Neural Networks

notes on feedforward nets
other network architectures
code demos

CompNeuro 2012
http://pybrain.org

high-level routines for building and training nnets

PyBrain code demos

• mnist/mnist_pybrain.py (short code)
• mnist/mnist_pybrain2.py (even shorter!)
MATLAB

neural network toolbox

- high-level functions
- GUI-style network builders and tools

MATLAB code demos

- mnist/go.m
Example: Vowel classification

Peterson & Barney (1952) original data

- 76 speakers (33 Male, 28 Female, 15 Children)
- 2 repetitions of 10 vowels = 1520 utterances
- acoustic measurements of “formants” (wiki)
- (F0, F1, F2, F3)
- MATLAB code demo on course website
Example: Face emotional expression

- Radboud Faces database
- MATLAB demo code on course website
assignment 6

• example code using conjugate gradient descent on course website

• your new assignment:
  1. explore how (a) number of hidden units, and (b) the cost on the sum of squared weights, affects the network’s classification of the input space
  2. (bonus): implement an additional hidden layer and explore how this affects the capability of the network to divide up the input space into classes