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CS 6673 fall 2016

Assignment 5 (100 points max), Due October 11, 2016
Submit a hardcopy before the start of class

Problem 1 (100 points max)

Problem 2 of assignment 1 involves a 2-2-1 neural network. Redo this problem but this time use bipolar input training vectors and bipolar neurons with bipolar sigmoid transfer function.

The training set is specified by the truth table of the `Xor` logic function:

x_1	x_2	y
1	1	-1
1	-1	1
-1	1	1
-1	-1	-1

The bipolar sigmoid transfer function is defined by

$$f_{\text{tansig}}(x) = \frac{1 - e^{-x}}{1 + e^{-x}} = \tanh(x/2).$$

Initialize the weights and biases to have random values between -0.5 and 0.5. Train the neural network using the vanilla version of the BackPropagation algorithm to find the weights and biases. Do not use any of the variations of the algorithm other than playing around with the training rate. You need to experiment on different ways of varying the training rate.

Try your best to get good robust results. Provide as much details as possible on your results. Comment on your findings.