Project 2

for NeuroComputing/Theoretical Neuroscience 2016

This assignment has three parts and is due Tuesday, Feb 9 by the end of the day by email to NeuroCompDal@gmail.com.

Part 1:

Reproduce Fig 3.18 with Izikevich neurons and a population rate model. Plot the figure and explain briefly your implementations including values of parameters

Part 2:

a. Implement a single-layer perceptron and train it to translate the digital letters given in file *pattern1* into the corresponding ASCII representation. Plot a training curve and interpret your results.

b. Implement an MLP and train it to translate the digital letters given in file *pattern1* into the corresponding ASCII representation. Plot a training curve and interpret your results.

c. Investigate how much noise the different perceptrons (with and without hidden nodes) can tolerate in the pattern before being unable to recognize a letter.

d. Which letter is represented in file *pattern2*?

Part 3:

This part is about applying an MLP perceptron to any data you find interesting (e.g. from the UCI Machine Learning repository at http://archive.ics.uci.edu/ml/) or your own data. Explain briefly the performance and/or possible problems.