

The NWB Tool Basic Tutorial: Getting Started

Goals

This tutorial introduces the NWB tool. You will learn how to perform the following:

- Load a network
- View a network
- Save out a network in different file formats
- Understand the basic properties of a network using the Network Analysis Toolkit (NAT)

1. Load a Network into the NWB Tool

After downloading the NWB Tool for your specific operating system from <http://nwb.slis.indiana.edu/download.html> and installing it, launch the NWB tool. You should see a window that looks like Figure 1:

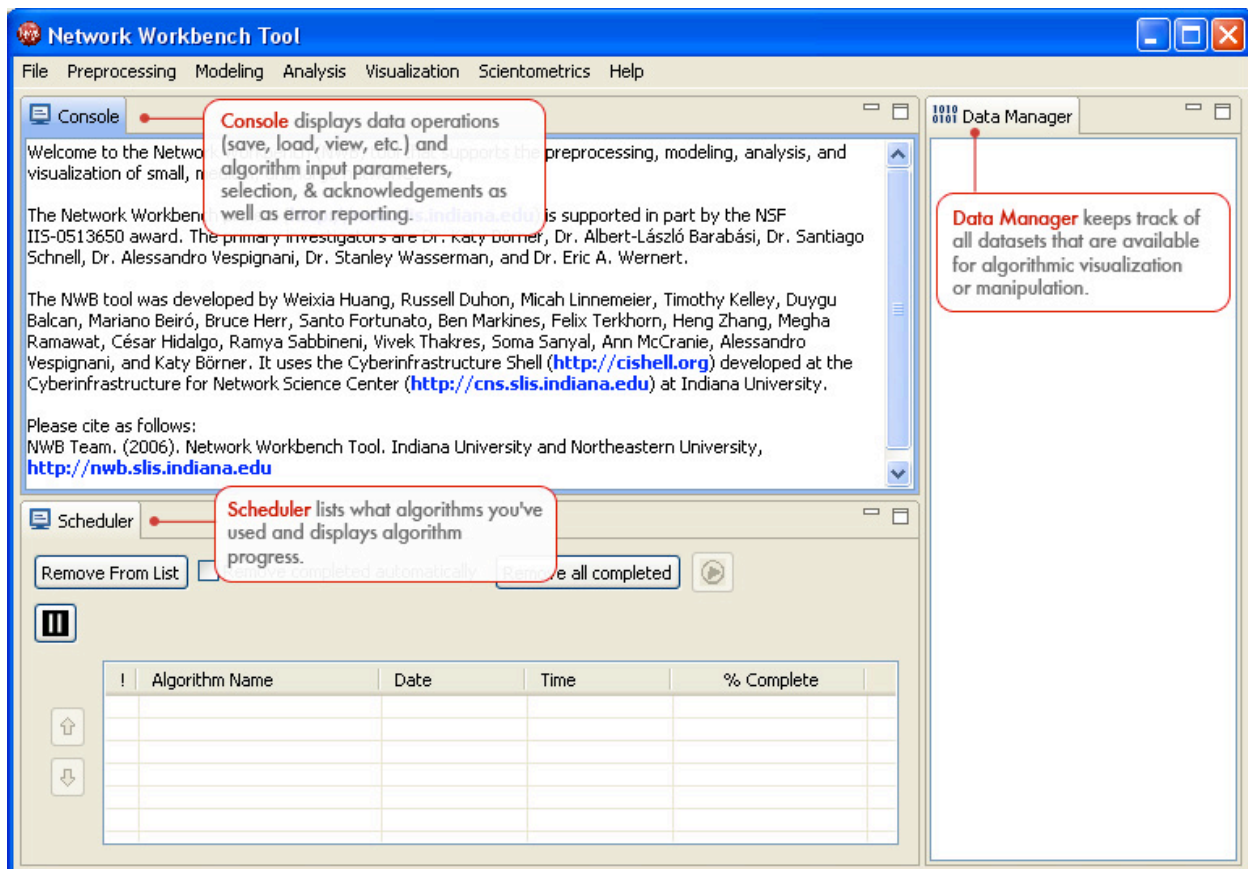


Figure 1: NWB Tool Main Window

To load a network, simply select **File** → **Load...** in the main menu and select a network file either from sample datasets provided by the NWB tool at `*NWB_Installation_Directory*/sampledata/network/filename` (see Figure 2) or from your own collection.

The NWB tool supports loading the following file formats for networks:

- GraphML (*.xml or *.graphml)
- XGMLL (*.xml)
- Pajek .NET (*.net)
- Pajek .Matrix (*.mat)

- NWB (*.nwb)
- TreeML (*.xml)
- Edge list (*.edge)

We also support a variety of other formats for working with scientific publication data. The [NWB Community Wiki](#) has more information on each of these data formats in [the Data Formats section](#).

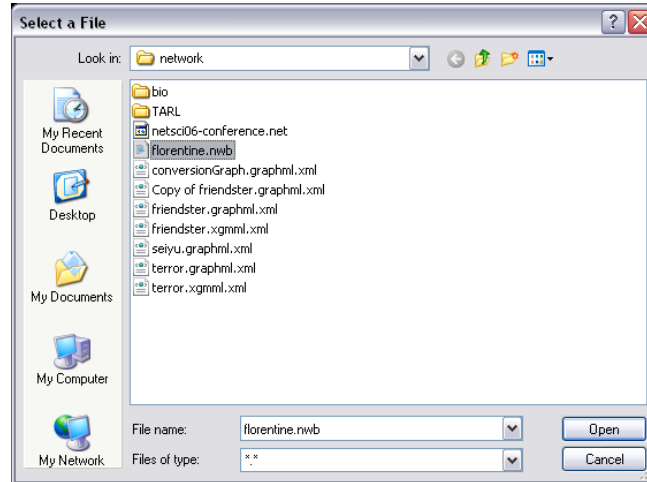








Figure 2: Load a sample network dataset

2. View a Network/Graph

Once the network is loaded, it shows up in the Data Manager window (see Figure 3) and can always be viewed in plain text using the -View- or -View With...- features in order to check the data contents. This is especially useful when you use datasets that you are not familiar with. While viewing the dataset, you can determine whether the network is directed or undirected, weighted or unweighted, the size of the network, etc. **Hint:** Datasets shown in the Data Manager window can be associated with the following icons:

-  Network
-  Tree
-  Table or csv file
-  Matrix data (Pajek .mat)
-  Plot – plain text file that can be plotted using gnuplot
-  Text - other text file

There are two ways to view a highlighted dataset displayed in the Data Manager window:

1. Click File → View... or File → View With...
2. Right-click the mouse, then from the drop-down menu click View... or View With...

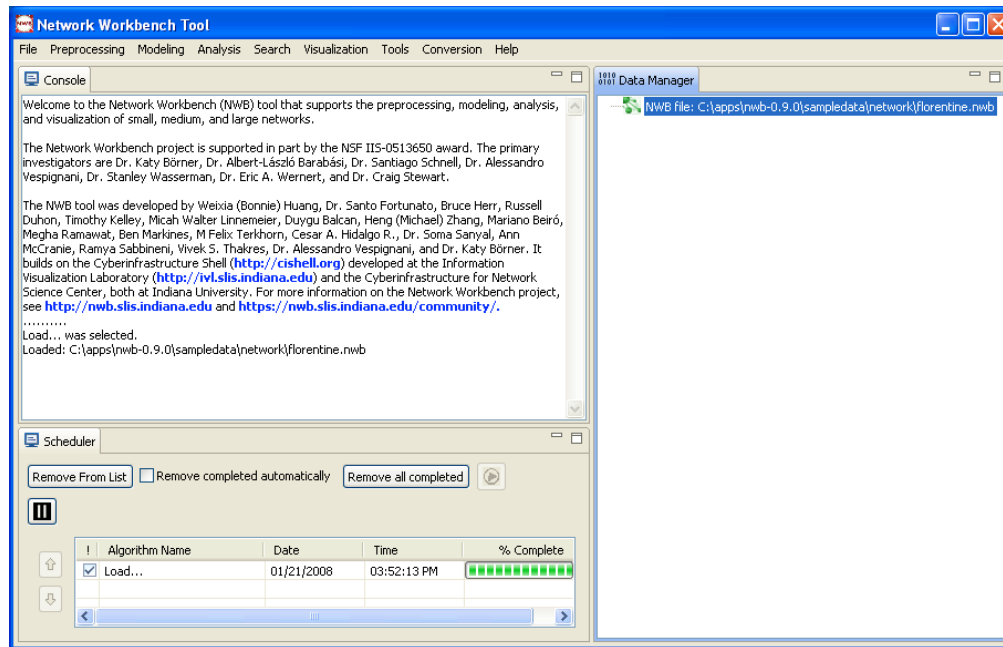


Figure 3: Display of loaded network in the Data Manager window

If the selected dataset in the Data Manager window is a file, File → View... will open the default text editor/viewer application of your system directly and display the file, while File → View With... provides three options, see Figure 4.

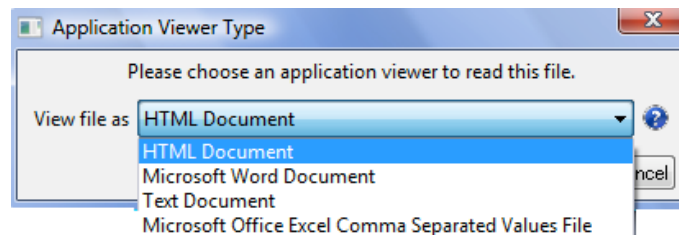


Figure 4: View With... Options

If the selected dataset shown in the Data Manager window is not a file but an in-memory Java object (which is like a file, only not currently saved to a file), both View... and View With... first generate a pop-up window to ask the user to choose a file format (similar to the Save window in Figure 5). After the user picks a desired file format and clicks the "Select" button, the tool will create a file with the specified format in a temporary directory and then display the created file.

3. Save a Network

The NWB tool can save a network to various file formats. Similar to the View and View With... features, there are two ways to save a highlighted dataset in the Data Manager window.

1. Click File → Save...
2. Right-click the mouse then from the drop-down menu, select Save.

For a network dataset, both saving mechanisms will lead users to a pop-up window shown in Figure 5.

Users can pick any desired output file format that the tool supports regardless of the currently selected dataset's format shown in the Data Manager.

Networks can be saved in the following file formats in the NWB tool:

- Pajek .MAT (*.mat)
- XGMML (*.xml)
- GraphML (*.xml or *.graphml)
- Pajek .NET (*.net)
- NWB (*.nwb)

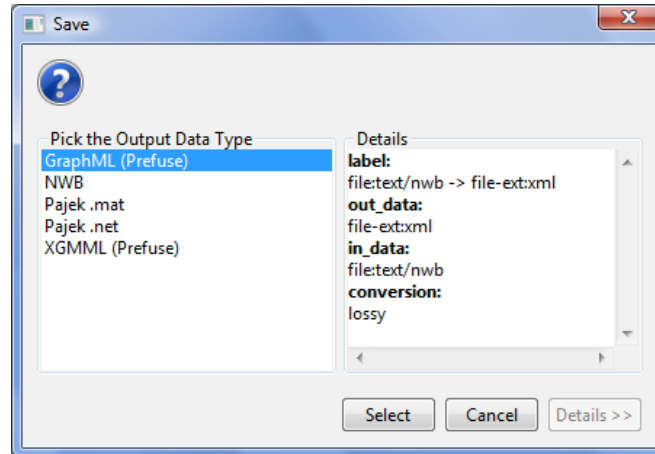


Figure 5: Save a network in the desired file format

To learn more about data converters and the data conversion service that supports the automated transformation among various network formats, please refer to the Data Converter Section in the NWB User Manual.

4. Understanding the Basics of a Network/Graph

Using Tools → Network Analysis Toolkit (NAT), the user can view the basic information about the highlighted dataset in the Data Manager window. This is useful especially when you are not familiar with the network datasets you are working with. While running NAT, you can get a quick overview of the network as follows:

- Whether the network is directed or undirected
- Number of nodes
- Number of isolated nodes
- A list of node attributes
- Number of edges
- Whether the network has self loops, if so, lists all self loops
- Whether the network has parallel edges, if so, lists all parallel edges
- A list of edge attributes
- Whether the graph is weakly connected
- Number of weakly connected components
- Number of nodes in the largest connected component
- Graph density

Acknowledgements

The Network Workbench project (<http://nwb.slis.indiana.edu/>) is supported in part by the NSF IIS-0513650 award.

This tutorial was compiled by Bryan J. Hook, Weixia (Bonnie) Huang, and Katy Börner. For comments, questions or suggestions, please post to the nwb-helpdesk@googlegroups.com mailing list.