

NNV Help

Quick Start

Follow these brief steps to make NNV happen for you: (read the remainder of NNV Help for a detailed file and operation description)

Through the File menu, open a network file, then open an input file. Then resize the neurons if desired. Then click on the "Next Input Set" button in the main window for each input set desired. If output results are desired, choose Write Output from the File menu. At any time, you can choose Clear Output to erase any buffered output values.

That's It, good luck!

NNV Description

NNV (Neural Network Viewer) is an application which graphically displays a feed forward neural network where neurons are represented as filled colored circles and the connections with other neurons is represented by colored lines. It allows you not only display a neural network with various connection strengths, but it allows you to run input sets on the network and observe the activity within each neuron as well as capture the output(s) to a file.

Interface Controls

Within the Neural Network Viewer window are two user controllable options (neuron size, and Next Input Set). The neuron size slider merely adjust the graphical size of the neuron. The "NeXT Input Set" button when clicked causes NNV to read in the next set of input values from the .input file, calculate and display the activity within each neuron and buffer the output value(s). Once the end of the .input file is reached, you are warned and given the option to loop back to the top of the .input file or do nothing.

Color

If NNV is run on a NeXTstation color or NeXT Dimension system, the connection strengths and neuron activity will be represented with color. If NNV is run on a NeXTstation or NeXT Cube equipped with a 4-gray monitor, activity and strengths will be represented with dark and light grays and dithered for better numeric representation. On a color equipped system, red neurons represent very active neurons (activity = 1), blue neurons represent no activity in neuron (activity = 0), and various shades of red/blue depend on the activity, somewhere between 0 and 1. Red connections represent (+) connections. Blue connections represent (-) connections. Connection thickness varies with connection strength.

Menu Options

The Info menu leads to 2 choices: either the Info Panel, or this NNV Help window.

The File menu leads to 4 choices: either Open Input, Open Network, Write Output, or Clear Output.

In order to display and run input cases on a neural network, you must load 2 different files.

Open Network reads in a network description file with extension .network, and Open Input read in an input file with extension .input

.network

The format expected by NNV for a .network file is as follows: the first line contains one number (n) representing the number of neurons in the network. The next (n) lines contain the neuron connection matrix of numbers corresponding to the strength of the connections between neurons. From this file, the number of outputs of the network can be derived since the matrix columns on the right, corresponding to the outputs will contain 0's. The number of inputs of the network can also be derived from the top rows with all 0's. Call this matrix C with elements referenced as C_{ij} (i = row, j = col). C_{ij} is the strength of the connection from the j th to the i th neuron. Therefore, the network file might be called test.network and be stored as follows:

```
8
0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0
-.98 .7 .2 0 0 0 0 0
1 -.5 .9 .5 0 0 0 0
0 .37 -.26 0 0 0 0 0
0 .25 0 .04 .2 0 0 0
0 .05 0 .02 .12 .45 0 0
```

This example file contains a matrix which contains 3 inputs and 2 outputs with 3 neurons in the middle.

.input

The format expected by NNV for a .input file is as follows: each row in the .input file must contain as many numbers as inputs to the network opened. For example, using the .network file given above, we might have test.input as

```
0.45 0.35 0.26
0.24 0.56 0.87
0.79 0.88 0.12
```

0.75 0.99 0.99

0.5 0.5 0.5

0.25 0.25 0.25

where we have 3 input number (1 for each input neuron) and 6 input sets to cycle through.

The Write Output menu option allows you to save the output values to a file which were calculated by for each input set given to the network. At any time in the input set sequence, selecting the Clear Output menu option will clear the buffered output numbers so that only those output values calculated after will be buffered and potentially store with Write Ouput.

Developer Contact & Ordering Information

If you have any questions, comments or suggestions, bug(s) found, I can be reached at one of the following:

email: ferrerod@roma.eng2.uconn.edu

address: David J. Ferrero

91 Depot Rd.
Mansfield Depot, CT

06251

phone: (203) 429-4695