NAVIGATING NETWORKS

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Navigating Networks: The Navigating Networks Interface

The Navigating Networks service provides an interactive interface for exploring and analysing networks of artistic collaborations in the AusStage database.

Network visualisation and analysis can reveal patterns of collaboration between artists that have previously been unrepresentable using conventional text-based displays. This service presents existing data in new ways, allowing researchers to interrogate the collaborations that underpin creativity in the performing arts.

The home page for the Aus-e-Stage Navigating Networks interface (*Figure 1*) is at: http://beta.ausstage.edu.au/networks/

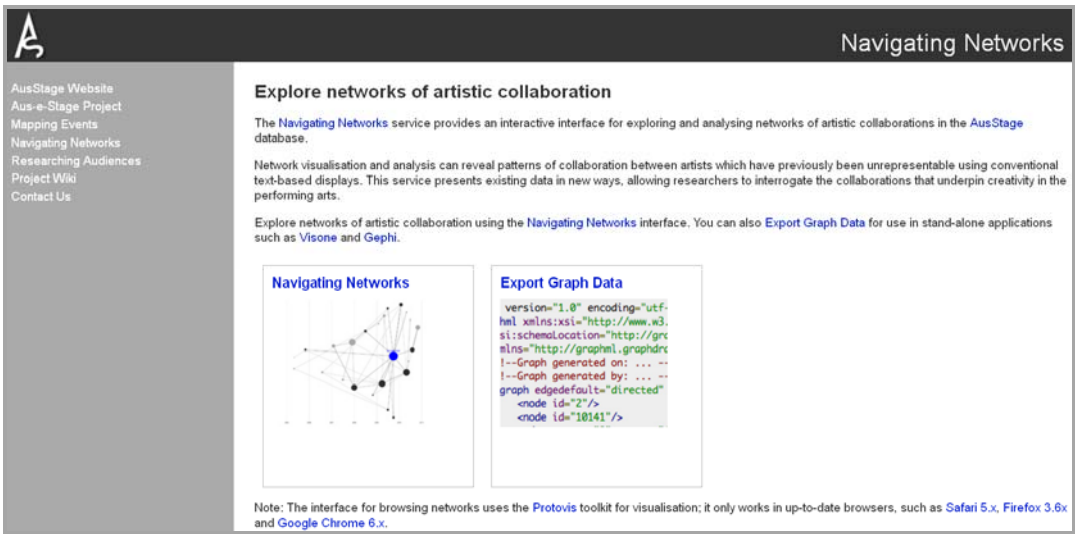


Figure 1: The Navigating Networks home page

Note: The web interface for browsing networks uses the Protovis toolkit for visualisation and will only work in up-to-date browsers, such as Safari 5.x, Firefox 3.6x and Google Chrome 6.x.

Navigating Networks: Terms and Concepts

Networks represents things and their relationships. A **network** is visualised as set of things linked by lines representing their relationships. Network visualisations are sometimes called **graphs**. The things that make up a network are referred to as **nodes**; nodes are also sometimes called vertices or points. The relationships in a network graph are referred to as **links**; links are sometimes called edges or lines.

In AusStage, we focus on relationships between contributors and events. A contributor is an individual, usually a person, who contributes in some capacity to the conception, production or presentation of an event. An event is a distinct happening defined by title, date/s and venue; typically, a performance or series of performances at a venue. There are two ways we can look at the relationship between contributors and events.

Contributor network: We can visualise a network of contributors linked by the events they have collaborated on. A contributor network is centred on one contributor. It shows all the contributors who have collaborated with the central contributor, and all of their collaborations with each other.

Event network: We can also visualise a network of events linked by their contributors. An event network is centered on one event. It shows the events that contributors were working on before and after the central event.

Navigating Networks: Emergent Principles

A set of principles emerged during our research on networks in AusStage. These principles guided the development of the network interface.

A focus on artistic networks

While it is possible to use network analysis to visualise various relationships between different entities (organisations, events, venues, genres and so on), our focus is on the artistic networks articulated through the relationships between contributors and events. There is a realism to this focus which reflects the collaborative ethic of the performance arts and the obligations of co-presence in the rehearsal room.

An awareness of complexity

The AusStage contributor network is large and complex. At June 2010, it comprised 1,634,088 relationships between 76,488 contributors. Visualisation efforts using dedicated software have succeeded in working on relatively small sub-networks (<20,000 edges, <2,000 nodes) constrained by contributor, or by association with a venue or organisation. Visualising networks for display in web browsers imposes additional constraints.

The necessity of focus+context

Our experience in using network visualisation for analysis is characterised by zooming in and out – zooming in to focus on particular artists and relationships, and zooming out to grasp their position within the larger network. This experience is addressed by the interface principle of focus-plus-context (see http://www.infovis-wiki.net/index.php/Focus-plus-Context).

An interest in quality

Researchers are interested in articulating the significance and quality of artistic collaborations. While these interests imply qualitative research, there are three aspects of data available in AusStage which could assist researchers in identifying quality and significance of a relationship between two or more artists: the number of their collaborations, the frequency of their collaboration over time (and changes in the frequency), and their respective roles (and again, changes in roles over time).

The significance of time

The networks of artistic collaboration in the AusStage dataset are dynamic. They are time-coded by event and they change over time. Experiments in analysing network dynamics in the AusStage data suggest patterns of branching and consolidation, transitions in centrality, and sequences of growth, consolidation, release and reorganisation (Walker and Salt 2006). But approaches to analysing dynamic networks are at the leading edge of the field. Refining techniques for visualisation, including timelines, animation and 3D, will entail experimentation.

Navigating Networks: Search

The search page for the Aus-e-Stage Navigating Networks interface (*Figure 2*) is at http://beta.ausstage.edu.au/networks/networks.html

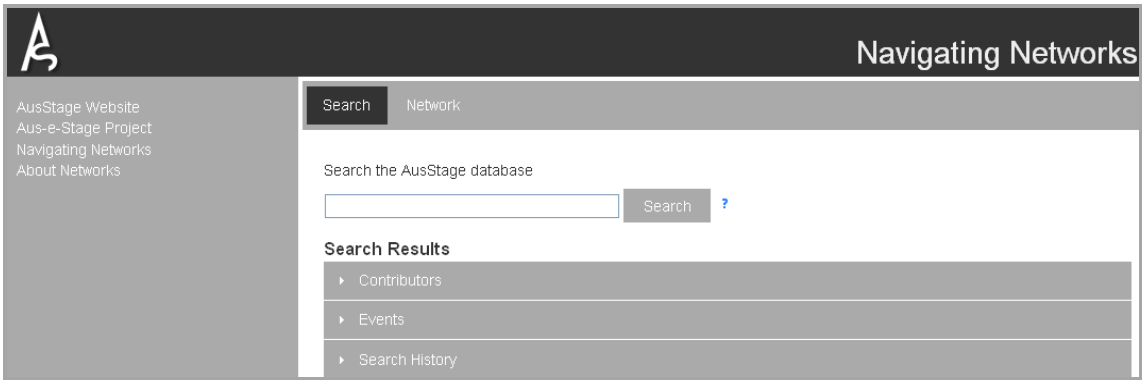


Figure 2: The Navigating Networks interface

The Navigating Networks search retrieves contributors and events that match all your search terms. Type double quotation marks ("") around search terms for exact phrase searching.

Records with matching alternate or previous names will also be retrieved. Please wait for the search to complete before exploring the results.

A maximum of 25 results will retrieved for each type of record. If you don't see what you are looking for, try refining your search terms. You could also try searching the main AusStage website.

Example Search

A search for “martha”, for example, results in matches with 17 contributors and 23 events, as shown with results expanded in the figure below. From your search results, you can browse either a contributor network or an event network.

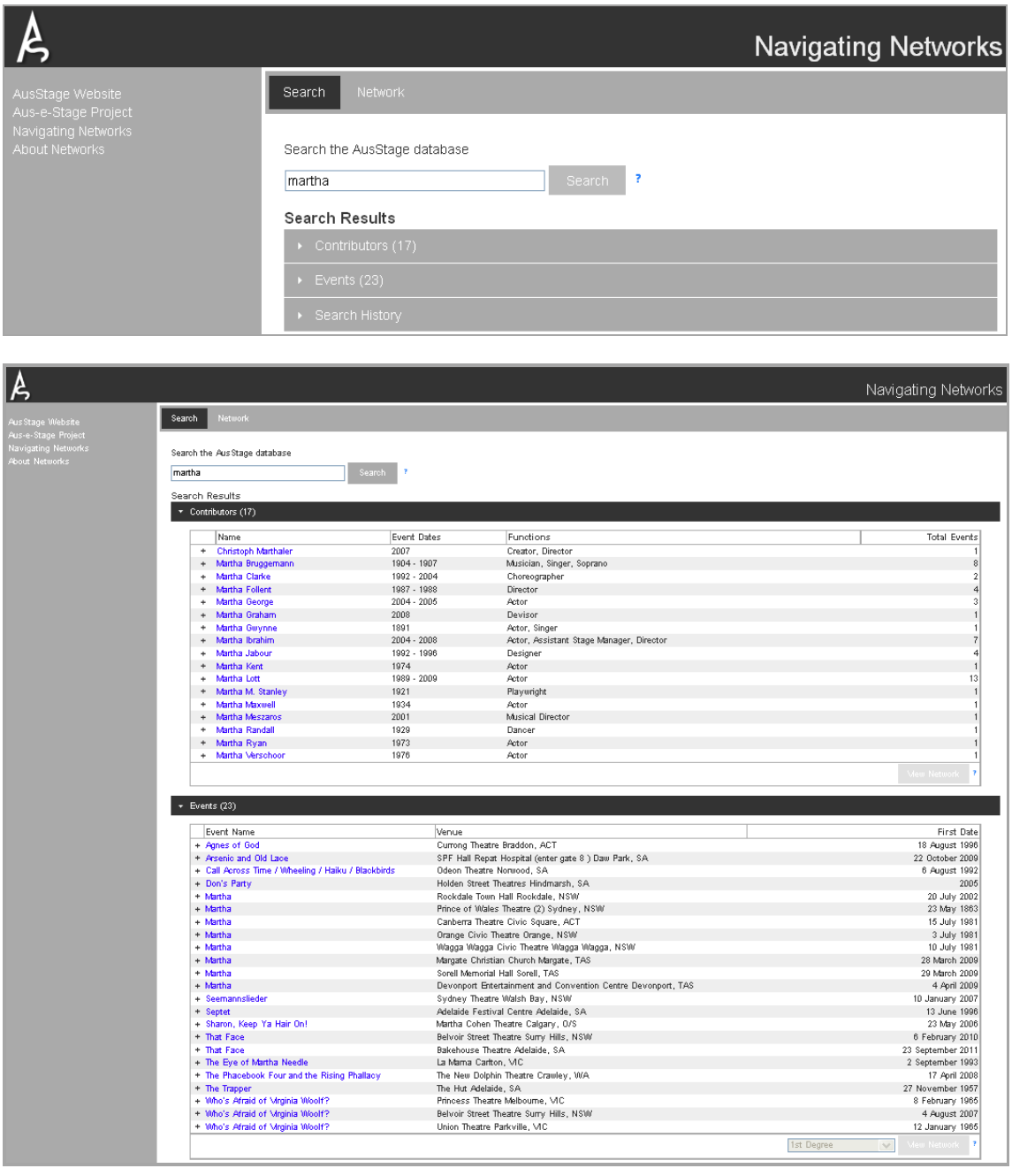


Figure 3: Navigating Networks Search for “martha”

Links to AusStage records

You may click on the Contributor or Event name on the search results screen to view the record in AusStage, as shown in the example in *Figure 4*.

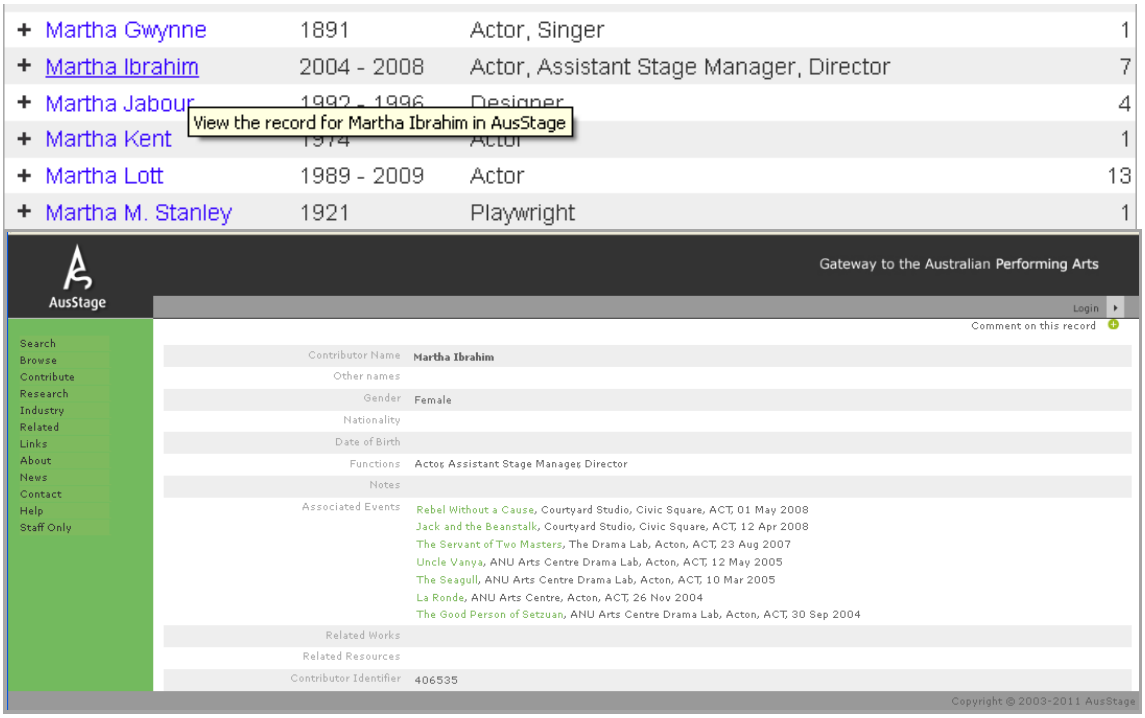


Figure 4: Contributor record link to AusStage record

Search History

Search history is available on the Navigating Networks Search History tab. Use this function to return to previous current session search results for viewing and re creating network graphics as desired. This option is located at the bottom of the search interface page as shown in *Figure 11*.

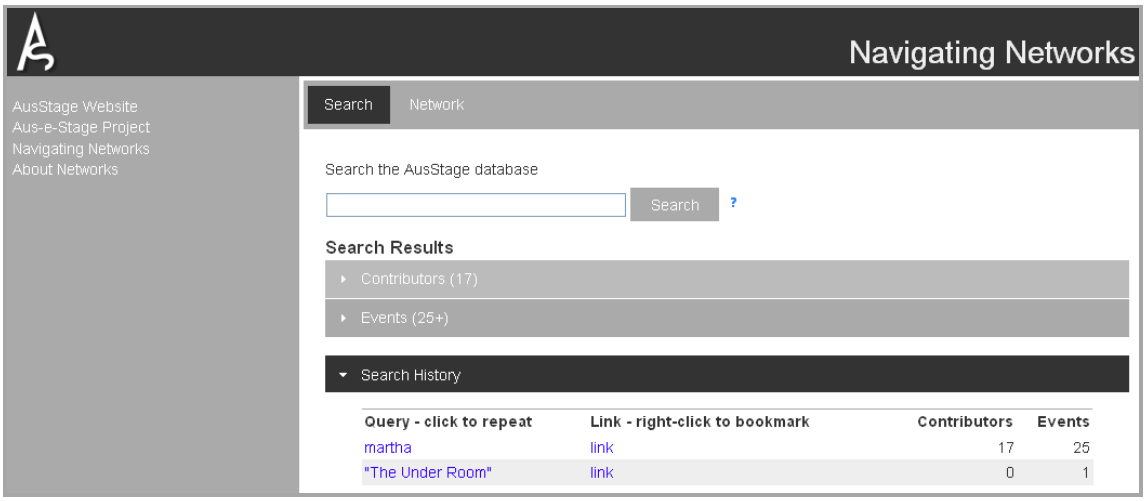


Figure 11: Navigating Networks Search History

Navigating Networks: Contributor Networks

A contributor network is centred on the selected contributor. It shows all the contributors who have collaborated with the central contributor, and all of their associations with each other.

To view a contributor network:

1. Click the **+** icon to select a contributor. Your selection is added beneath the contributor search results. You can click the **x** next to the contributor name to remove the contributor and make another selection.

2. Click the View Network button to see the network.

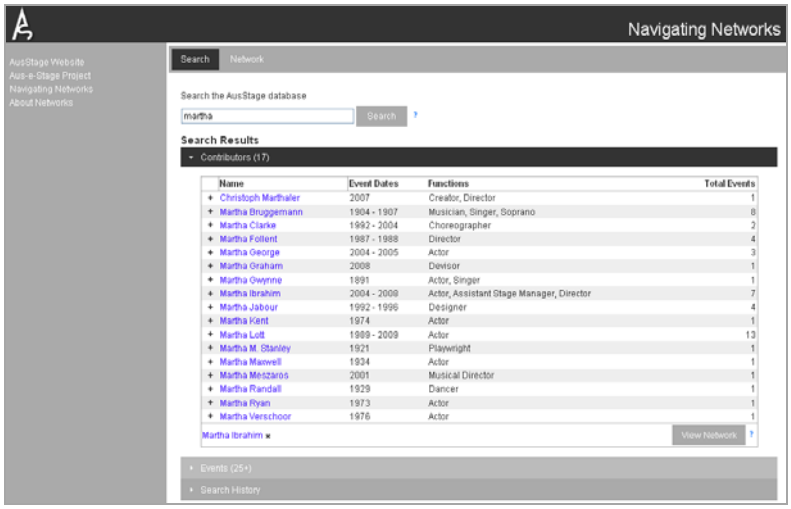
Retrieving network data

The underlying network data is often complex and may take a little time to process. Please be patient and allow time for the interface to retrieve data. A message is displayed while retrieving network data.

Figure 5: Retrieving network data message

Example Contributor Network

Figure 6 selects Martha Ibrahim from the “martha” search results to illustrate viewing a contributor network.



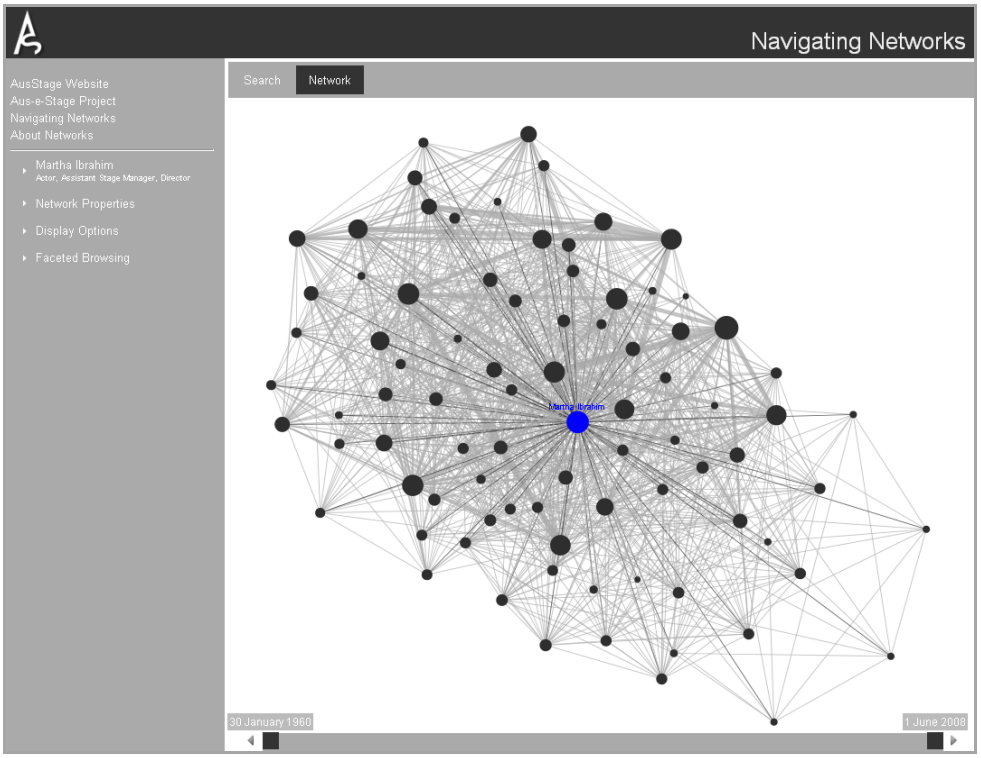


Figure 6: Selecting contributor Martha Ibrahim and viewing her contributor network

Navigating Networks: Contributor Network Display

In a contributor network, contributors are represented as round nodes. Larger nodes represent contributors who have worked with more contributors in the network. Smaller nodes represent contributors who have worked with fewer contributors in the network.

Collaborations between contributors are represented as lines. Thicker lines link contributors who have worked with each other on many events. Thinner lines link contributors who have worked with each other on fewer events.

Manipulate the network graphic using a mouse or trackpad. Reveal contributors names by hovering the pointer over nodes and lines. Re-arrange the network layout by clicking and dragging nodes.

Click on a contributor to select it. The selected contributor is coloured blue. Contributors who have collaborated with the selected contributor are coloured dark grey. Other contributors who have not directly collaborated with the selected contributor are coloured light grey.

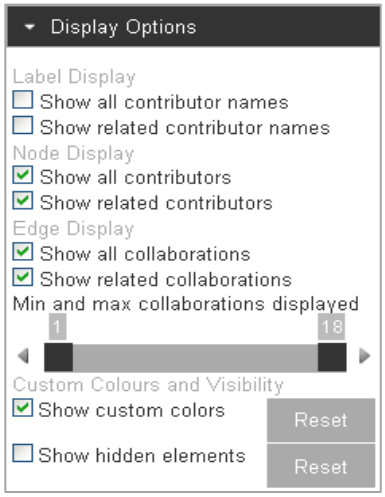
Click on a line to select the relationship between two contributors. The selected relationship is coloured blue. Only one contributor or one relationship may be selected at a time.

Zoom in and out of the network by using the mouse scroll-wheel. Pan the whole network by clicking and dragging in space around the network.

Information about the network is displayed in the sidebar to the left. Controls for adjusting the display and saving the network are also provided.

Display

Change the way information is displayed in the network graphic by adjusting the options in the Display tab.



Label Display

Show all contributor names: Check to display the names of all contributors in the network. Uncheck to hide all contributor names (see Figure 7).

Show related contributor names: Check to display only the names of contributors who have collaborated with the selected contributor. *Show all contributor names* must be unchecked.

Node Display

Show all contributors: Check to display the nodes of all contributors in the network. Uncheck to hide all contributor nodes.

Show related contributors: Check to display only the nodes of contributors who have collaborated with the selected contributor. *Show all contributors* must be unchecked.

Edge Display

Show all collaborations: Check to display the lines of all collaborations in the network. Uncheck to hide all collaborations.

Show related collaborations: Check to display only the collaborations involving the selected contributor. Show All Collaborations must be unchecked.

Min and max collaborations displayed: Use the slider to adjust the display of lines. Lines representing collaborations on a number of events that fall within the range are displayed. Lines representing collaborations a number of events that fall outside the range are hidden.

Custom Colours and Visibility

You can customise the display of individual nodes. Click on a node while holding down the ALT key (also called OPTION key on Mac). From the pop-up window you can: colour the node by selecting from the palette, remove a custom colour you have previously applied, and temporarily hide the node and its lines.

You can adjust the display of custom colours and hidden elements from the sidebar.

Show Custom Colours: Check to display the custom colours applied to nodes. Uncheck to view the default colours of hide the custom colours, uncheck the box. To remove all custom colours permanently click the corresponding Reset button.

Show Hidden Elements: Check to see elements that are individually hidden. Uncheck to hide all elements that are individually hidden. You can also use the corresponding Reset button to remove all customized hiding of elements.

Time Slider

Use the time slider beneath the network graphic to adjust the display of contributors and their collaborations by date. Only contributors who worked on events with first dates within the range will be displayed. Contributors whose collaborations on events with first dates outside the range are hidden.

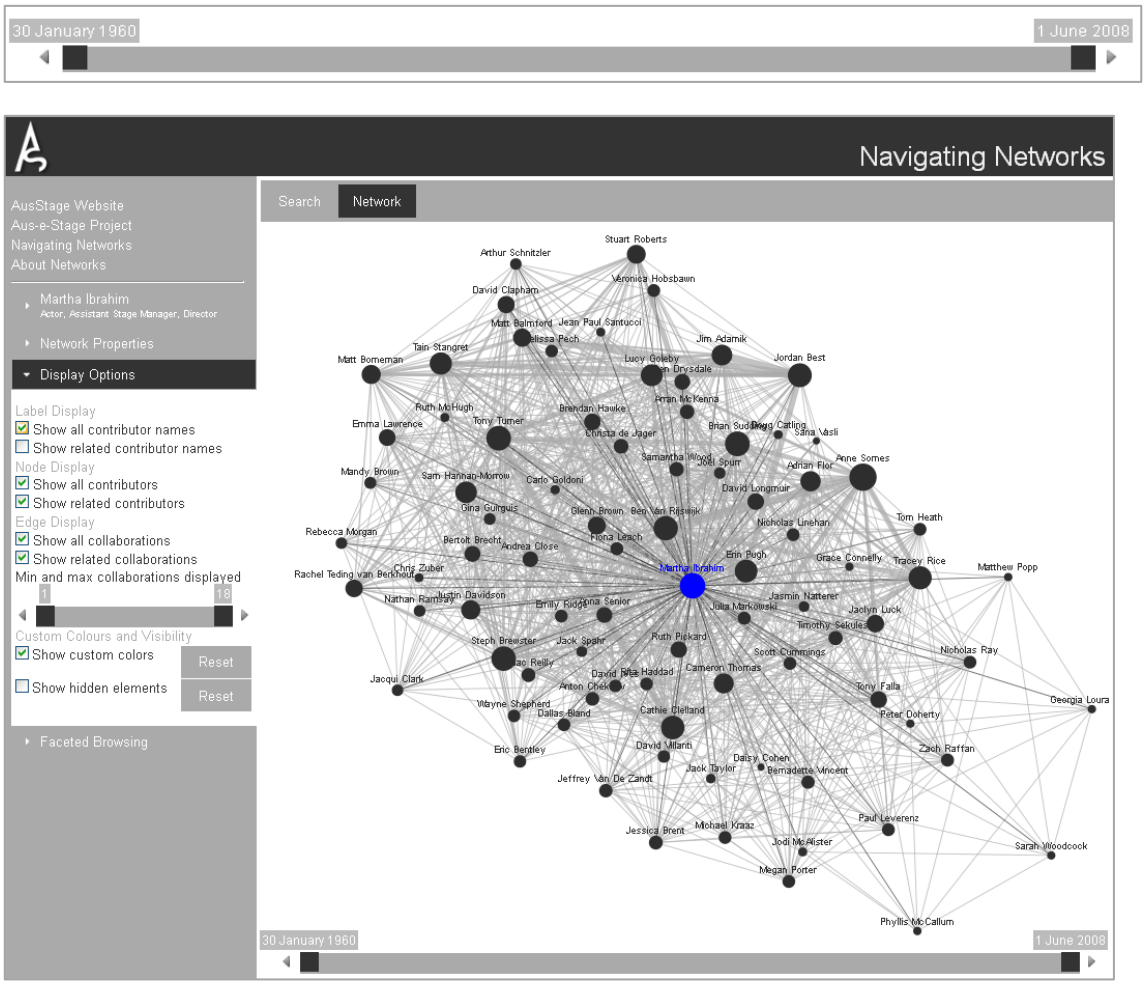


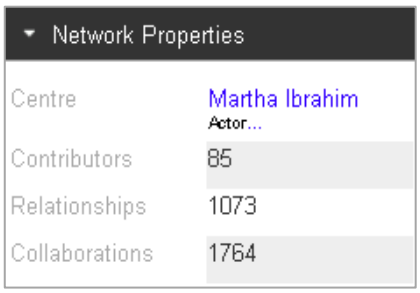
Figure 7: Network graphic with 'show all contributor names' display option selected

Save

Download the network in GraphML format for viewing in a network visualisation application such as Gephi or Visone. The file will include all information in the network, regardless of the current display options. Information on how to view exported graph data is provided later in this manual.

Network

View information about the contributor network under the Network tab in the sidebar.



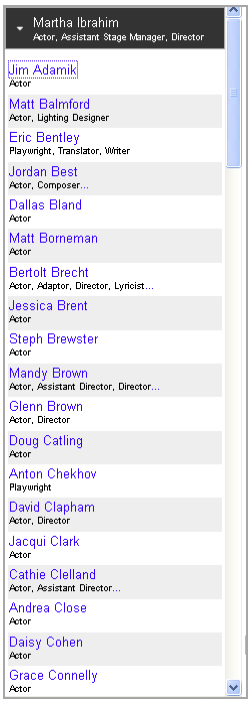
Centre: The contributor at the centre of the network. Click on the Centre button to select the contributor. Click on the contributor's name to link to the AusStage record.

Contributors: The number of contributors in the network including the central contributor. The central contributor's number of collaborators is this number minus one. For example, Martha Ibrahim has 85 - 1 = 84 collaborators.

Relationships: The number of relationships between contributors in this network. A relationship is counted just once, even when two contributors have collaborated on two or more events.

Collaborations: The number of collaborations between contributors in this network. A collaboration is counted each time two contributors have collaborated on an event.

Contributor Details



Information about a selected contributor is displayed in the sidebar.

Click on a contributor's node in the network graphic to view information about the contributor.

Click the triangle next to the contributor's name in the sidebar to view the list of collaborators.

Click on a contributor's name in the sidebar to link to the contributor's record in AusStage.

Relationship Details

Information about a selected relationship is also displayed in the sidebar

Click on a line between two contributors in the network graphic to view information about their collaborations.

Click on the triangle next to their names in the sidebar to view the events they have collaborated on.

Click on the contributors' names in the sidebar to link to their records in AusStage.

Facets

Use facets to highlight contributors in the network by artistic function, gender and nationality. Click on the Facets tab to browse these attributes. In facets mode, the background of the network graphic is coloured dark grey and selected nodes and lines are coloured white. Close the Facet tab to return to the regular mode.

Select the attributes you want to highlight within each facet. The attributes are dynamically generated from the contributors in the network. The selected attributes are summarised in the *Search Criteria* tab.

Show All Nodes: Check to display all nodes and relationships. Nodes matching those attributes are coloured blue. Uncheck to display only those nodes matching the selected attributes. All other nodes and their relationships are hidden.

Figure 8 demonstrates how facets can highlight Actors who are Female and Australian in the 'Martha Ibrahim' network.

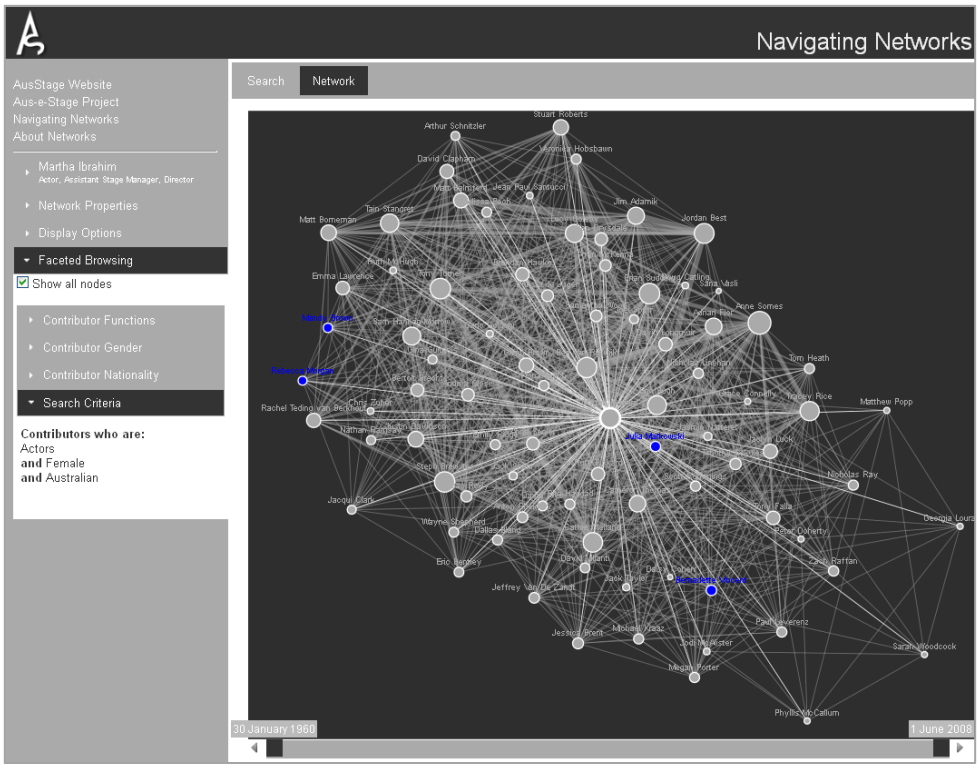


Figure 8: Network graphic in Facets mode

Navigating Networks: Event Networks

An event network is arranged chronologically to show the events that contributors are involved in before and after the central event. There are three types of event network, which reveal a progressively broader and more complex picture of who was collaborating on what around the central event.

- **First Degree** (default) retrieves a network that includes, for each contributor to the central event, their links to one event before and one event after the central event.

- **Second Degree Simple** retrieves a network that includes, for each contributor to the central event, their links to two events before and two events after the central event.

- **Second Degree Complex** retrieves a network which includes, for each contributor to the central event, their links to events before and after (first degree), and then, for each contributor to all those events, all their links to events before and after (second degree).

The difference between the two types of networks at the second degree is this: for the simple network, we only retrieve the events at the second degree if they involved contributors to the central event; for the complex network, we retrieve all events at the second degree which involve contributors from events at the first degree.

To view an event network:

1. Click the **+** icon to select an event. Your selected event is added beneath the search results. Only one event can be selected for an event network. You can click the **x** next to the event name to remove the event and make another selection.

2. Choose a network type from the drop-down menu. Choose either 1st Degree, 2nd Degree Simple or 2nd Degree Complex. 1st Degree is the default.

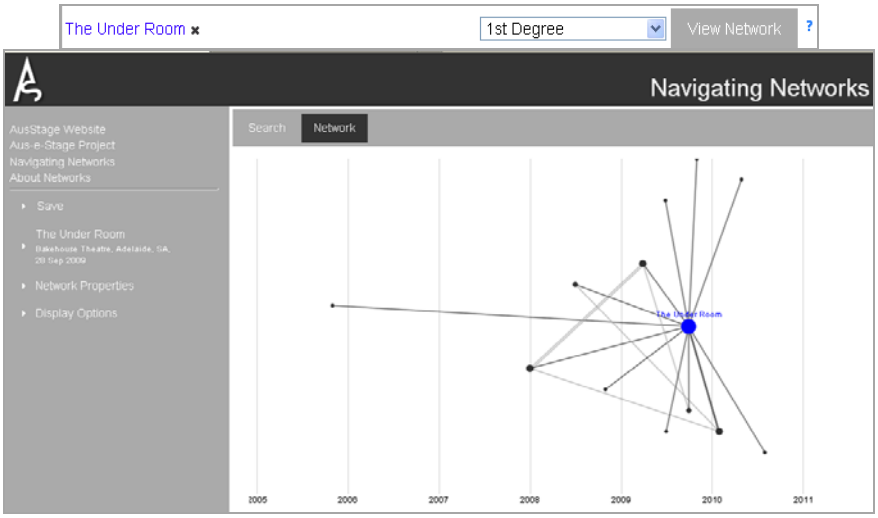
3. Click the View Network button to see the network.

Example Event Network

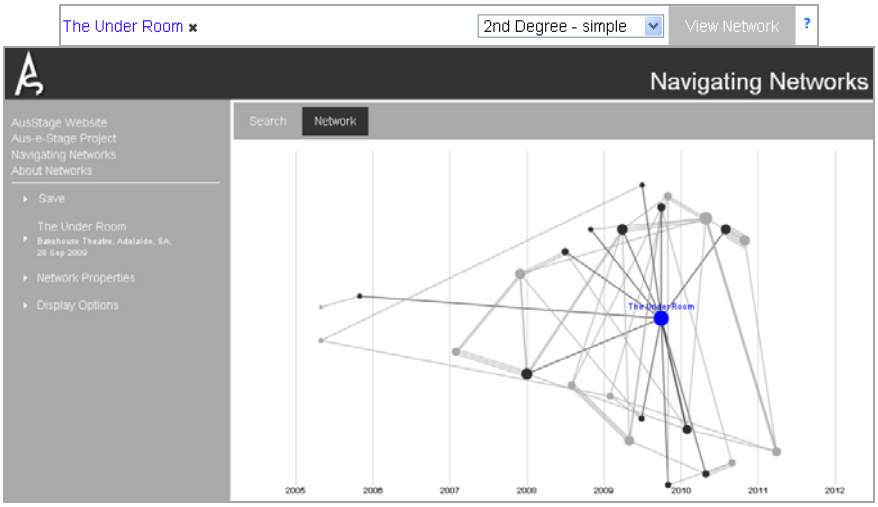
The event titled “The Under Room” held at the Bakehouse Theatre in Adelaide on 29 October 2009 is chosen as the central event for this example. Enclose "The Under Room" in double quotation marks when performing the search.

Figure9 illustrates the difference between First Degree, Second Degree Simple and Second Degree Complex network graphics.

First Degree Network



Second Degree Network – Simple



Second Degree Network – Complex

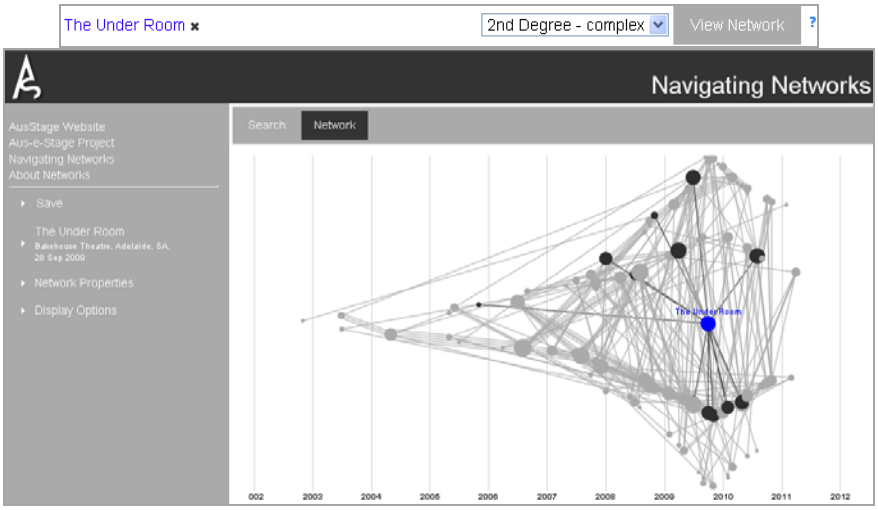


Figure 9: First, Second-Simple and Second-Complex Network graphics for "The Under Room"

Navigating Networks: Event Network Display

In an event network, events are represented as round nodes arranged chronologically by first date along a timeline. Contributors are represented as lines linking their events in chronological order. Larger nodes represent events with contributors linked to many other events in the network. Smaller nodes represent events with fewer contributors to other events.

Manipulate the network graphic using a mouse or trackpad. Reveal the names of events by hovering the pointer over nodes. Reveal the names of contributors by hovering the pointer over lines. Re-arrange the network layout by clicking and dragging nodes. Nodes may only be dragged up-and-down; the horizontal position represents the event's first date and this remains fixed to the timeline.

Click on an event to select it. The selected event is coloured blue. Events linked by contributors before and after the selected event are coloured dark grey. Other events not directly connected with contributors to the selected event are coloured light grey.

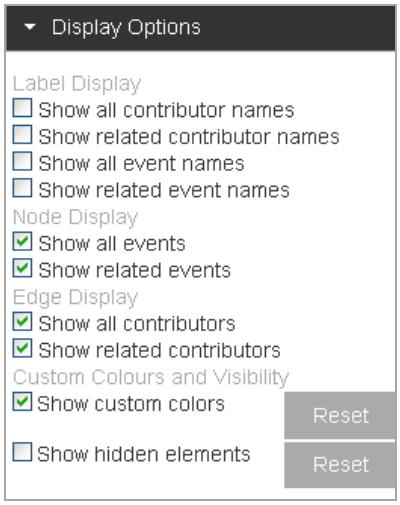
Click on a line to select a contributor's path through a series of events. The selected contributor is coloured blue. Only one event or contributor may be selected at a time.

Zoom in and out of the network by using the mouse scroll-wheel. Pan the whole network by clicking and dragging in space around the network.

Information about the network is displayed in the sidebar to the left. Controls for adjusting the display and saving the network are also provided.

Display

Change the way information is displayed in the network graphic by adjusting the options in the Display tab.



Label Display

Show all contributor names: Check to display the names of all contributors in the network. Uncheck to hide all contributor names (see Figure 10).

Show related contributor names: Check to display only the names of contributors who have collaborated with the selected contributor. *Show all contributor names* must be unchecked.

Show all event names: Check to display the names of all events in the network. Uncheck to hide all event names.

Show related event names: Check to display the names of events linked by contributors to the selected event. *Show all event names* must be unchecked.

Node Display

Show all events: Check to display the nodes of all events in the network. Uncheck to hide all event nodes.

Show related events: Check to display only the nodes of events linked by contributor to the selected event. *Show all events* must be unchecked.

Edge Display

Show all contributors: Check to display the lines of all contributors in the network. Uncheck to hide all contributors.

Show related contributors: Check to display only the lines of contributors to the selected event. *Show all contributors* must be unchecked.

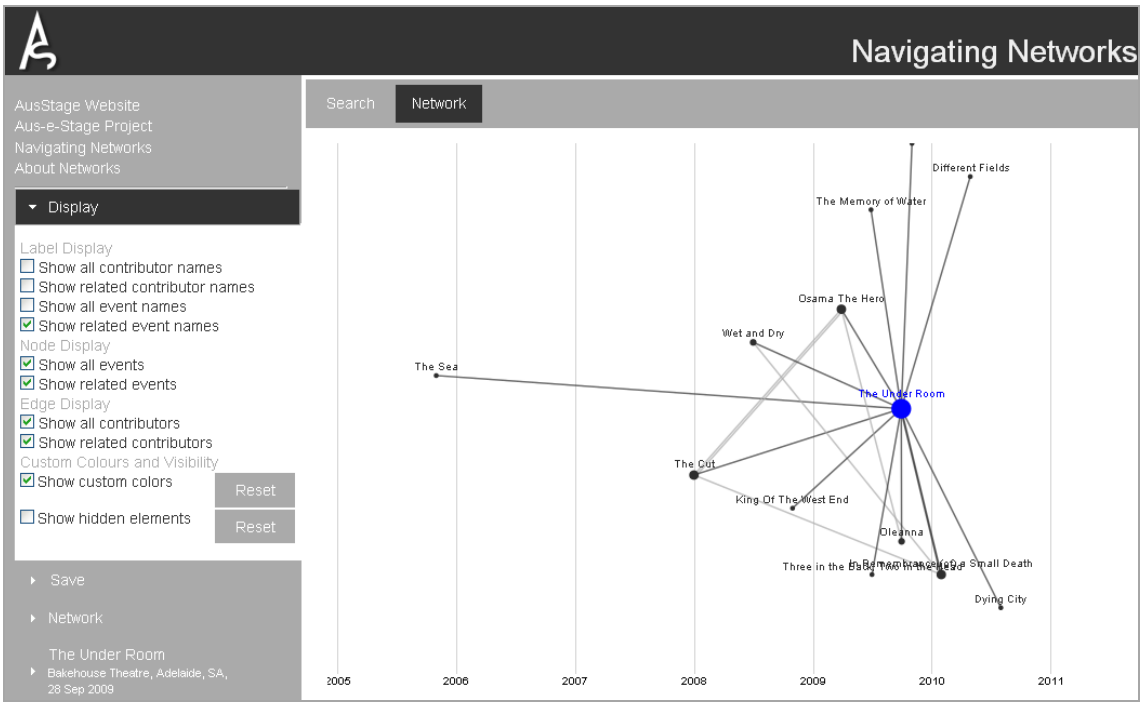


Figure 10: Network graphic with 'show related event names' display option selected

Custom Colours and Visibility

You can customise the display of individual nodes. Click on a node while holding down the ALT key (also called OPTION key on Mac). From the pop-up window you can: colour

the node by selecting from the palette, remove a custom colour you have previously applied, and temporarily hide the node and its lines.

You can adjust the display of custom colours and hidden elements from the sidebar.

Show Custom Colours: Check to display the custom colours applied to nodes. Uncheck to view the default colours of hide the custom colours, uncheck the box. To remove all custom colours permanently click the corresponding Reset button.

Show Hidden Elements: Check to see elements that are individually hidden. Uncheck to hide all elements that are individually hidden. You can also use the corresponding Reset button to remove all customized hiding of elements.

Save

Download the network in GraphML format for viewing in a network visualisation application such as Gephi or Visone. The file will include all information in the network, regardless of the current display options. Information on how to view exported graph data is provided later in this manual.

Network

View information about the event network under the Network tab in the sidebar.

Centre: The event at the centre of the network. Click on the Centre button to select the event. Click on the event name to link to the AusStage record.

Events: The number of events in the network, including the central event.

Contributors: The number of contributors in the network.

Event Details

Information about a selected event is displayed in the sidebar.

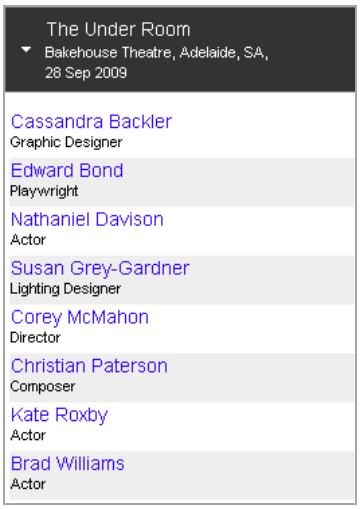
Click on an event's node in the network graphic to view information about the event.

Click on the triangle next to the event's name in the sidebar to view the list of contributors to that event.

Click on the event name in the sidebar to link to the event record in AusStage.

Click on a contributor's name in the sidebar to link to the contributor record in AusStage.

Contributor Details



Information about a selected contributor is displayed in the sidebar.

Click on a contributor's line in the network graphic to view information about the contributor.

Click on the triangle next to the contributor's name in the sidebar to view the contributor's list of events.

Click on the contributor's name in the sidebar to link to the contributor record in AusStage.

Click on an event name in the sidebar to link to the event record in AusStage.

Navigating Networks: Export Graph Data

Export graph data for use in stand-alone network visualisation and analysis applications, such as Visone and Gephi.

You can export graph data as you browse networks. You can also use the interface at http://beta.ausstage.edu.au/networks/export.jsp to export graph data (Figure 12).

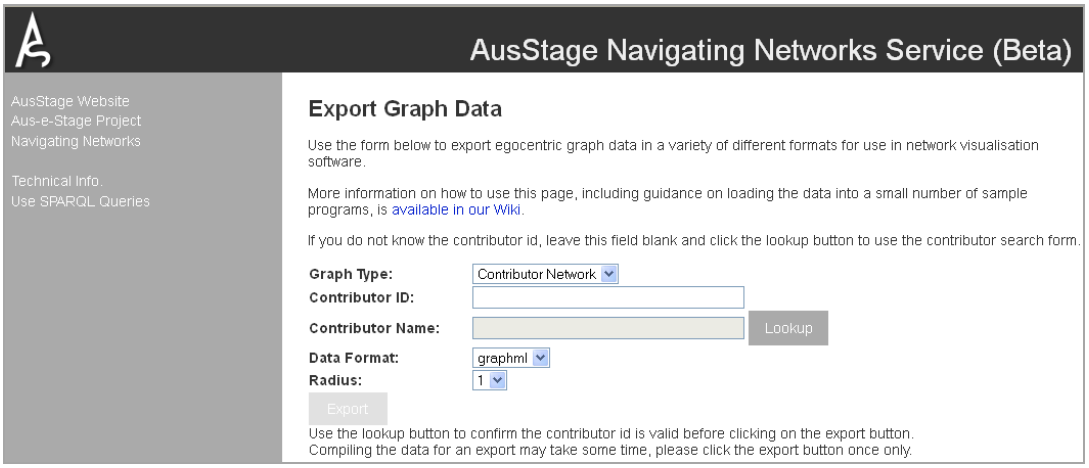


Figure12: Export Graph Data interface

Export Contributor Network

If you know the contributor identifier**:**

1. Enter the id in the *Contributor Id* field.
2. Click the *Lookup* button situated to the right of the *Contributor Name* field, this checks that the contributor id relates to a contributor and you should see the contributors name appear in the *Contributor Name* field.

If you don't know the contributor identifier:

1. Click on the *Lookup* button situated to the right of the *Contributor Name* field. A popup window appears with a single field for Contributor Name.
2. Enter the name of the contributor you wish to graph and click the *Search* button. After a few moments the window will show matching results.
3. Click the *Choose* button relating to the contributor you wish to graph. The popup window will disappear, and both the *Contributor Id* and *Contributor Name* fields will be populated.

After selecting your contributor:

1. Select the desired data format from the drop down list. The data format you choose should depend on the software you are using to visualize the graph. GraphML is compatible with Gephi and Visone.

2. Choose the desired radius of your graph. This relates to how many edges are between the central node (*the contributor*) and the outlying nodes at the edge of the network. For instance, a radius of 2 will give you a network of all the people your selected contributor has worked with, and all the people they have worked with.

3. Click the *Export* button and in a few moments the file will be downloaded to your computer. The file is named **ausstage-graph-*contributorId*-degrees-*numOfDegrees*.graphml** where *contributorId* is the contributor id you selected and *numOfDegrees* is the radius you selected.

Export Event Network

If you know the event identifier:

1. Enter the id in the *Event Id* field.

2. Click the *Lookup* button situated to the right of the *Event Name* field, this checks that the contributor id relates to a contributor and you should see the contributors name appear in the *Event Name* field.

If you don't know the event identifier:

1. Click on the *Lookup* button situated to the right of the *Event Name* field. A popup window appears with a single field for Event Name.

2. Enter the name of the event you wish to graph and click the *Search* button. After a few moments the window will show matching results.

3. Click the *Choose* button relating to the event you wish to graph. The popup window will disappear, and both the *Event Id* and *Event Name* fields will be populated.

After selecting your event:

1. Select the desired data format from the drop down list. The data format you choose should depend on the software you are using to visualize the graph. GraphML is compatible with Gephi and Visone.

2. Choose the desired radius of your graph. This relates to how many edges are between the central node (*the event*) and the outlying nodes at the edge of the network.

3. Choose Simplify *True* or *False*. For Simplify True, we only retrieve the events at the second degree if they involved contributors to the central event. For Simplify False, we retrieve all events at the second degree that involve contributors from events at the first degree.

4. Click the *Export* button and in a few moments the file will be downloaded to your computer. The file is named **Evt-eventId-D-radius-simplify.graphml** where *eventId* is the event id you selected, *radius* is the number of degrees you selected at radius, and simplify is either S for simplify (Simplify True) or C for complex (Simplify False).

Mac users

If you are using Chrome or Safari on a Mac computer to download the Network Data you will need to remove the .xml extension that is automatically added to the file by the browser. The best way to do this is to right-click on the file, and select *Get Info* from the popup menu. In the info window, scroll down to Name & Extension. Remove the .xml extension from the file name.

About GraphML

GraphML defines the topology of a graph by declaring its nodes and edges. In addition to this, application related information of simple type for the elements of the graph can be specified through the extension GraphML-Attributes (http://graphml.graphdrawing.org/primer/graphml-primer.html#Attributes). To look into the capability of the network analysis and visualization software (Network Workbench 1.0, Visone 2.6.2 and Gephi 0.7 beta) in regards to their support for GraphML format – attribute in particular, a simple actors' network in GraphML format is prepared and examined in the software mentioned above.

Actors' Network in GraphML Format

To illustrate the GraphML with attribute support, a sample GraphML described a simple actors' network with 3 nodes and 2 edges is prepared.

In this actors' network, actors are defined as nodes. The contributor ID is defined as node id. Each node has 3 attributes. They are **FirstName**, **LastName** and **Gender** respectively. Edge is defined from source node to target node. It represents the events two actors have worked on. Each edge has 2 attributes. They are **NumOfEvents** which represents edge weight and **DateRange**.

Details are reflected in the sample in

Figure 13.

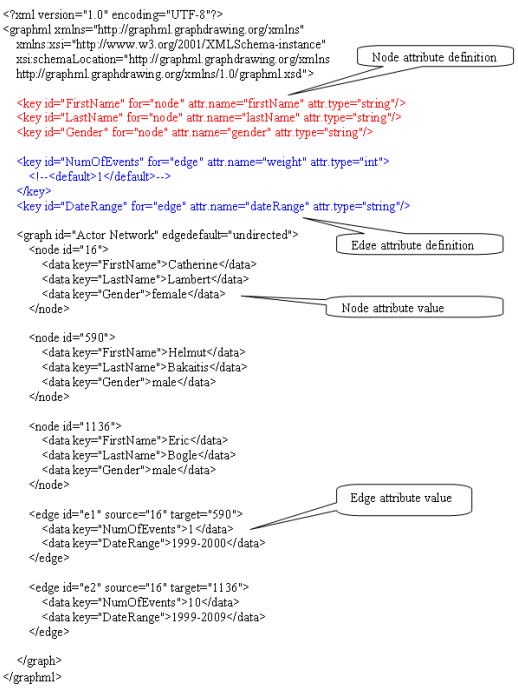


Figure 13: Sample GraphML output

Graph Visualisation Programs

Before you can view any of the exported data, you will need to download and install one of the following graph visualisation programs.

- Gephi: Open-source network visualization software. http://gephi.org/users/download/
- Visone: Java based network visualization software. The Visone web starter is the recommended way to run Visone. Each time you run the web starter, it will check for updates and install them before running Visone. http://visone.info/

Using the Graph Data

Gephi

The following guide assumes you have completed the following:

1. Downloaded and Installed Gephi
2. Used the Export Graph Data page to download a set of network data in .graphml format.
3. If you are not already familiar with Gephi, it is advised you work through some of the tutorials available in order to get the most out of visualizing your network data.

The following steps will guide you through loading your network data into Gephi.

1. Locate and run Gephi on your computer.
2. A dialogue box will appear offering you the following options

- Open Recent
- New Project
- Samples

3. Select *Open Graph File* under the *New Project* heading
4. Another dialogue box will appear titled *Open*. Change the File Format to *GraphML Files (*.graphml)*.
5. Using the *Open* dialogue box, locate and select the .graphml file you wish to visualize. Then click the *Open* button.
6. Another dialogue box will appear titled *Import report*. Click the *OK* button
7. Your network data should now be displayed within Gephi as a visualisation.

Adding two networks to the same visualisation

Once you have imported one set of data into the visualisation you may wish to add another data set to the visualisation. This can be done very simply using the following steps.

1. With your current project in Gephi displayed, go to the File Menu and select *Open*
2. Locate the other .graphml file you wish to model.
3. Click *Open*.
4. The *Import report* dialogue box will appear.
5. In the bottom right hand corner of this box will be two options
   - Add full graph
   - Append graph
6. Ensure *Append graph* is selected.
7. Click *OK*
8. The additional data should now be displayed in the visualisation.

Visone

The following guide assumes you have completed the following:

1. Downloaded and run the Visone Java Web Starter
2. Used the Export Graph Data page to download a set of network data in .graphml format.

3. If you are not already familiar with Visone, it is advised you read through the documentation available in order to get the most out of visualizing your network data.

The following steps will guide you through loading your network data into Visone

1. Locate and run visone.jnlp on your computer.

    - Depending on your operating system, you may get a message similar to the following: *The application "Visone" from "visone.info" is requesting access to your computer. The digital signature could not be verified.*

    If this occurs, check the box that will allow this in future and click the *Allow* button

2. Once Visone has loaded, go to the *File* menu and select *Open*.

3. The *Open* dialogue box will appear. Use this to locate and select the .graphml file you wish to visualize.

4. Click the *OK* button in the *Open* dialogue box.

5. Your network data will then be loaded into Visone as a visualisation.

Please Note: Visone initially loads this data very simply, so you may on first load see just one coloured box. Using the visualization and layout parameters within Visone will alter the visualisation.

Adding two networks to the same visualisation

Once you have imported one set of data into the visualisation you may wish to add another data set to the visualisation. This can be done very simply using the following steps.

1. With your current project in Visone displayed, go to the File Menu, select *Open*

2. Locate the other .graphml file you wish to model.

3. Click *Open*.

4. You will see Visone has created a separate visualization.

5. Go to the *Edit* menu and select *Select All*

6. Also in the *Edit* menu select *Copy*

7. Return to your original visualization by clicking it's title listed above the visualization window.

8. Go to the *Edit* menu and select *Paste*.

9. Both networks are now in the same visualization space for manipulation.

Basic Search API

The basic search API allows for searches to be undertaken of the dataset it is used primarily to provide search capabilities via AJAX for other parts of the Navigating Networks Service such as the Graph Export page.

Base URL

The base URL for the Lookup API is http://beta.ausstage.edu.au/networks/search?

Request Type

Get Request

Available Parameters

Name	Possible Values	Optional	Default
task	collaborator	No	
query	search terms	No	
sort	name	Yes	name
format	json	Yes	json
limit	integer between 5 and 25	Yes	5
callback	function name to use for a JSONP request	Yes	

Parameter Definitions

Task: collaborator

Undertake a collaborator search

Query

A list of search terms. Currently the search is a case insensitive substring match using the collaborator name

Sort: name

Sort the search results in name order

Format: json

Format the search result as a JSON array

Limit: the number of results to return

A maximum limit of 25 is imposed by the API as a way to reduce resource consumption and to reinforce that the search API is designed to be supplementary to other discovery mechanisms that will be made available in the future.

Callback: the name of the callback function

When data is requested using the JSON format the callback parameter specifies the function name to use for a JSONP request.

Sample Output


```
[{
 "id":414726,
 "functions":["Properties Master"],
 "name":"Anni Archer",
 "familyName":"Archer",
 "collaborations":1,
 "givenName":"Anni",
 "url":"http:\/\/www.ausstage.edu.au\/indexdrilldown.jsp?xcid=59&f_contrib_id=414726"
 },
 {
 "id":253687,
 "functions":["Actor"],
 "name":"Brett Archer",
 "familyName":"Archer",
 "collaborations":3,
 "givenName":"Brett",
 "url":"http:\/\/www.ausstage.edu.au\/indexdrilldown.jsp?xcid=59&f_contrib_id=253687"
 }
]
```


Protovis API

The Protovis API provides the functionality export data in a format that can be used with the Protovis visualisation library.

The details of the API are as follows:

Base URL

The base URL for the Lookup API is http://beta.ausstage.edu.au/networks/protovis?

Combining this URL with the parameters outlines below retrieves data from the Navigating Networks Dataset.

Available Parameters

Name	Possible Values	Optional	Default
task	ego-centric-network / event-centric-network	No	
id	unique contributor id / event id	No	

radius	Integer between 1 and 3	Yes	1
simplify	Boolean	Yes	true
callback	function name to use for a JSONP request	Yes	

task

The task parameter defines the type of export that is undertaken. Currently two tasks are available. They are ego-centric network and event-centric-network.

id

The id parameter defines the unique identifier of the contributor or event that is of interest.

radius

The desired number of edges between the central node and the peripheral nodes of the network.

simplify

This parameter is only valid with event to event 2nd degree network (task = event-centric-network && radius = 2)

simplify = true : with each of the 1st degree nodes, only events for those contributors involved in the central node are retrieved.

simplify = false: with each of the 1st degree nodes, events for all contributors are retrieved.

callback

When data is requested using the JSON format the callback parameter specifies the function name to use for a JSONP request.

Sample Output

The following is abbreviated sample output in response to the following API call:

http://beta.ausstage.edu.au/networks/protovis?task=ego-centric-network&id=414321


```
{
  "edges": [
    {
      "firstDate": "1989-07-27",
      "source": 1,
      "target": 7,
      "lastDate": "2001-11-04",
      "value": 14
    },
    {
      "firstDate": "2001-10-21",
      "source": 1,
```

```
    "target": 16,
    "lastDate": "2008-05-24",
    "value": 2
   },
   {
    "firstDate": "2005-07-18",
    "source": 1,
    "target": 19,
    "lastDate": "2005-07-20",
    "value": 1
   },
   {
    "firstDate": "2000-03-02",
    "source": 1,
    "target": 20,
    "lastDate": "2000-03-02",
    "value": 1
   },
   ...
   {
    "firstDate": "2010-08-05",
    "source": 114,
    "target": 115,
    "lastDate": "2010-08-21",
    "value": 1
   }
  ],
  "nodes": [
   {
    "id": "414321",
    "functions": [
     "Actor"
    ],
    "nodeUrl": "http:\/\/www.ausstage.edu.au\/indexdrilldown.jsp?xcid=59&amp;f_contrib_id=414321",
    "nodeName": "Brad Williams"
   },
   {
    "id": "533",
    "functions": [
     "Director",
     "Set designer",
     "Designer",
     "Costume Designer"
    ],
    "nodeUrl": "http:\/\/www.ausstage.edu.au\/indexdrilldown.jsp?xcid=59&amp;f_contrib_id=533",
    "nodeName": "Tim Maddock"
   },
   {
    "id": "611",
    "functions": [
     "Playwright",
     "Director",
     "Assistant Director"
    ],
    "nodeUrl": "http:\/\/www.ausstage.edu.au\/indexdrilldown.jsp?xcid=59&amp;f_contrib_id=611",
    "nodeName": "Cath McKinnon"
   },
   ...
   {
    "id": "440145",
    "functions": [

    ],
    "nodeUrl": "http:\/\/www.ausstage.edu.au\/indexdrilldown.jsp?xcid=59&amp;f_contrib_id=440145",
    "nodeName": "Bevan Emmett"
   }
```

```
 ]
}
```

Export API

The export API provides the functionality to export data out of the Navigating Networks Dataset in a variety of different formats.

The details of the API are as follows:

Graph Export

Base URL

The base URL for the Lookup API is http://beta.ausstage.edu.au/networks/export?

Combining this URL with the parameters outlines below retrieves data from the Navigating Networks Dataset.

Request Type

Get Request

Available Parameters

Name	Possible Values	Optional	Default
task	ego-centric-network-simple	No	
id	unique identifier of a contributor	No	
format	graphml, debug	Yes	graphml
radius	Integer between 1 and 3	Yes	1

Parameter Definitions

Task: ego-centric-network-simple

An ego centric network that has basic information included the central point of the network is the contributor with the supplied id.

Format: graphml

This export format uses the GraphML data format and includes edges and nodes.

Format: debug

This export format provides a text based representation of the internal data structures used by the service while compiling the graph. The format is as follows:

id – list of collaborators – number of collaborators in the list

For example:

111 – 101, 102, 1324, 56789 – 4

Radius

The desired number of edges between the central node and the peripheral nodes of the network

Sample Output

Graphml Format

```
<?xml version="1.0" encoding="utf-8" standalone="no"?>
<graphml xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://graphml.graphdrawing.org/xmlns
http://graphml.graphdrawing.org/xmlns/1.0/graphml.xsd"
  xmlns="http://graphml.graphdrawing.org/xmlns">
  <!--Graph generated on: ... -->
  <!--Graph generated by: ... -->
  <graph edgedefault="directed" id="ausstage-graph">
    <node id="2"/>
    <node id="10141"/>
    <edge source="2" target="10141"/>
    <node id="1021"/>
    <edge source="2" target="1021"/>
    <node id="10222"/>
    <edge source="2" target="10222"/>
    <node id="105"/>
    <edge source="2" target="105"/>
    <node id="110"/>
    <edge source="2" target="110"/>
    <node id="133"/>
    <edge source="2" target="133"/>
    <node id="1340"/>
    <edge source="2" target="1340"/>
    <node id="1352"/>
    <edge source="2" target="1352"/>
    <node id="1356"/>
    <edge source="2" target="1356"/>
    ...
      <edge source="415544" target="415995"/>
    <edge source="415993" target="415995"/>
    <edge source="425776" target="425777"/>
    <edge source="427679" target="430163"/>
    <edge source="430163" target="430713"/>
    <edge source="430163" target="431299"/>
    <edge source="430713" target="431299"/>
    <edge source="430918" target="440026"/>
    <edge source="430918" target="440027"/>
    <edge source="432105" target="432106"/>
    <edge source="432444" target="432445"/>
    <edge source="432444" target="432446"/>
    <edge source="432445" target="432446"/>
    <edge source="440026" target="440027"/>
  </graph>
</graphml>
```

Edge List Export

Note, that this export format exports the entire list of relationships in the dataset. This results in a large file that may take some time to process and download. It is highly recommended that this API be used sparingly and be used on a fast broadband connection.

Alternative static snapshots of this data may be downloaded from the downloads section of this website. These static snapshots are only updated on request.

Base URL

The base URL for the Lookup API is http://beta.ausstage.edu.au/networks/export?

Request Type

Get Request

Available Parameters

Name	Possible Values	Optional	Default
task	full-edge-list-with-dups, full-edge-list-no-dups, full-edge-list-with-dups-id-only, full-edge-list-no-dups-id-only actor-edge-list-with-dups, actor-edge-list-no-dups, actor-edge-list-with-dups-id-only, actor-edge-list-no-dups-id-only	No	

Parameter Definitions

Task: full-edge-list-with-dups

A full export of the dataset in the edge list format containing duplicate relationships.

Task: full-edge-list-no-dups

A full export of the dataset in the edge list format that does not contain duplicate relationships.

Task: full-edge-list-with-dups-id-only

A full export of the dataset in the edge list format that contains ids only.

Task: full-edge-list-no-dups-id-only

A full export of the dataset in the edge list format that does not contain duplicate relationships and that contains ids only.

Task: actor-edge-list-with-dups

An export of the dataset in the edge list format containing duplicate relationships between contributors with a function of "actor" or "actor and singer".

Task: actor-edge-list-no-dups

An export of the dataset in the edge list format that does not contain duplicate relationships between contributors with a function of "actor" or "actor and singer".

Task: actor-edge-list-with-dups-id-only

An export of the dataset in the edge list format that contains ids only between contributors with a function of "actor" or "actor and singer".

Task: actor-edge-list-no-dups-id-only

An export of the dataset in the edge list format that does not contain duplicate relationships and that contains ids only between contributors with a function of "actor" or "actor and singer".

Sample Output

Full edge lists

id \t given_name \t family_name \t id \t given_name \t family_name \n

Full edge lists (id only)

id \t id \n

Actor edge lists

id \t given_name \t family_name \t gender \t id \t given_name \t family_name \t gender \n

Actor edge lists (id only)

id \t id \nnn