File: e:/courses/spring2006/434/hmwrk1.doc RWN 02/06-08/06 corrected

Homework 1 – due M 02/13/06
Submit important plots, etc., for grading

1. [50 points]

a) create input data points for the input P1 between –5 and +5 at 0.1 intervals

b) create the function $f(x)=x^5-3.2x^3+5x+10$ evaluated on the input P1; call the resulting data T1.

c) using newff make several feedforward networks to compare their performance
Use purelin at the (single neuron) output layer and tansig for all other layer activation functions. Compare and discuss the results of each of the cases:

c1) two layers with 6 neurons in the first layer and 1 neuron in the second layer

c2) two layers with 1 neuron in the first layer

c3) two layers with 2 neurons in the first layer

c3) five layers with 2, 3, 4, 5, 1 neurons in the respective layers

c4) five layers with 5, 5, 5, 5, 1 neurons in the respective layers

2. [50 points]

a) create a neural network for the single input single output digital filter of transfer function:
$T(z) = 2+3(1/z)+4(1/z)^2+5(1/z)^3$

b) apply the (impulse) input u(t) {=1 at t=0 and 0 for all other t } for $-3<t<+3$ and plot the output and the input.

c) repeat b) for the (unit step) input u(t) = {0 for $t<0$ and 1 for all other t}

d) repeat a)-c) when feedback is applied to give the transfer function
$T(z) = [2+3(1/z)+4(1/z)^2+5(1/z)^3]/[1+(1/z)+(1/z)^2+(1/z)^3]$