

NEURAL NETWORKS (ELEC 5240 and ELEC 6240)

HOMEWORK 4

DUE: Thursday Sept 25

(1) Use the linear machine and minimum distance classification approach to find weights for a neuron, which divide the following two sets of patterns into two categories:

Category with desired output = 1

-1, 1.5; 0.5, 1; 2, 0.5;

Category with desired output = -1

-2, 1.5; -0.5, 1; 1, 0.5;

Report: Show your work. Draw patterns on the plane and resulted separation line. Draw the neuron circuit with weights. Comment your results

(2) Repeat problem (1) using the pseudo matrix inversion to find weights.

Report: Show your work. Draw patterns on the plane and resulted separation line. Draw the neuron circuit with weights. Comment your results

(3) Find suitable neural network architecture for the XOR problem using 3 neurons (2 hidden and one output neuron). Solve the problem analytically. Draw neural networks and indicate weight values.

Report: Draw input space separated by lines. Draw resulted neural network and indicate weight values. Comment your results