Neural Network Theory and Applications
Homework Assignment 4

March 30, 2017
Due at April 12, 2017

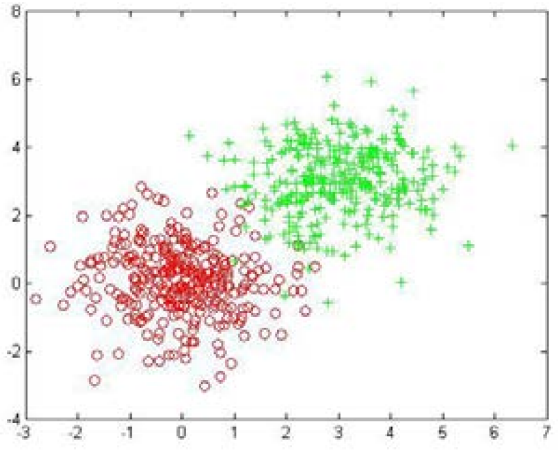
Problem one

Requirement

1. Implement the Self-Organizing Map algorithm.
2. Apply SOM to the given data.
3. Use $5 * 5$ neurons.
4. Try different Gaussian neighborhood function and learning rate η(n).

Dataset

The dataset (hw4-data.txt) contains 600 2-dimensional points from two gauss distribution, N(0,1), N(3,1), respectively.



The data file format:

dim1 value	dim2 value
-4.7292864e-001	3.4139773e-001

Problem two

Requirement

1. Apply your SOM to the given EEG data.
2. Try different neurons. (14∗21 are recommended.)
3. Visualizing your results.

Dataset

The dataset (hw4-EEG.mat) can be imported by matlab or other tools.

The feature matrix (EEG_X) includes 3394 samples and each sample contains 310 features. The EEG data was recorded when the subject was required to watch different types of movies. You are supposed to use your SOM to cluster the data and visualize your results.

You can read this paper(**http://bcmi.sjtu.edu.cn/ blu/papers/2014/6.PDF**) to get more information about this dataset.