Assignment #8

No late assignments accepted!

ECE449, Intelligent Systems Engineering — Fall 2019

Department of Electrical and Computer Engineering, University of Alberta — Dr. Petr Musilek

Points: 10

Due: Thursday, November 21, 2019, 3:30 PM, in the assignment box in the ETLC atrium

Note: Show your work! Marks are allocated for technique and not just the answer.

Student Name:

ID Number:

1. [4 points] Briefly compare neurons used in a) perceptron-type networks and b) RBF-type networks. [Hint: concentrate on what they compare, how tot is calculated, and how neuron output is determined]

2. [6 points] Consider the modified Hebbian learning rule

$$w_{ij}^{new} = w_{ij}^{old}(1-\alpha) + hx_i o_j$$

and assume the following values $x_i = o_j = 1$, learning rate $\eta = 1$, forgetting factor $\alpha = 0.1$, and initial weight $w_{ij}^{old} = 0$.

a) Compare standard ($\alpha = 0$) and modified Hebbian learning by plotting weights over 30 subsequent learning steps (i.e. plot w_{ij}^{new} as a function of time) using the parameters provided.

b) Determine maximum value of weight *w* that can be obtained by modified Hebbian learning using the parameters provided [Hint: in the limit case, the values of w_{ij}^{new} and w_{ij}^{old} would be identical].