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ECE-469: Artificial Intelligence

Description of Data Set

After implementing a single hidden layer neural network, I decided to use Ronald

Fisher's Iris Flower Data set taken from UC Irvine's Machine Learning database. I chose this data

set because I attended Google's "Intro to Machine Learning" seminar a while back and this

particular dataset was used as their primary example.

The dataset consists of 120 training examples and 30 testing examples. The data was

shuffled using a short bash script to be split into training and testing examples. As for the initial

neural network, a script using a Gaussian random number generator with mean value of 0 and

standard deviation of 0.5 was used to generate edge weights between each node.

The network used for training consists of 4 input nodes, 5 hidden nodes, and 3 output

nodes. There are 4 input nodes because the dataset contains 4 parameters that feature petal

length, petal width, sepal length, and sepal width. I chose to have 3 output nodes because the

neural net will try to distinguish between 3 types of flowers: *setosa, virginica, and versicolor.*

Respectively, the output nodes will attempt to tell which flower it is. I went with 5 hidden

nodes because according to Morgan Kaufmann's *Practical Neural Network Recipes in C++*, the

rule of thumb for number of hidden nodes should be sqrt(n*m) where n is the number of input

layers, m is the number of output layers.

After a couple of iterations of training and testing, I found that an epoch of 100 and

learning rate of 0.5 seemed to be the sweet spot yielding precision close to perfect for the 30

testing examples.

As for executing the training/testing programs, you may refer to the make file that should be attached with the project. All in all, this was a very interesting project and a good eye-opener to the field of machine learning.