JustClust User Manual

Contents

1. Installing JustClust

To install and run JustClust, you need Java, which you can download [here](#).

1. Download the [installer](#) for JustClust
2. Open your computer's command line interface
3. Browse to the directory which contains the installer
4. Run the installer with 'java -jar JustClustInstaller.jar'
5. Follow the instructions in the installation wizard

2. Running JustClust

JustClust should be accessible from your desktop and/or your application menu.
The following steps describe another way to start JustClust.

1. Open your computer's command line interface
2. Browse to the directory which contains the JustClust.jar file which was created during installation
3. Run JustClust with 'java -jar JustClust.jar'

# 3. Basic Usage of JustClust

There are four main stages in using JustClust.

- Creating a network from data in a file on your computer
- Clustering a network
- Applying a layout to the network
- Saving and loading the current session so that the above stages do not have to be repeated

The following sections will describe these in detail.

3.1. Creating a Network

1. To create a network, while in the program, go to 'File' > 'New Network from File...'
2. A box will appear with fields which you must fill in order to read data into JustClust
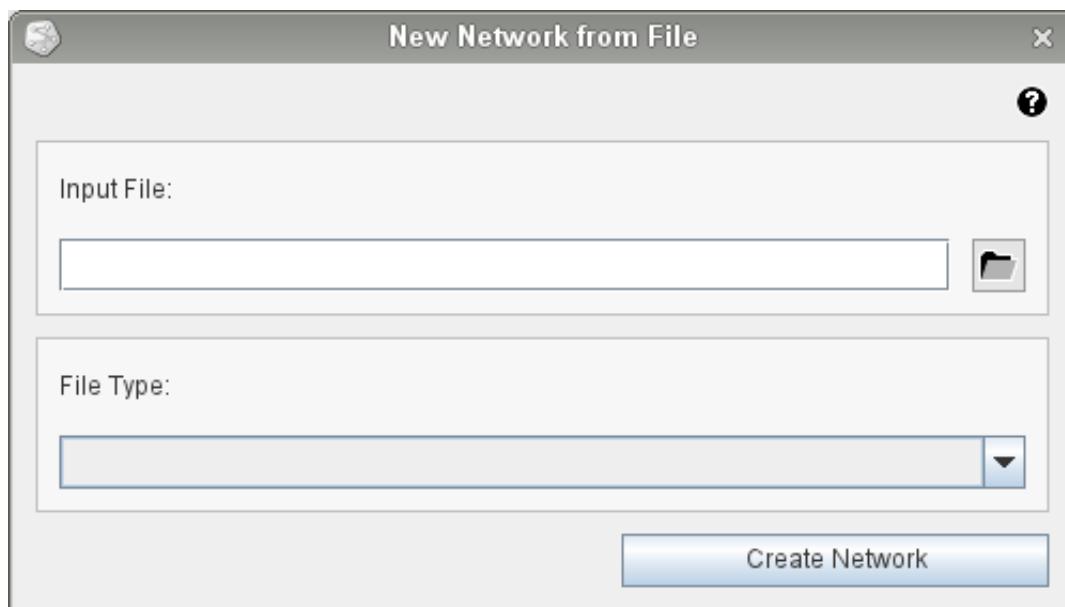
3. Click on the button with the folder icon and select the file on your computer which you would like JustClust to read
4. The 'File Type' drop-down box will be populated with file types
5. Choose one of the file types in the 'File Type' drop-down box
6. Click on the 'Create Network' button

3.2. Clustering a Network

1. To cluster a network, while in the program, go to 'Cluster Analysis' > 'Cluster Network...'
2. A box will appear with a field which you must fill in order to cluster the network
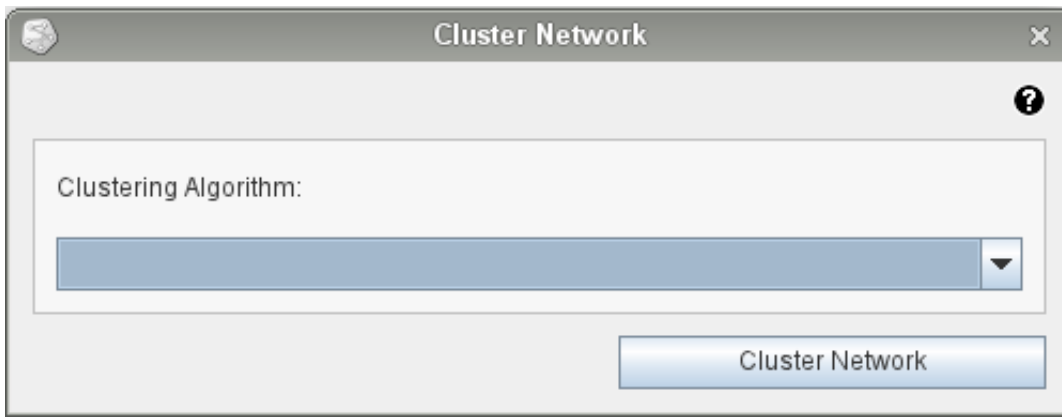
3. Choose one of the clustering algorithms in the 'Clustering Algorithm' drop-down box
4. Click on the 'Cluster Network' button

The above steps will create a new tab in JustClust which will contain the clustering.

3.3. Applying a Layout

1. To change the layout of a network, while in the program, go to 'Visualisation' > 'Apply Layout...'
2. A box will appear with a field which you must fill in order to apply a layout to the network
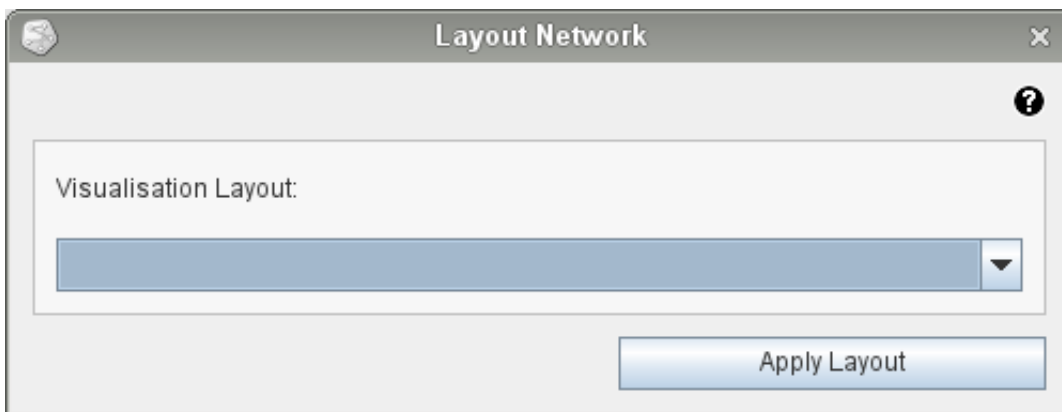

3. Choose one of the visualisation layouts in the 'Visualisation Layout' drop-down box
4. Click on the 'Apply Layout' button

You can also manually change the layout of a network by left-clicking on nodes and dragging them around. Other controls for the network include zooming by holding down the right mouse button and moving the mouse vertically, and panning with the keyboard arrow keys.

3.4. Saving and Loading a Session

Your current session in JustClust can be saved and loaded into/from files on your computer.

1. To save a session, while in the program, go to 'File' > 'Save' > 'Session...'
2. A box will appear with a field which you must fill in order to save the session
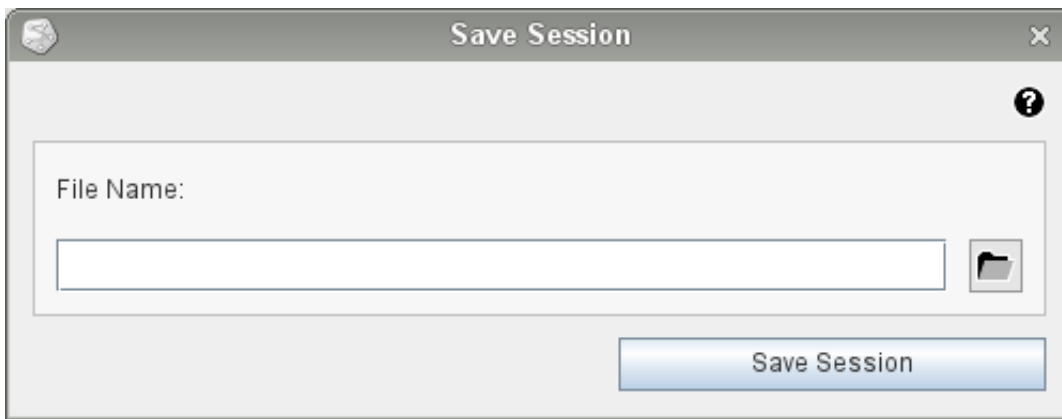
3. Click on the button with the folder icon and enter the name of the file you would like to save into

4. Click on the 'Save Session' button

1. To load a session, while in the program, go to 'File' > 'Load' > 'Session...'

2. A box will appear with a field which you must fill in order to load the session
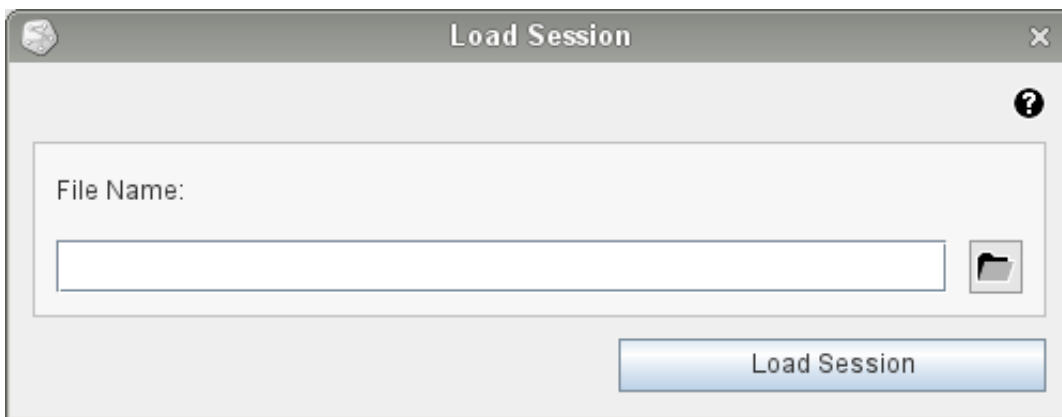
3. Click on the button with the folder icon and select the file on your computer which you would like JustClust to read

4. Click on the 'Load Session' button

4. Exporting Data

With JustClust, you can export details about a network or clustering into a simple text file so that they can be examined outside of JustClust and in an easy-to-read format.

It is also possible to export a graph image into a high-resolution image file, which is suitable for use in a presentation or publication.
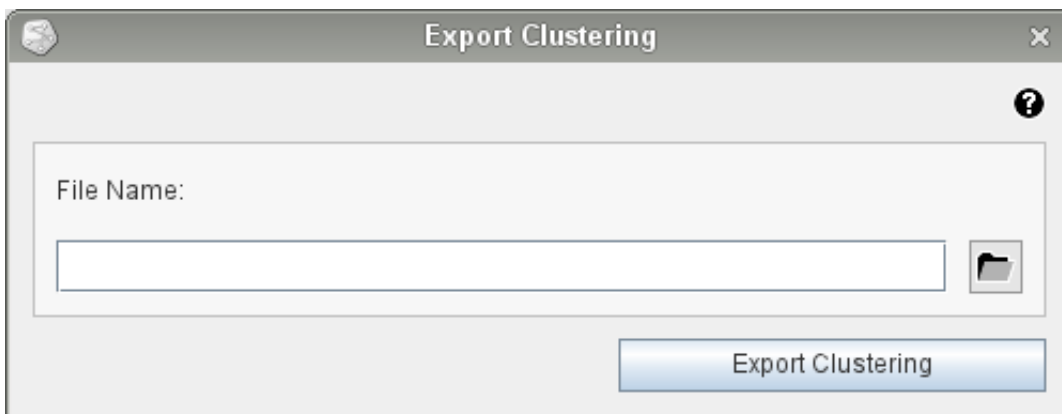
4.1. Exporting a Network

1. To export a network into a text file, while in the program, go to 'File' > 'Export' > 'Network as Text File...'

2. A box will appear with a field which you must fill in order to export the network
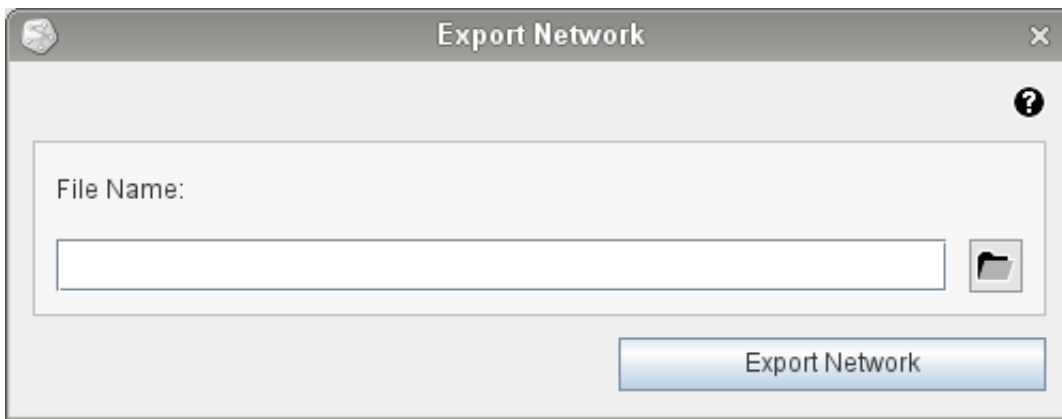
3. Click on the button with the folder icon and select the file on your computer which you would like to save into

4. Click on the 'Export Network' button

4.2. Exporting a Clustering

1. To export a clustering into a text file, while in the program, go to 'File' > 'Export' > 'Clustering as Text File...'

2. A box will appear with a field which you must fill in order to export the clustering

3. Click on the button with the folder icon and select the file on your computer which you would like to save into

4. Click on the 'Export Clustering' button

4.3. Exporting a Graph Image

1. To export a graph image into an image file, while in the program, go to 'File' > 'Export' > 'Graph as Image File...'

2. A box will appear with a field which you must fill in order to export the graph image
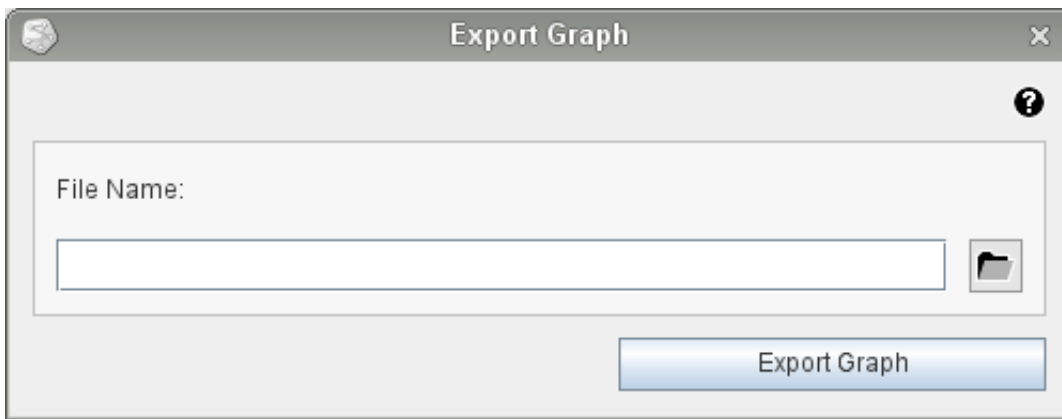
    3. Click on the button with the folder icon and select the file on your computer which you would like to save into

    4. Click on the 'Export Graph' button

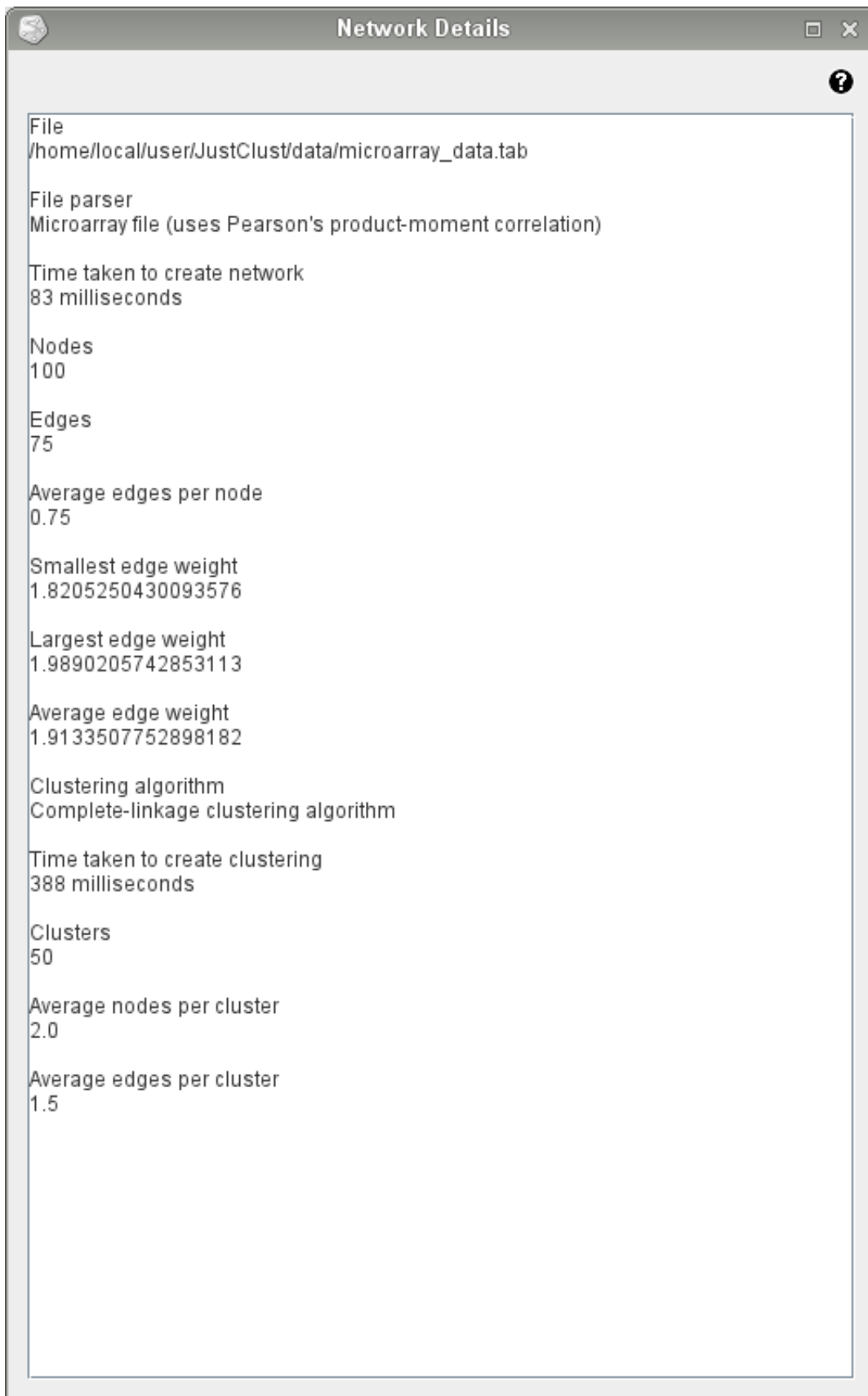A graph image can be saved as a PNG, JPG, PDF, or SVG file.

5. Toolbar Buttons

The toolbar to the left of JustClust's main graphical user interface contains 11 buttons.
Each button opens a new window which will allows you to observe and alter information about the current session.

5.1. The Network Details Button

The network details dialog shows you information about the current network or clustering.

❓

```
File
/home/local/user/JustClust/data/microarray_data.tab

File parser
Microarray file (uses Pearson's product-moment correlation)

Time taken to create network
83 milliseconds

Nodes
100

Edges
75

Average edges per node
0.75

Smallest edge weight
1.8205250430093576

Largest edge weight
1.9890205742853113

Average edge weight
1.9133507752898182

Clustering algorithm
Complete-linkage clustering algorithm

Time taken to create clustering
388 milliseconds

Clusters
50

Average nodes per cluster
2.0

Average edges per cluster
1.5
```

5.2. The Network Nodes Button

The network nodes dialog allows you to alter the label, visibility, and colour of each node in the current network or clustering.

There are also links for each node to online databases with information about the biological entity which the node represents.

	Label	Visible	Colour	Search Database
All		☑		
1	AFFX-BioB-5_at	☑		Link to... ▼
2	AFFX-BioB-M_at	☑		Link to... ▼
3	AFFX-BioC-3_at	☑		Link to... ▼
4	AFFX-BioC-5_at	☑		Link to... ▼
5	AFFX-BioDn-3_at	☑		Link to... ▼
6	AFFX-BioDn-5_at	☑		Link to... ▼
7	AFFX-CreX-3_at	☑		Link to... ▼
8	AFFX-CreX-5_at	☑		Link to... ▼
9	AFFX-DapX-3_at	☑		Link to... ▼
10	AFFX-DapX-5_at	☑		Link to... ▼
11	AFFX-DapX-M_at	☑		Link to... ▼
12	AFFX-Dr-AB076373-1_at	☑		Link to... ▼
13	AFFX-Dr-AF292559-1_at	☑		Link to... ▼
14	AFFX-Dr-AF292559-2_s_at	☑		Link to... ▼
15	AFFX-Dr-AF292559-3_s_at	☑		Link to... ▼
16	AFFX-Dr-AF292559-4_s_at	☑		Link to... ▼
17	AFFX-Dr-AF292560-1_s_at	☑		Link to... ▼
18	AFFX-Dr-AF298789-1_at	☑		Link to... ▼
19	AFFX-Dr-AF323980-1_at	☑		Link to... ▼
20	AFFX-Dr-AJ002682-1_s_at	☑		Link to... ▼
21	AFFX-Dr-AJ002682-2_s_at	☑		Link to... ▼
22	AFFX-Dr-AJ132968-1_at	☑		Link to... ▼
23	AFFX-Dr-AY056050-1_at	☑		Link to... ▼
24	AFFX-Dr-AY342347_s_at	☑		Link to... ▼
25	AFFX-Dr-ECOLOXB_at	☑		Link to... ▼
26	AFFX-Dr-ECOLOXL_at	☑		Link to... ▼
27	AFFX-Dr-GAPDH-3_at	☑		Link to... ▼
28	AFFX-Dr-GAPDH-5_at	☑		Link to... ▼
29	AFFX-Dr-GAPDH-M_at	☑		Link to... ▼
30	AFFX-Dr-J01347-1_s_at	☑		Link to... ▼
31	AFFX-Dr-J01347-2_at	☑		Link to... ▼
32	AFFX-Dr-J01347-3_at	☑		Link to... ▼
33	AFFX-Dr-J01347-4_at	☑		Link to... ▼
34	AFFX-Dr-J01636-1_at	☑		Link to... ▼

5.3. The Network Edges Button

The network edges dialog allows you to alter the label, visibility, and colour of each edge in the current network or clustering.

For each edge, which nodes the edge connects are displayed along with the weight of the edge.

	Label	Visible	Colour	Node 1	Node 2	
All		✔	⬛			
1		✔	🟧	AFFX-Dr-pAsRe...	AFFX-Dr-U5760...	1
2		✔	🟩	AFFX-r2-Bs-dap...	AFFX-BioDn-5_at	1
3		✔	🟥	AFFX-r2-Bs-phe...	AFFX-LysX-3_at	1
4		✔	🟫	AFFX-Dr-J0134...	AFFX-Dr-AF298...	1
5		✔	🟦	AFFX-Dr-GAPD...	AFFX-Dr-AJ002...	1
6		✔	🟩	AFFX-Dr-acta1-...	AFFX-Dr-acta1-...	1
7		✔	🟪	AFFX-Dr-pDsRe...	AFFX-Dr-J0163...	1
8		✔	🟢	AFFX-ThrX-M_at	AFFX-BioC-3_at	1
9		✔	🟪	AFFX-LysX-M_at	AFFX-Dr-GAPD...	1
10		✔	🟪	AFFX-Dr-X5879...	AFFX-Dr-U5594...	1
11		✔	🟩	AFFX-Dr-AY056...	AFFX-Dr-AF292...	1
12		✔	🟦	AFFX-Dr-pd2EG...	AFFX-Dr-AJ002...	1
13		✔	🟪	AFFX-LysX-5_at	AFFX-Dr-U5594...	1
14		✔	🟩	AFFX-r2-Bs-thr-...	AFFX-Dr-AF323...	1
15		✔	🟩	AFFX-r2-TagB_at	AFFX-Dr-X0345...	1
16		✔	🟧	AFFX-TrpnX-5_at	AFFX-Dr-M1096...	1
17		✔	🟧	AFFX-Dr-U5760...	AFFX-Dr-J0134...	1
18		✔	🟩	AFFX-r2-Ec-bio...	AFFX-BioDn-5_at	1
19		✔	🟦	AFFX-DapX-M_at	AFFX-DapX-3_at	1
20		✔	🟪	AFFX-Dr-X5879...	AFFX-Dr-M6265...	1
21		✔	🟪	AFFX-Dr-GAPD...	AFFX-Dr-ECOL...	1
22		✔	🟧	AFFX-Dr-pAsRe...	AFFX-Dr-M1096...	1
23		✔	🟩	AFFX-r2-Ec-bio...	AFFX-r2-Bs-dap...	1
24		✔	🟧	AFFX-Dr-U5760...	AFFX-Dr-M1096...	1
25		✔	🟧	AFFX-Dr-pAsRe...	AFFX-Dr-J0134...	1
26		✔	🟧	AFFX-TrpnX-5_at	AFFX-Dr-J0163...	1
27		✔	🟪	AFFX-Dr-NM_13...	AFFX-Dr-J0163...	1
28		✔	🟫	AFFX-Dr-M5728...	AFFX-Dr-GAPD...	1
29		✔	🟦	AFFX-Dr-pd2EG...	AFFX-Dr-GAPD...	1
30		✔	🟥	AFFX-ThrX-5_at	AFFX-Dr-U8996...	1
31		✔	🟧	AFFX-TrpnX-5_at	AFFX-Dr-J0134...	1
32		✔	🟨	AFFX-Dr-S6941...	AFFX-Dr-AB076...	1
33		✔	🟩	AFFX-Dr-J0163...	AFFX-Dr-ECOL...	1
34		✔	🟧	AFFX-Dr-M1096...	AFFX-Dr-J0163...	1

5.4. The Network Clusters Button

The network clusters dialog allows you to alter the label, node visibility, edge visibility, node colour, and edge colour of each cluster in the current clustering.

For each cluster, the amount of nodes it contains is displayed along with which nodes it contains.

	Label	Nodes Visible	Edges Visible	Nodes Colour
All		✔	✔	
1		✔	✔	
2		✔	✔	
3		✔	✔	
4		✔	✔	
5		✔	✔	
6		✔	✔	
7		✔	✔	
8		✔	✔	
9		✔	✔	
10		✔	✔	
11		✔	✔	
12		✔	✔	
13		✔	✔	
14		✔	✔	
15		✔	✔	
16		✔	✔	
17		✔	✔	
18		✔	✔	
19		✔	✔	
20		✔	✔	
21		✔	✔	
22		✔	✔	
23		✔	✔	
24		✔	✔	
25		✔	✔	
26		✔	✔	
27		✔	✔	
28		✔	✔	
29		✔	✔	
30		✔	✔	
31		✔	✔	
32		✔	✔	
33		✔	✔	
34		✔	✔	

5.5. The Search Network Button

    1. To search the current network or clustering for a node, edge, or cluster; enter part or all of the label of the item into the 'Search' text-field

    2. Click on the 'Search' button

All nodes, edges, and clusters whose labels contain the search term will be displayed.
All edges connected to a node whose label contains the search term will be displayed.

All clusters containing a node whose label contains the search term will be displayed.

Search Network

Search:

Search

Nodes:

Label

Node Options...

Edges:

Label	Node 1	Node 2	Weight

Edge Options...

Clusters:

Label

Cluster Options...

5.6. The Filter Clusters Button

The filter clusters dialog allows you to quickly make certain clusters in the current clustering invisible.
This may be useful if you want to focus only on clusters with a certain size or density.

1. To filter the current clustering, enter the relevant amounts into the various text-fields.
2. Click on the 'Filter Clusters' button

5.7. The Over-representation Analysis Button

1. To obtain probable functions for a cluster in the current clustering, click on the button with the folder icon by the 'Gene Ontology' text-field and select the gene ontology file on your computer which you would like to use
2. Click on the button with the folder icon by the 'Gene Ontology Annotations' text-field and select the gene ontology annotations file on your computer which you would like to use
3. Select the row in the 'Cluster to Analyse' table which contains the cluster you would like to analyse
4. Click on the 'Analyse Over-representation' button

The over-represented functions will be displayed in the 'Functions for Cluster' table.

5.8. The Heat Map Button

The heat map dialog displays a heat map for the current network or clustering.

You can reduce the size of the heat map by unchecking the 'Include Labels' check-box.

You can see the weight of an edge between two nodes in the 'Edge Weight' text-field by hovering the cursor over the corresponding square in the heat map.
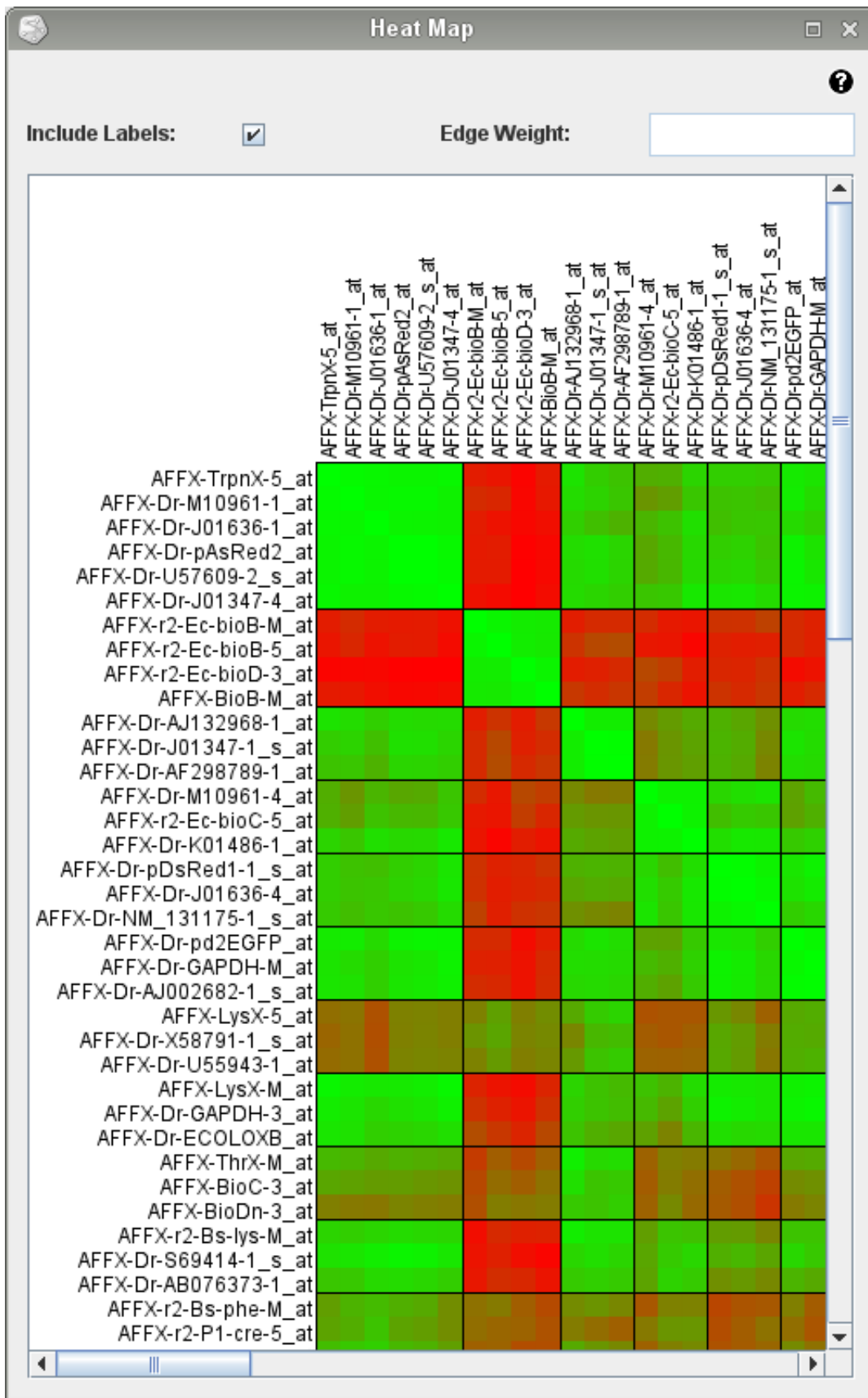
5.9. The Microarray Heat Map Button

The microarray heat map dialog is only available for microarray data, and displays a heat map of the microarray values for the current network or clustering.

You can reduce the size of the microarray heat map by unchecking the 'Include Labels' check-box.

You can see the microarray value of a node in the 'Microarray Value' text-field by hovering the cursor over the corresponding square in the microarray heat map.
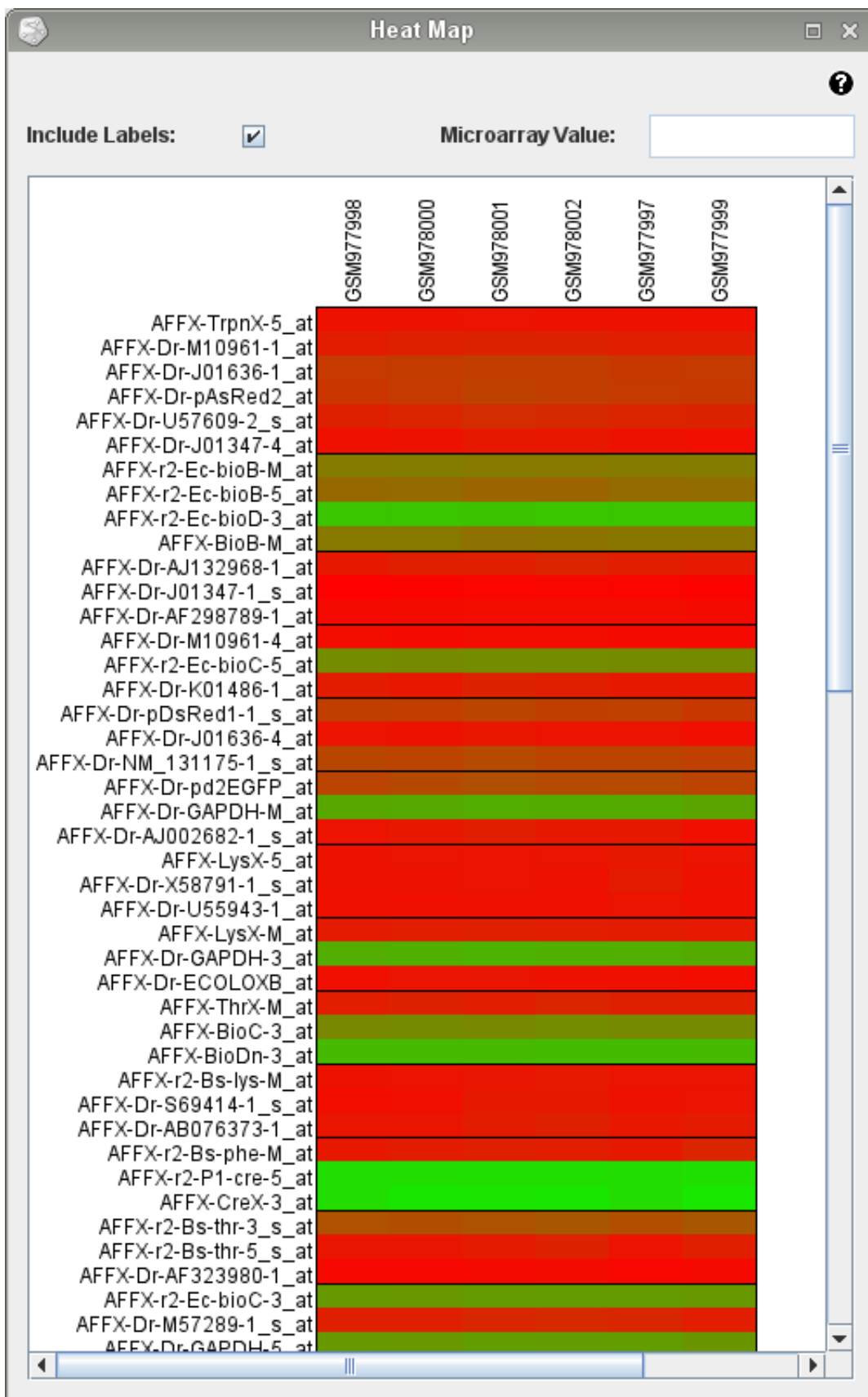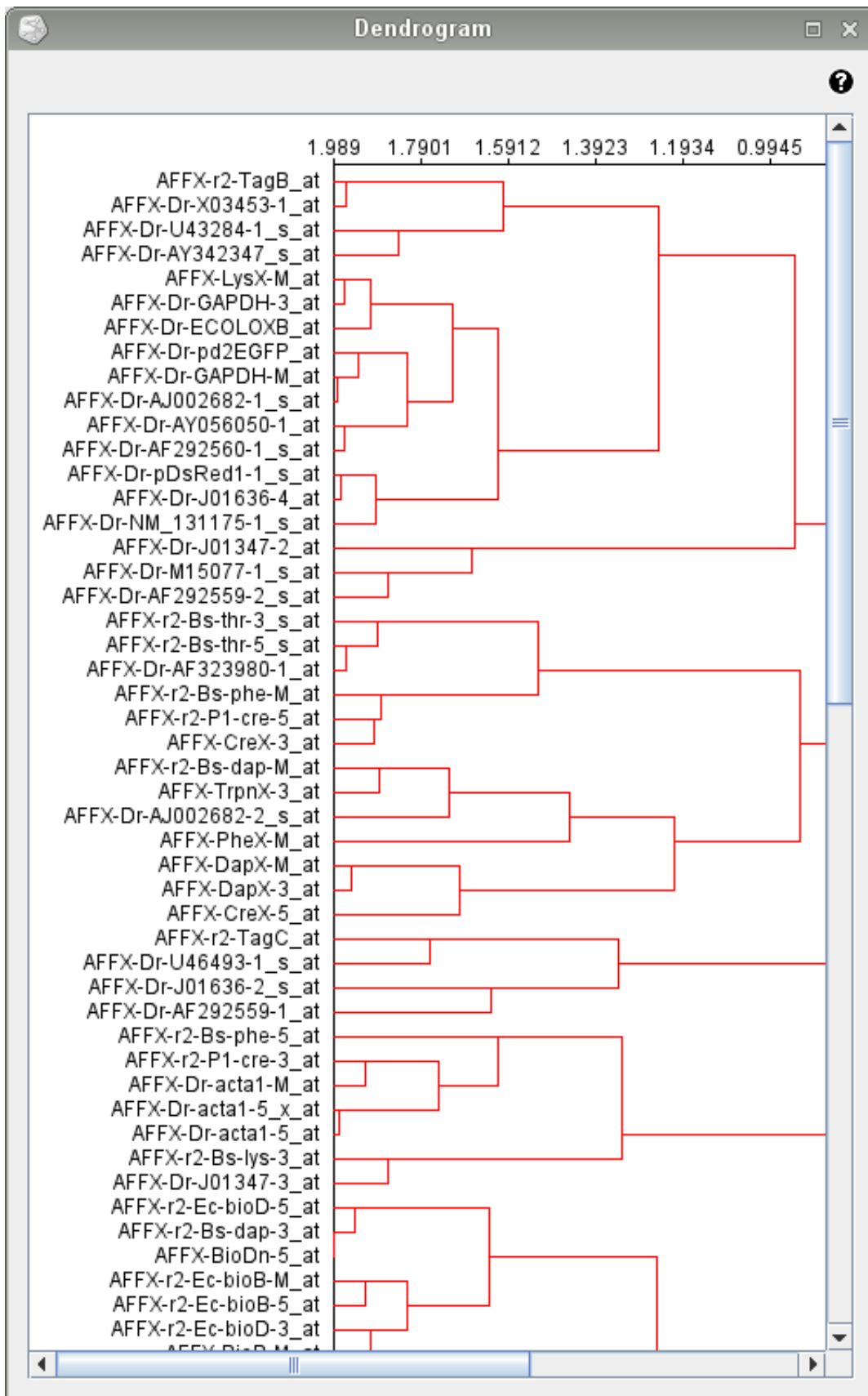
5.10. The Dendrogram Button

The dendrogram dialog is only available for clusterings which have been created by a hierarchical clustering algorithm.
It displays a dendrogram for the current clustering.

5.11. The Manage Plug-ins Button

    1. To load file parsing plug-ins into JustClust, click on the 'File Parsers' tab
    2. Click on the button with the folder icon by the 'Parsing Plug-ins Path' text-field and select the folder on your computer which contains the file parsing plug-ins you want to load
    3. Click on the 'Load Parsing Plug-ins' button

The file types which can be parsed by the file parsing plug-ins you have loaded will be displayed in the 'File

Types for Loaded Parsing Plug-ins' combo-box.

    1. To load clustering algorithm plug-ins into JustClust, click on the 'Clustering Algorithms' tab
    2. Click on the button with the folder icon by the 'Clustering Plug-ins Path' text-field and select the folder on your computer which contains the clustering algorithm plug-ins you want to load
    3. Click on the 'Load Clustering Plug-ins' button

The clustering algorithm plug-ins you have loaded will be displayed in the 'Loaded Clustering Plug-ins' combo-box.

    1. To load visualisation layout plug-ins into JustClust, click on the 'Visualisation Layouts' tab
    2. Click on the button with the folder icon by the 'Visualisation Plug-ins Path' text-field and select the folder on your computer which contains the visualisation layout plug-ins you want to load
    3. Click on the 'Load Visualisation Plug-ins' button

The visualisation layout plug-ins you have loaded will be displayed in the 'Loaded Visualisation Plug-ins' combo-box.