

**STT 811**

**Homework 8**

**Due April 28, at 11:59:59 pm**

1. For the star dataset,
  - a. Create a 70/30 train test split.
  - b. Create a neural network model for type, using u, g, z, and Redshift. Use a single hidden layer with 3 nodes and tanh activation functions. Compute the confusion matrix for the train dataset.
  - c. Re-create the model predictions in (b) with algebraic operations.
  - d. Create an xgboost model using the Texas 2-step. Use the outputs of the hidden layer from (c) as inputs to an xgboost model to create predictions for Class. Compare the results to what we get in (b).
2. ISLR2 10.7. Compare the results from using different dropout regularization rates.
3. Use the code in ISLR1 Section 10.9.3 to create a CNN for the CIFAR data. Compare the accuracy results to 4 or 5 modifications of your choice, such as:
  - a. Changing max pooling to average pooling
  - b. Change to pooling size
  - c. Varying the dropout rate
  - d. Changing the activation function to softmax