EE 550
Artificial Neural Networks
Homework 3

Due: 03/04/2020

Implementation of the Perceptron Model

1) Pick 60 arbitrary data points in 3-D space, 30 of which are in the 1^{st} quadrant ($x_1 > 0, x_2 > 0, x_3 > 0$) and the other 30 of which are in the 8^{th} quadrant ($x_1 < 0, x_2 < 0, x_3 < 0$). For training of the weights, use 40 data points (20 data points from each class).

2) Plot these two classes in a 3-D space.

3) Build the perceptron model.

4) Update the weights and obtain w_1, w_2, w_3, θ values using 40 training samples.

5) With the trained model weights, plot the decision plane along with sample data points in the same plane.

6) Test the model with the training remaining 20 samples. Plot the output for at least 4 data points from this test data set.

7) Plot the cost function vs iteration index.

NOTES:

1) Please upload all your files (codes and report) to Moodle with the file convention

2) There will be a demo after due date. During demo, you will asked to download your code from Moodle and run it.

3) Plagiarism will not be tolerated.

4) Late submission will not be accepted.