agreement between actual and predicted values in sequential data.