

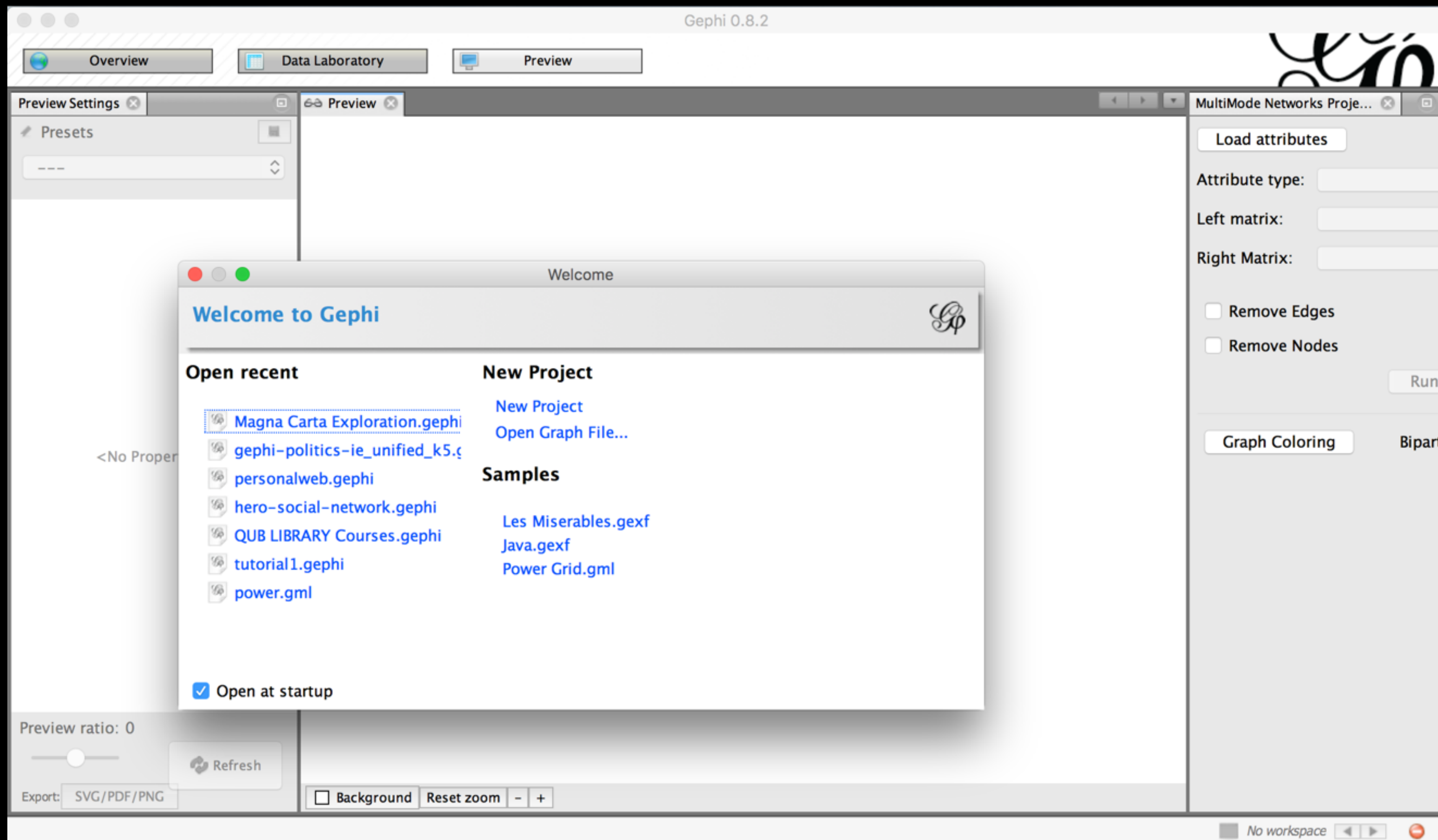
Introducing Gephi

Another Tool (Weapon) for your Arsenal

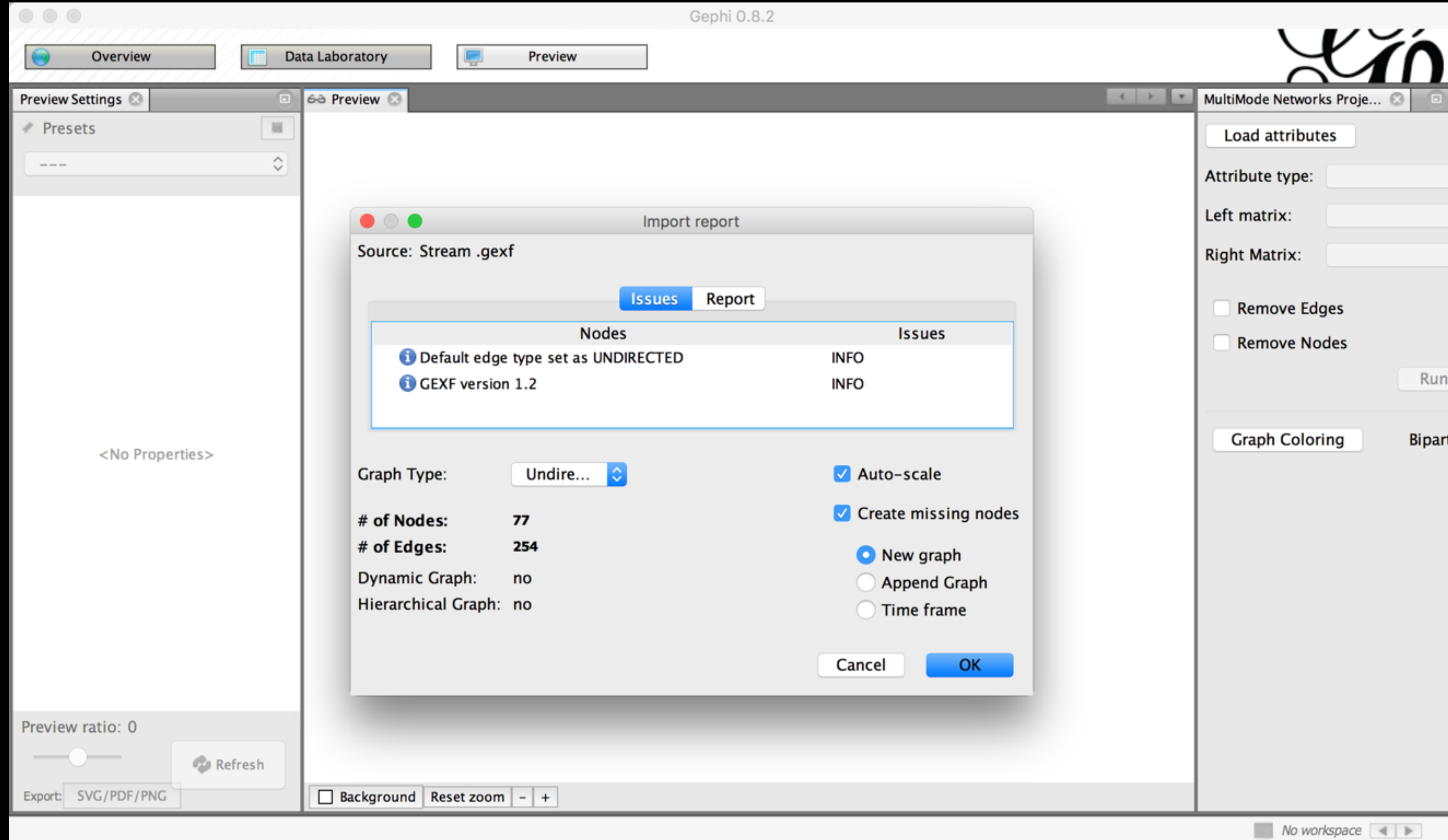
Steps

1. Make Sure Gephi Installed
2. Run and Load 'Les Miserables' sample dataset
3. View default visualisation
4. View Data
5. Calculate a Few Stats
6. View Preview
7. Export Graph
8. Try Different Algorithm
9. Preview Results
10. Ask Questions of the Graph and Stats

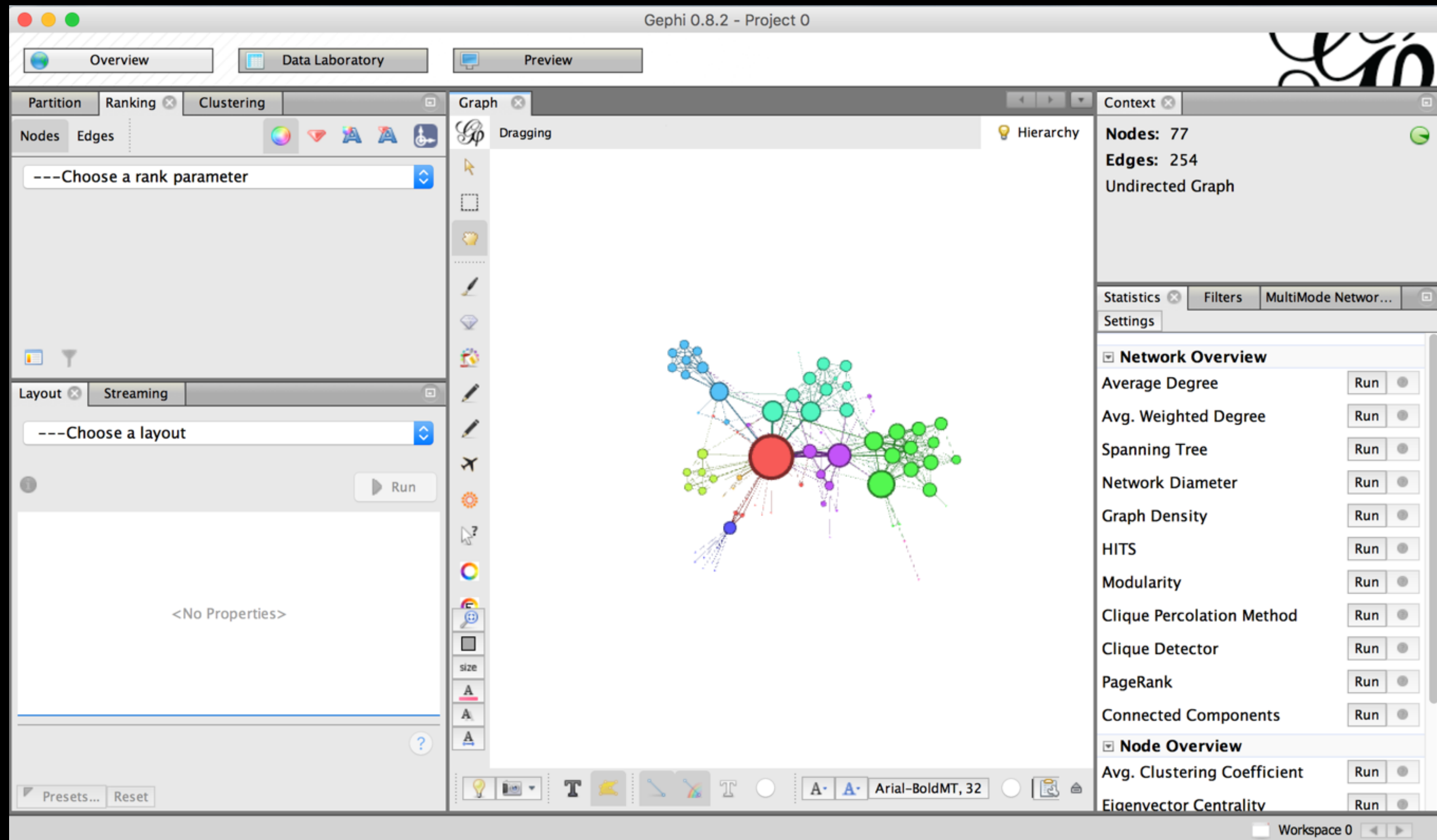
Step 1 - Install and Launch Gephi



Step 2 - Open Sample File



Step 3 - A Network Graph!



Step 4 - Inspect Node Data

Gephi 0.8.2 - Project 0

Overview Data Laboratory Preview

Data Table Statistics Partition

Nodes Edges Configuration Add node Add edge Search/Replace Import Spreadsheet Export table More actions Filter: Nodes

Nodes	Id	Label	Modularity Class
Myriel	0	Myriel	0
Napoleon	1	Napoleon	0
MlleBaptistine	2	MlleBaptistine	1
MmeMagloire	3	MmeMagloire	1
CountessDeLo	4	CountessDeLo	0
Geborand	5	Geborand	0
Champtercier	6	Champtercier	0
Cravatte	7	Cravatte	0
Count	8	Count	0
OldMan	9	OldMan	0
Labarre	10	Labarre	1
Valjean	11	Valjean	1
Marguerite	12	Marguerite	1
MmeDeR	13	MmeDeR	1
Isabeau	14	Isabeau	1
Gervais	15	Gervais	1
Tholomyes	16	Tholomyes	2
Listolier	17	Listolier	2
Fameuil	18	Fameuil	2
Blacheville	19	Blacheville	2

Add column Merge columns Delete column Clear column Copy data to other column Fill column with a value Duplicate column Create a boolean column from regex match Create column with list of regex matching groups

Workspace 0

Step 5 - Inspect Edge Data

Gephi 0.8.2 - Project 0

Overview Data Laboratory Preview

Data Table Statistics Partition

Nodes Edges Configuration Add node Add edge Search/Replace Import Spreadsheet Export table More actions Filter: Source

Source	Target	Type	Id	Label	Weight
1	0	Undirected	0		1
2	0	Undirected	1		8
3	0	Undirected	2		10
3	2	Undirected	3		6
4	0	Undirected	4		1
5	0	Undirected	5		1
6	0	Undirected	6		1
7	0	Undirected	7		1
8	0	Undirected	8		2
9	0	Undirected	9		1
11	0	Undirected	13		5
11	2	Undirected	12		3
11	3	Undirected	11		3
11	10	Undirected	10		1
12	11	Undirected	14		1
13	11	Undirected	15		1
14	11	Undirected	16		1
15	11	Undirected	17		1
17	16	Undirected	18		4
18	16	Undirected	19		4
18	17	Undirected	20		4
19	16	Undirected	21		4
19	17	Undirected	22		4
19	18	Undirected	23		4

Add column Merge columns Delete column Clear column Copy data to other column Fill column with a value Duplicate column Create a boolean column from regex match Create column with list of regex matching groups

Workspace 0

Step 6 - Summary Stats

Gephi 0.8.2 - Project 0

Overview Data Laboratory Preview

Data Table x Statistics x Partition x

Settings

☒ **Network Overview**

Average Degree Run ●

Avg. Weighted Degree Run ●

Spanning Tree Run ●

Network Diameter Run ●

Graph Density Run ●

HITS Run ●

Modularity Run ●

Clique Percolation Method Run ●

Clique Detector Run ●

PageRank Run ●

Connected Components Run ●

☒ **Node Overview**

Avg. Clustering Coefficient Run ●

Eigenvector Centrality Run ●

Lineage Run ●

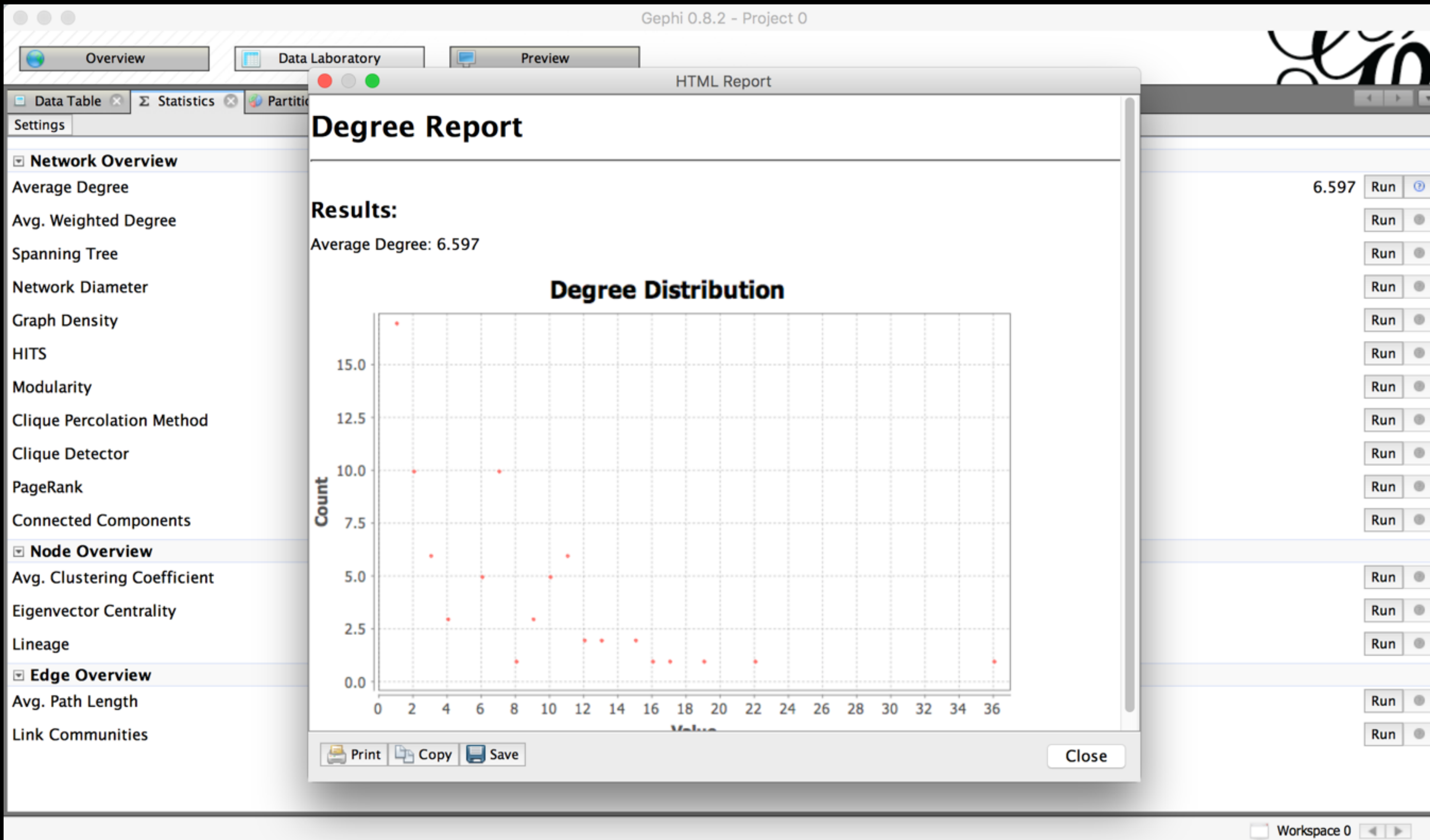
☒ **Edge Overview**

Avg. Path Length Run ●

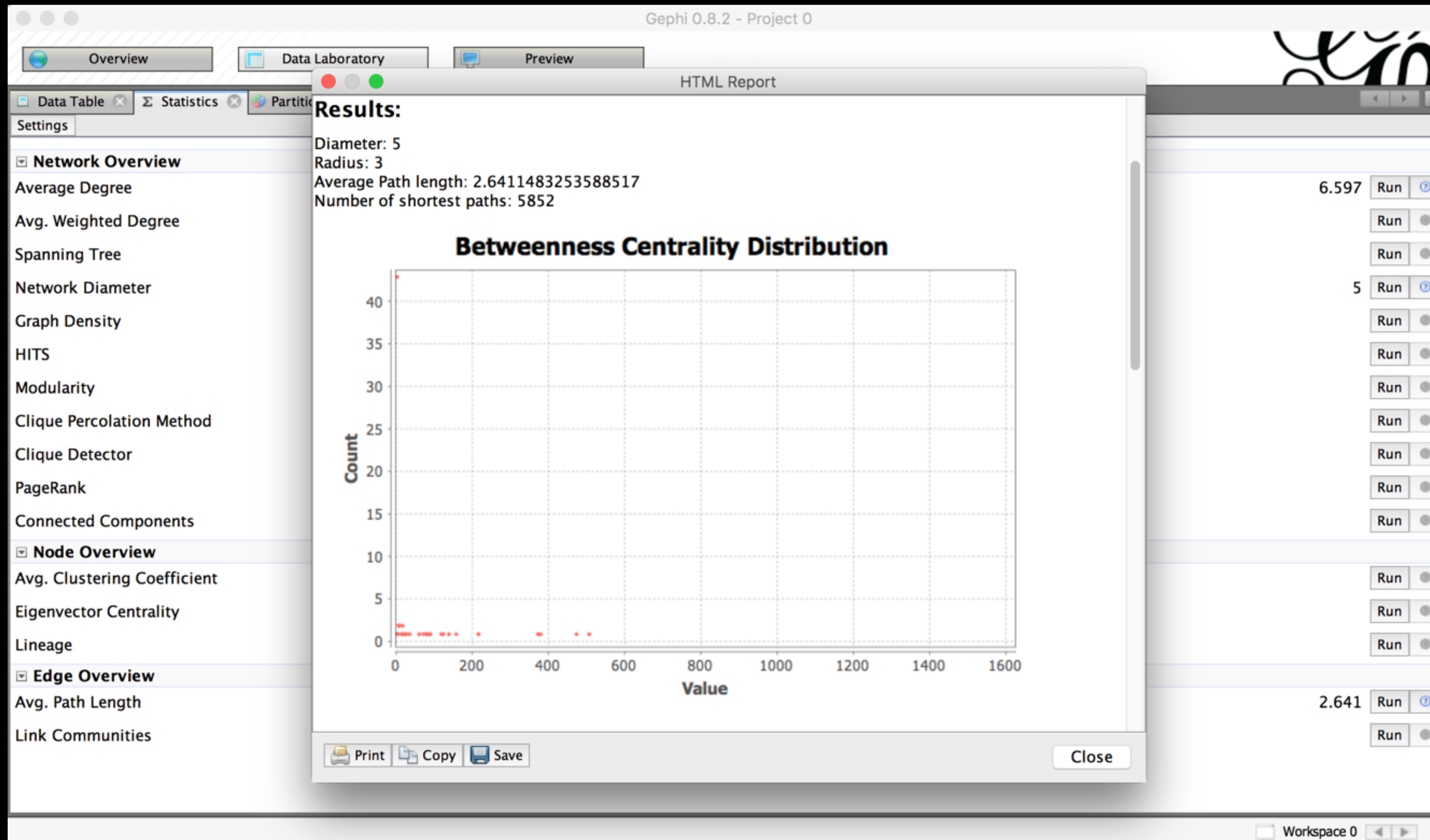
Link Communities Run ●

Workspace 0

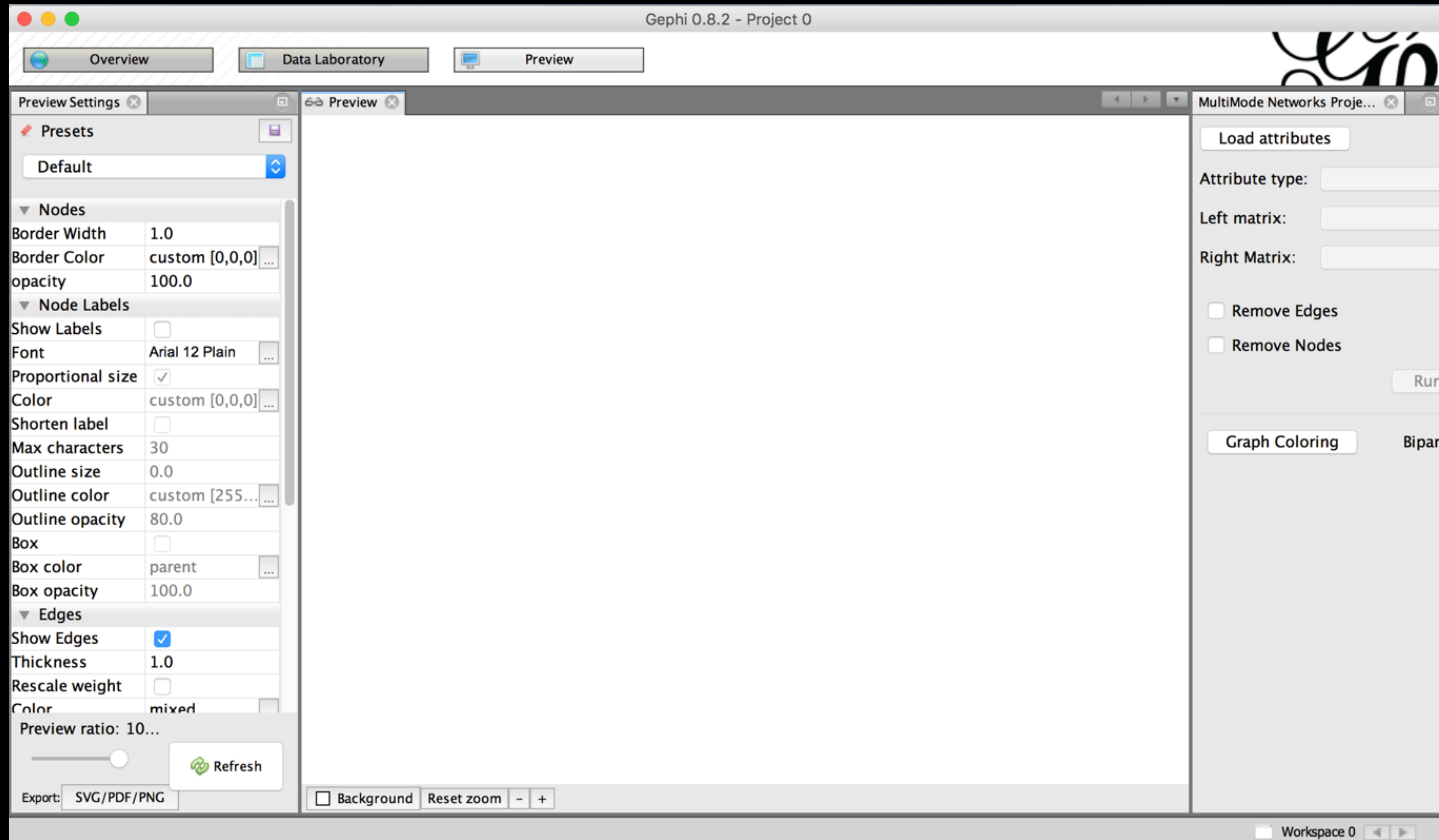
Step 7 - Whose Connected?



Step 8 - Someone is Important



Step 9 - Preview Your Graph



Step 10 - Preview Your Graph

Gephi 0.8.2 - Project 0

Overview Data Laboratory Preview

Preview Settings

Presets

Default

Nodes

Border Width: 1.0

Border Color: custom [0,0,0]

opacity: 100.0

Node Labels

Show Labels: ☐

Font: Arial 12 Plain

Proportional size: ☒

Color: custom [0,0,0]

Shorten label: ☐

Max characters: 30

Outline size: 0.0

Outline color: custom [255,0,0]

Outline opacity: 80.0

Box: ☐

Box color: parent

Box opacity: 100.0

Edges

Show Edges: ☒

Thickness: 1.0

Rescale weight: ☐

Color: mixed

Preview ratio: 10...

Refresh

Export: SVG/PDF/PNG

Background Reset zoom - +

MultiMode Networks Proje...

Load attributes

Attribute type:

Left matrix:

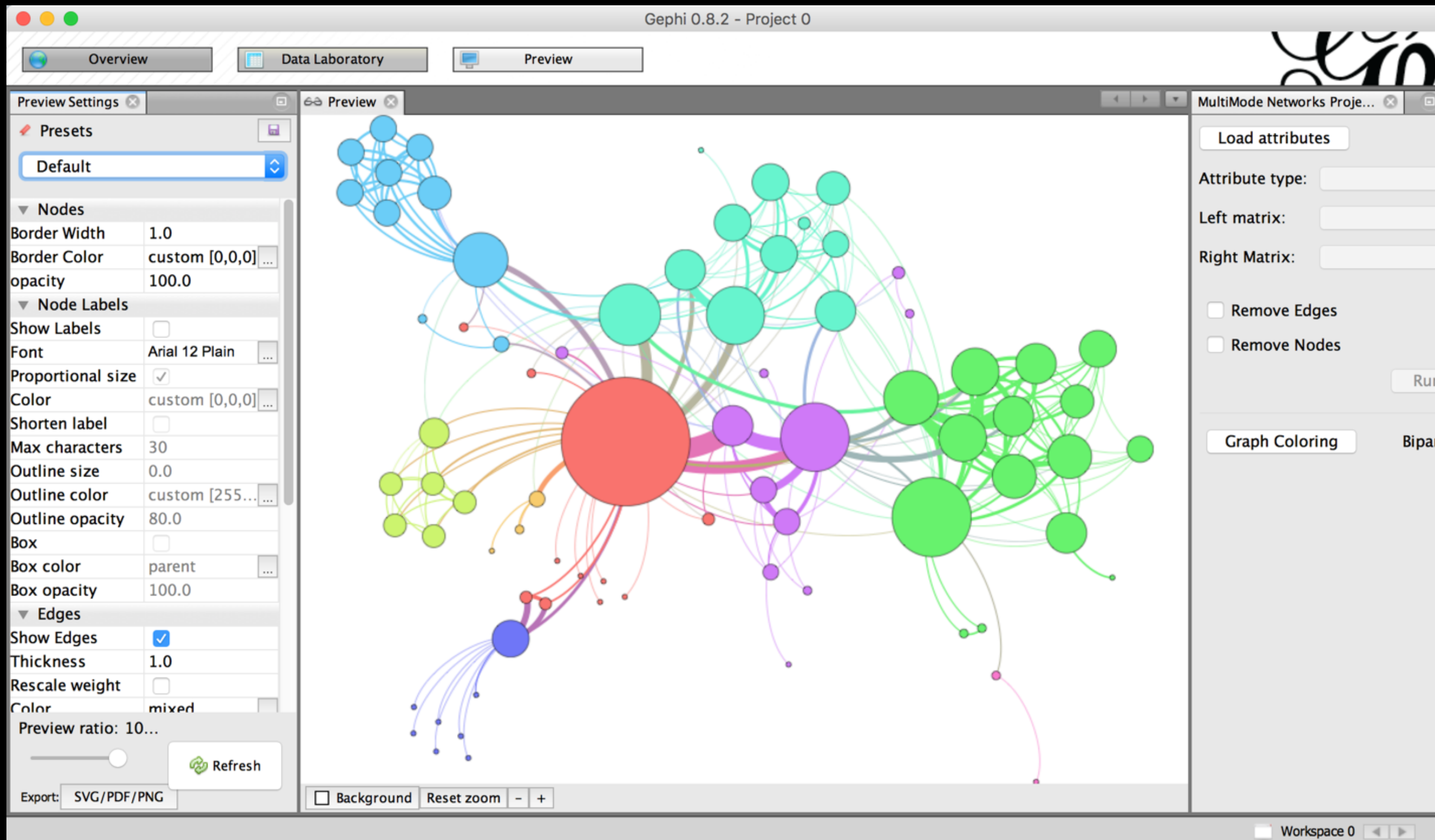
Right Matrix:

☐ Remove Edges

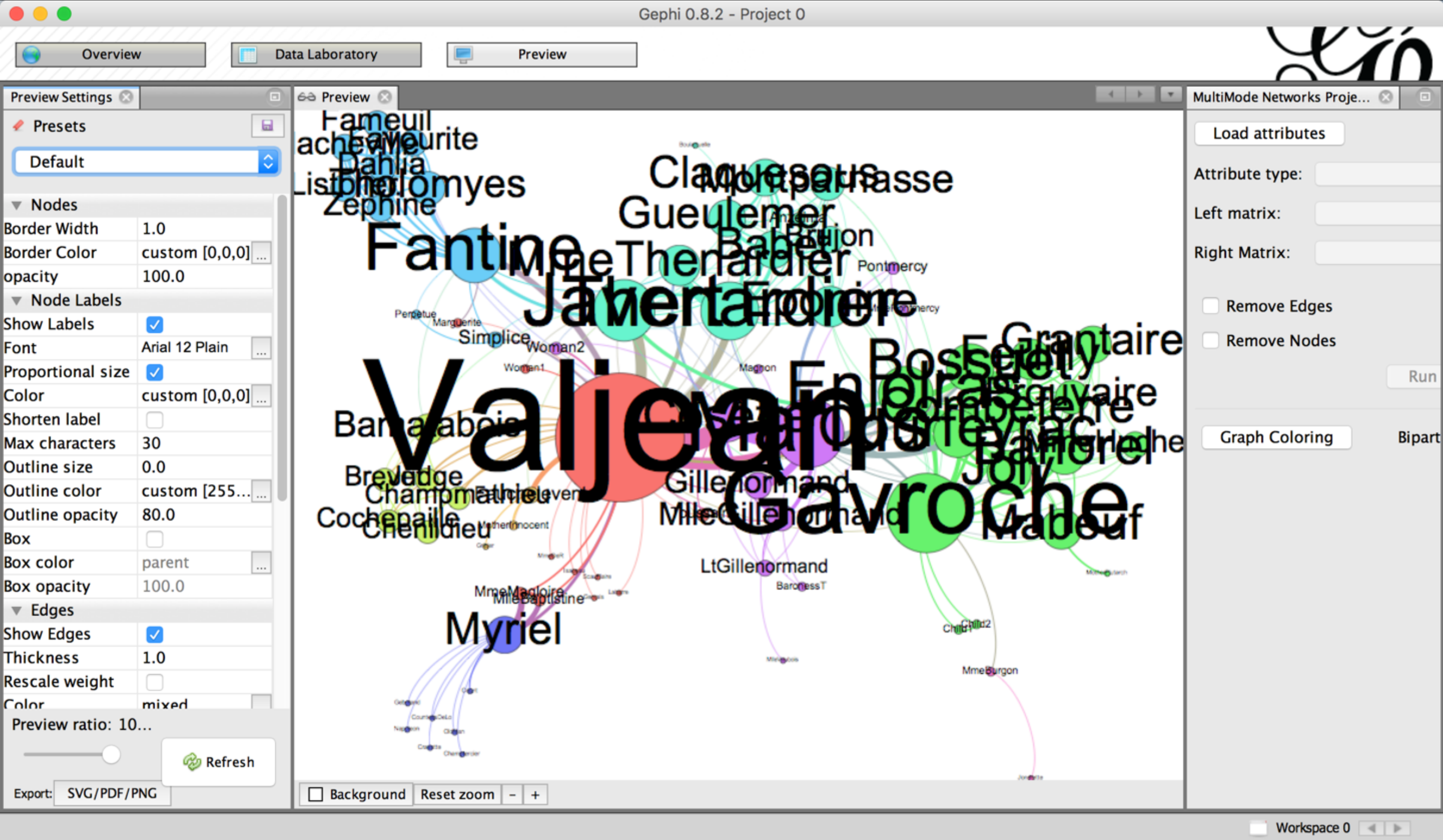
☐ Remove Nodes

Run

Graph Coloring Bipart



Step 11 - Add Labels



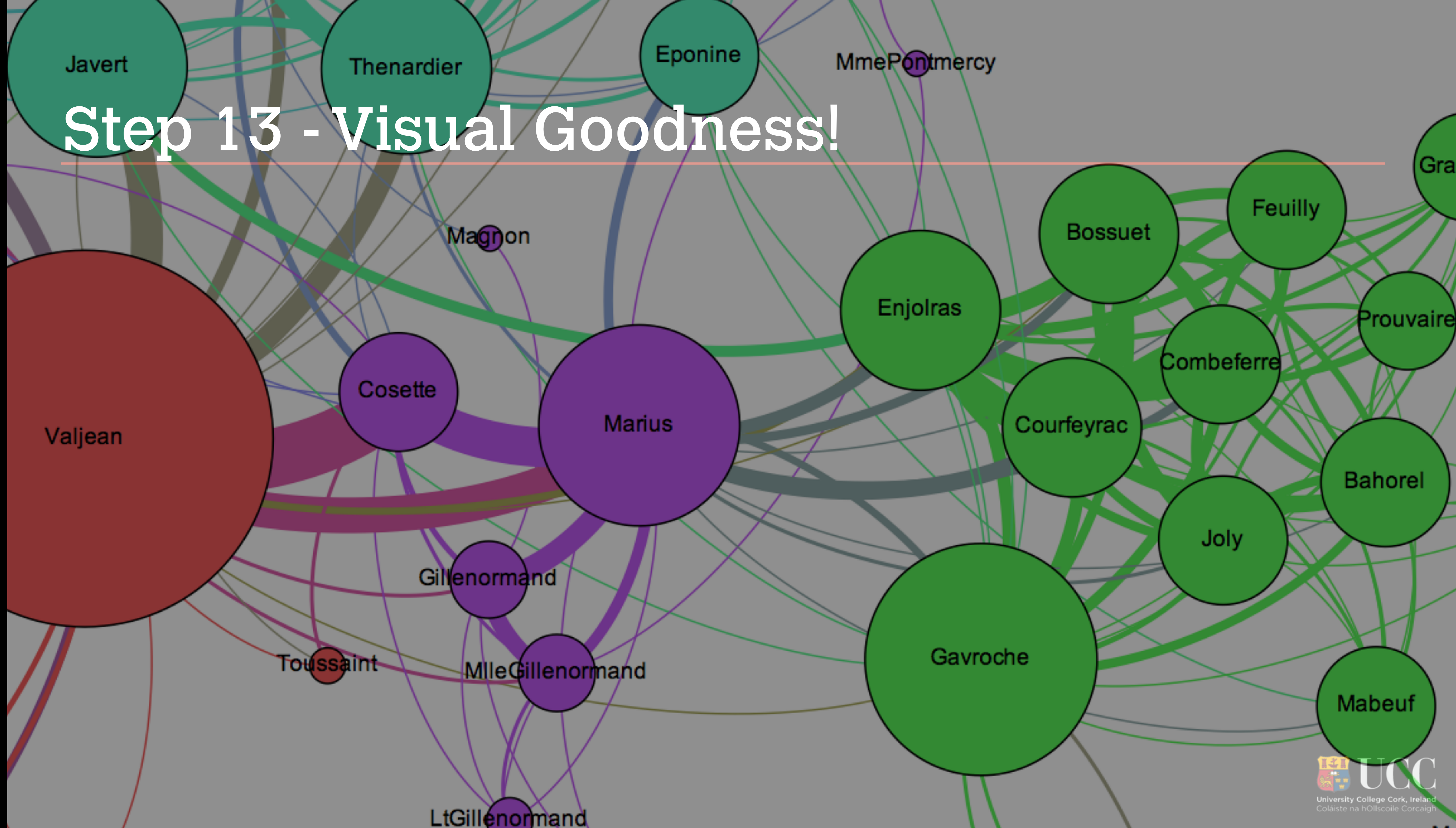
Step 12 - Export Graph

The screenshot shows the Gephi 0.8.2 - Project 0 interface. The top bar includes tabs for Overview, Data Laboratory, and Preview. The left sidebar contains the Preview Settings panel with sections for Presets (Default), Nodes (Border Width: 1.0, Border Color: custom [0,0,0], opacity: 100.0, Node Labels: Show Labels checked, Font: Arial 12 Plain, Proportional size unchecked, Color: custom [0,0,0], Shorten label unchecked, Max characters: 30, Outline size: 0.0, Outline color: custom [255,0,0], Outline opacity: 80.0, Box unchecked, Box color: parent, Box opacity: 100.0), and Edges (Show Edges checked, Thickness: 1.0, Rescale weight unchecked, Color: mixed, Preview ratio: 10...). The main Preview window displays a network graph with nodes and edges. An 'Export' dialog box is open, showing the 'Save As' field with 'Untitled.pdf' and a dropdown menu with 'shawnday'. Below this is a table of files and folders:

Name	Date Modified
2015conference.html	Wednesday, September 9, 2015 9:14 AM
Adlm	Tuesday, March 3, 2015 9:28 PM
Applications	Tuesday, December 8, 2015 11:02 AM
authors.html	Monday, February 9, 2015 8:30 AM
Calibre Library	Thursday, November 19, 2015 10:42 AM
CNEH	Wednesday, November 25, 2015 3:10 PM
CytoscapeConfiguration	Wednesday, November 18, 2015 12:13...
Desktop	Monday, March 14, 2016 10:13 AM

Below the table, the 'File Format' is set to 'PDF Files (*.pdf)'. At the bottom of the dialog are buttons for 'New Folder', 'Cancel', 'Save', and 'Options...'. The right sidebar contains the 'MultiMode Networks Proje...' panel with options for 'Load attributes', 'Attribute type:', 'Left matrix:', 'Right Matrix:', 'Remove Edges', 'Remove Nodes', 'Run', 'Graph Coloring', and 'Bipart'. The bottom status bar shows 'Workspace 0' and 'Background Reset zoom - +'.

Step 13 - Visual Goodness!



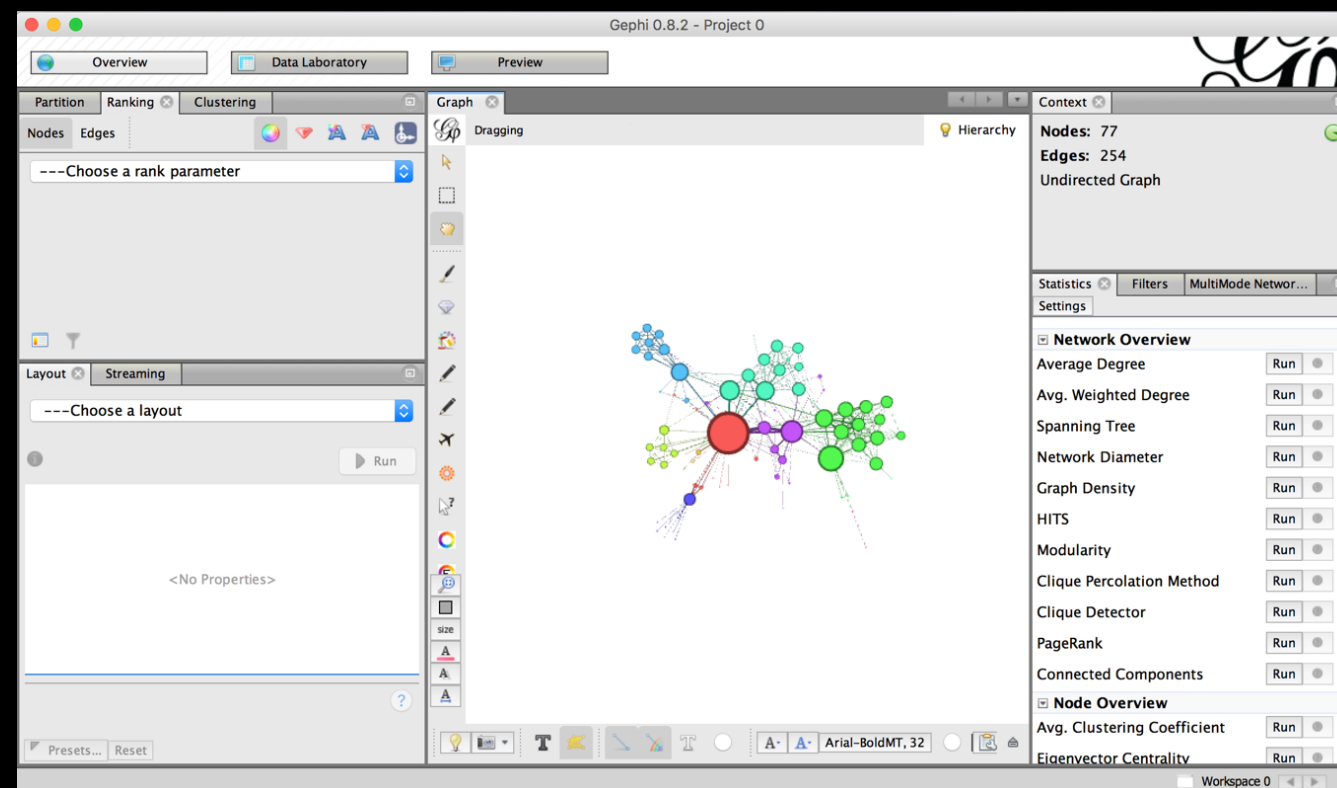
So What Can We Know?

- Centrality measures are essential metrics to analyze the position of an actor in a network.
- They come in many variations:
 - Degree centrality - number of connections
 - Closeness centrality - closeness to the entire network
 - Betweenness centrality - function within network
 - Eigenvector centrality - connection to well-connected nodes

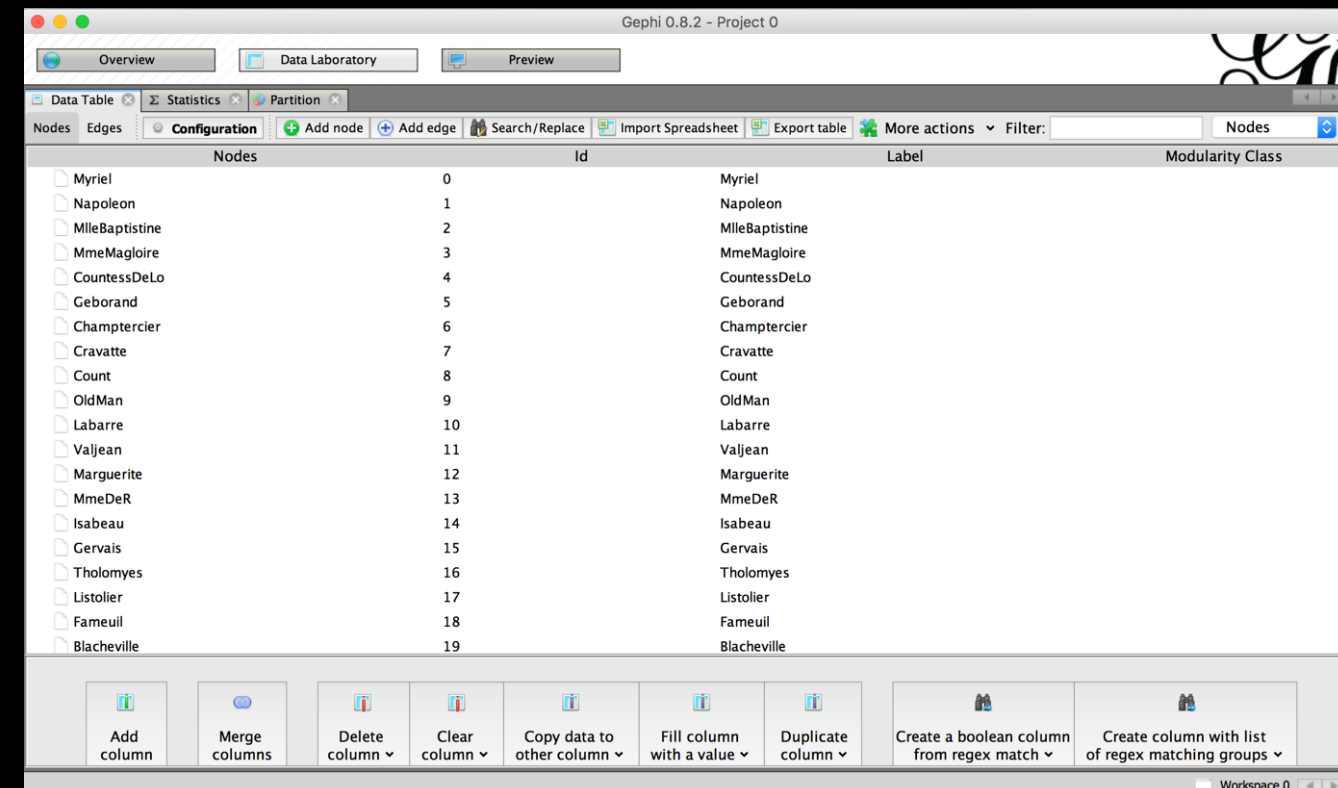
Gephi in More Detail: Loading Data

- Gephi loads directly from Excel or via CSV from others
- Gephi also supports richer formats that contain more attribute, layout and presentation data
- GEXF - More complex networks - multimodal.
- GML - GraphML - XML based interchange.

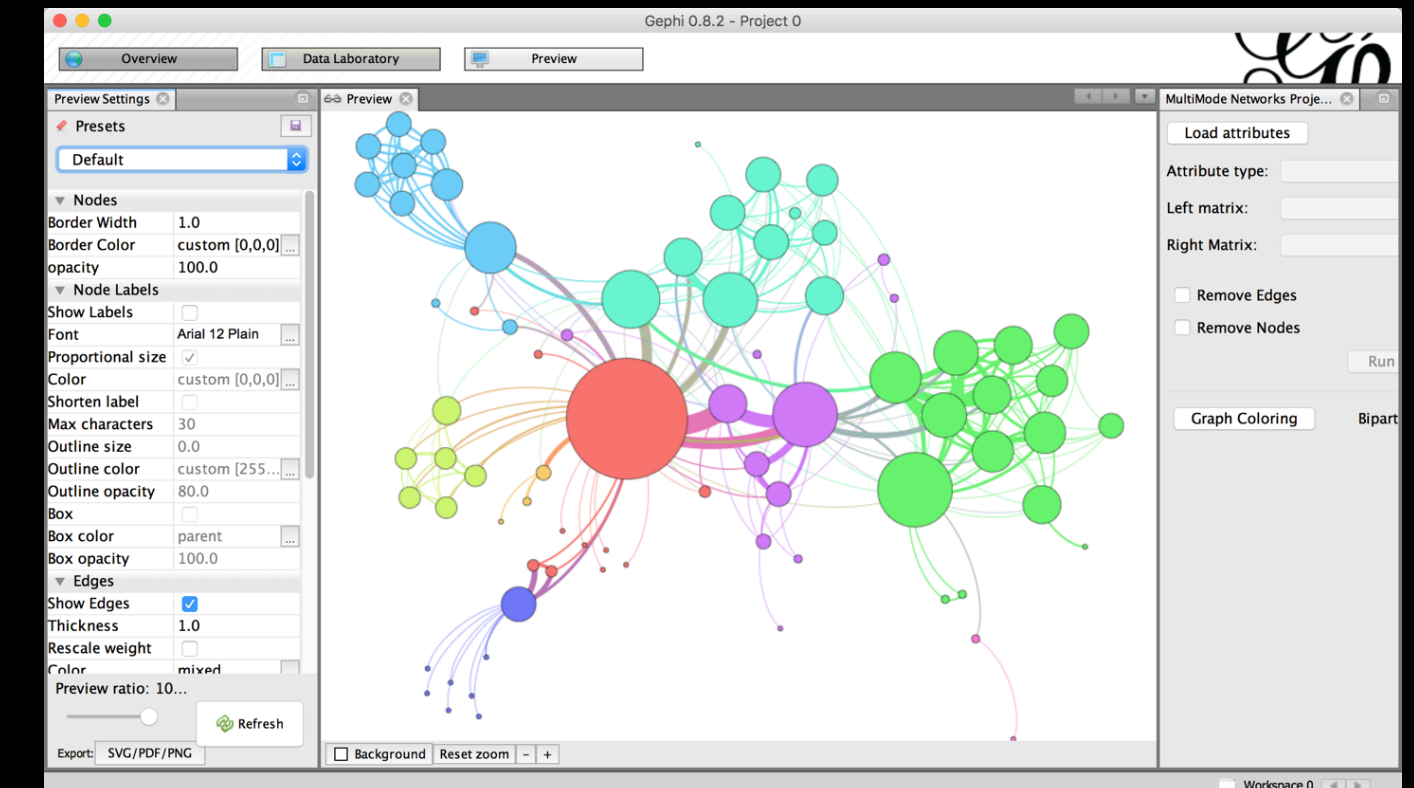
Gephi in More Detail: The Key Screens



Overview
Visual Analysis



Data
Manipulate and
Structure



Preview
Present for
Sharing

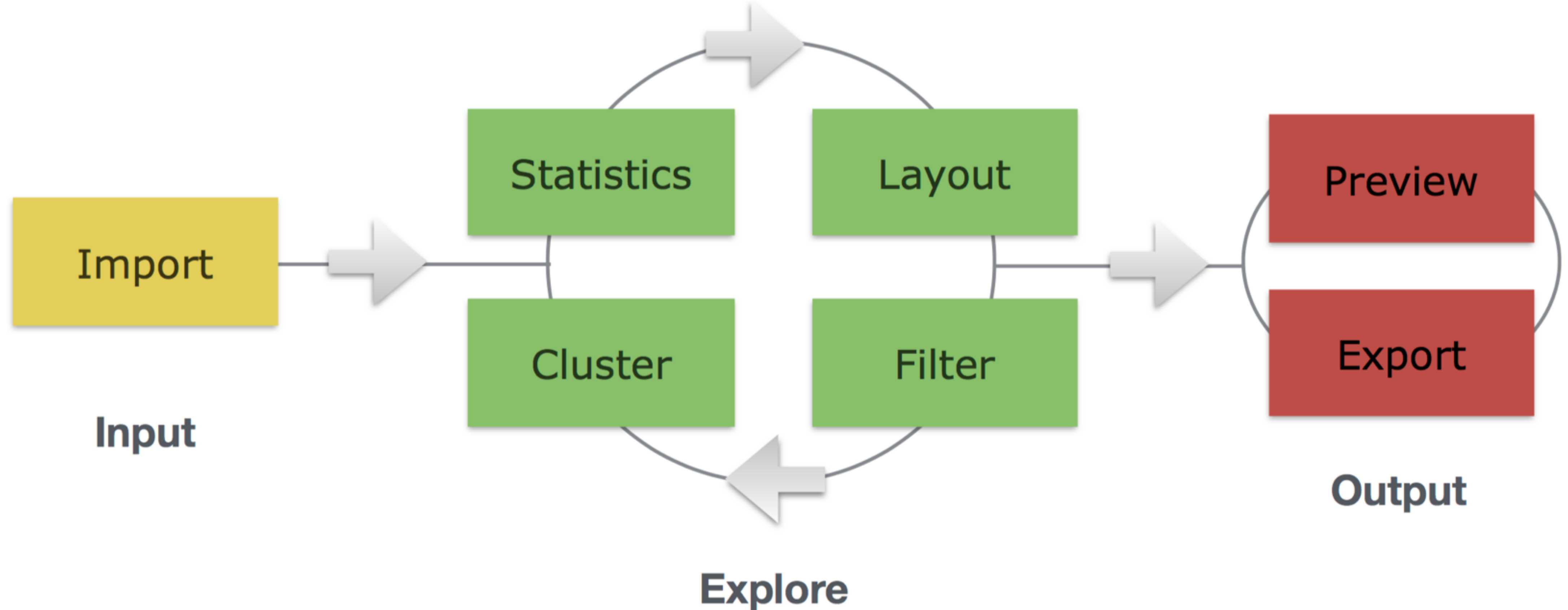
Overview Portal

The screenshot displays the Gephi 0.8.2 interface with several key components highlighted by red boxes and labels:

- Colouring and Grouping nodes:** Points to the 'Ranking' tab in the left sidebar, which includes a dropdown menu to 'Choose a rank parameter'.
- Select and Drag Nodes:** Points to the 'Graph' tab in the left sidebar, which includes a 'Dragging' sub-tab and a selection tool icon.
- Graph Summary:** Points to the 'Context' tab in the right sidebar, which displays network statistics: Nodes: 77, Edges: 254, and Undirected Graph.
- Algorithms and Attributes:** Points to the 'Layout' tab in the left sidebar, which includes a dropdown menu to 'Choose a layout' and a 'Run' button.
- Pan and Zoom:** Points to the 'Graph' tab in the left sidebar, which includes a 'Pan' tool icon.
- Edge and Label Text:** Points to the bottom toolbar, which includes a text tool icon and a font settings dropdown set to 'Arial-BoldMT, 32'.

The central workspace shows a network graph with nodes of various colors (red, green, blue, purple) and sizes, connected by edges. The bottom status bar indicates 'Workspace 0'.

The Gephi Process



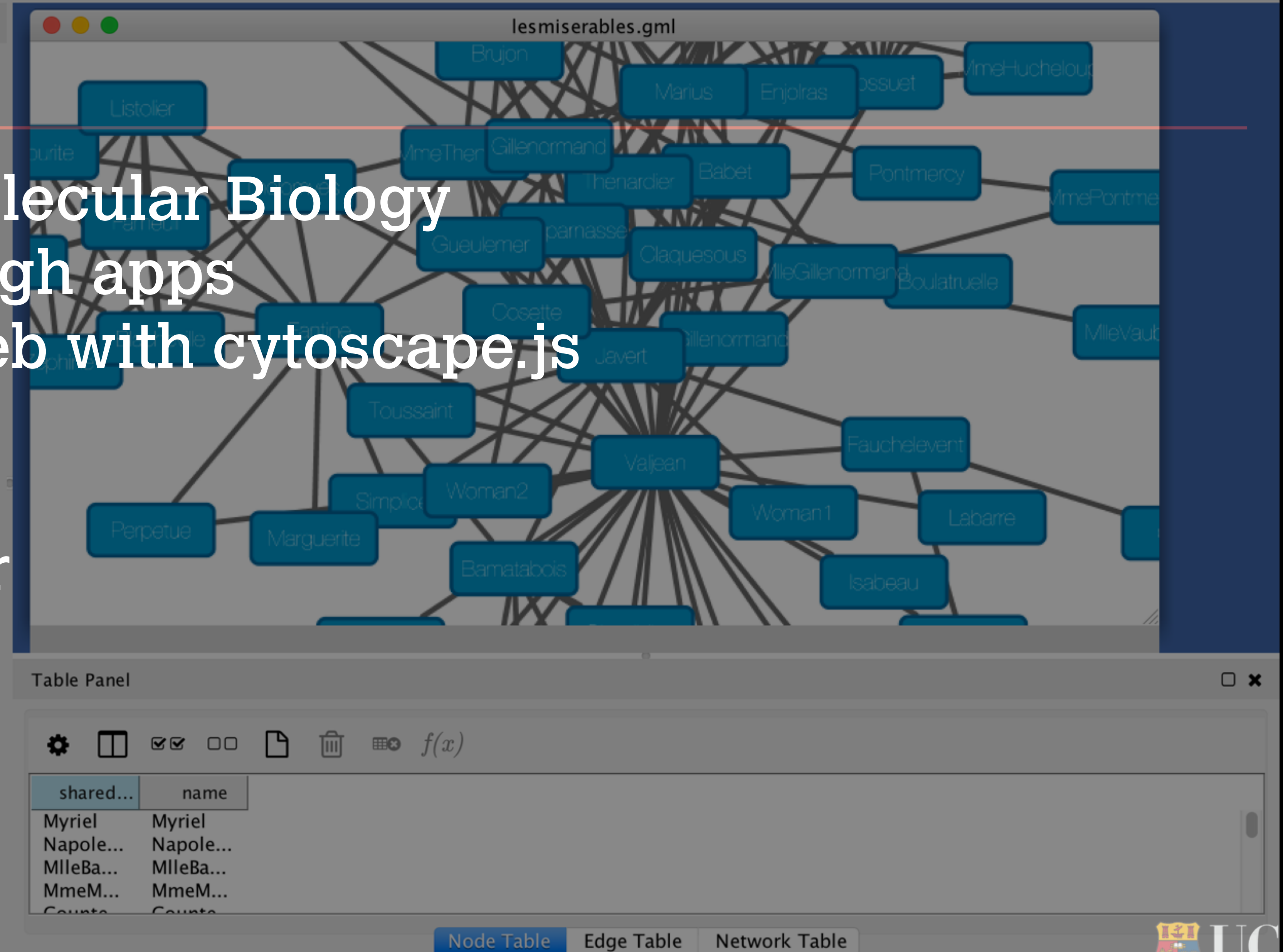
Source: Derek Greene from gephi.org

Alternate Tools

1. [Cytoscape](#)
2. [Pajek](#)
3. [NodeXL](#)
4. [LoxaWeb](#)
5. [Netminer](#)
6. [Social Networks Visualiser](#)
7. [Polinode](#)

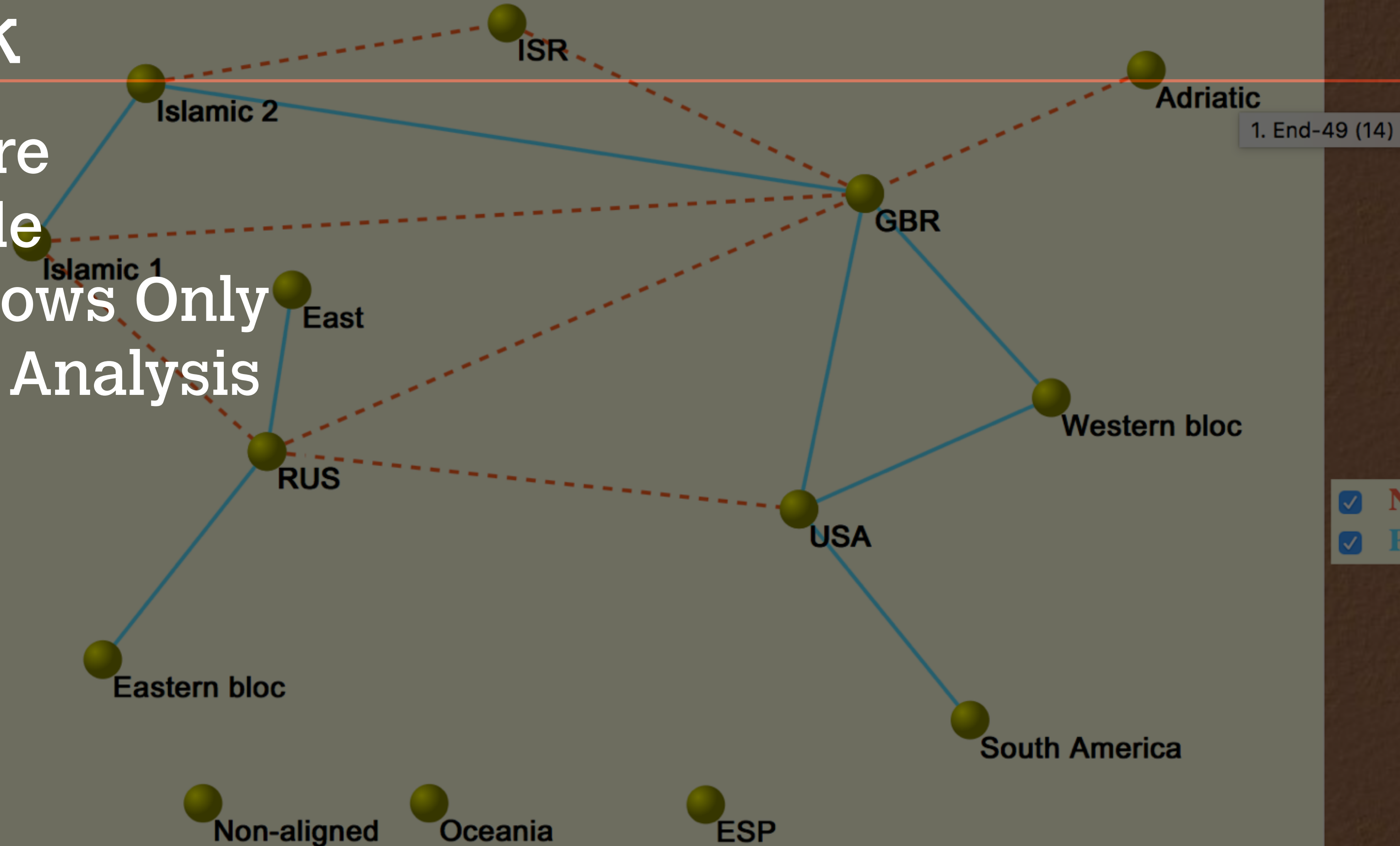
Cytoscape

- Designed for Molecular Biology
- Extensible through apps
- Exportable to web with cytoscape.js
- OpenSource
- V. User Friendly
- Mature - Popular




Pajek

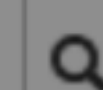
- ▶ Mature
- ▶ Simple
- ▶ Windows Only
- ▶ Solid Analysis
- ▶ Free



NodeXL

- › OpenSource Excel Template
- › Pro version allows direct API access to Social Media
- › Limited Algorithms
- › Good Clustering
- › Automation/Scripting for Repetitive Tasks

 amanning007 RT @samhwils: #HistoryByHillary "I don't know where Bernie was when I was trying to get health care in '93 and '94"



Description

Metrics

Metric 1

Metric 2

Metric 3

Metric 4

Metric 5

Metric 6

Metric 7

Metric 8

LoxaWeb

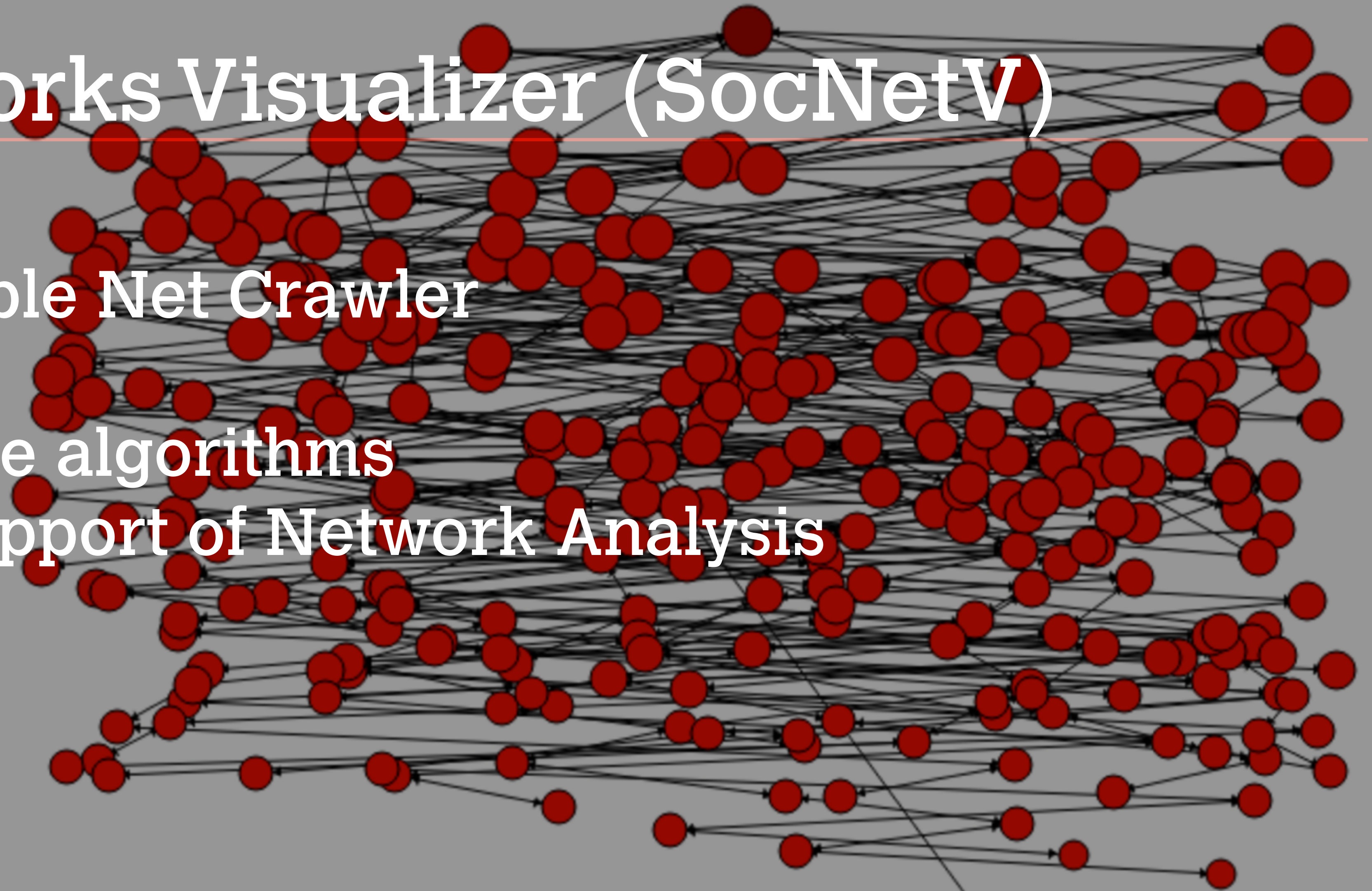
- ▶ Multimodal
- ▶ Web-based
- ▶ OpenSource
- ▶ Deploy Interactive to Web
- ▶ Limited Algorithms
- ▶ Supports Focussed Narrative Findings

Netminer

- Focused on Social Network Analysis
- Academic Pricing
- Commercial
- Batch and Scripted Processing
- Unique 3D Mapping
- No Interactive Graph Export Option

Social Networks Visualizer (SocNetV)

- ▶ OpenSource
- ▶ Includes a Simple Net Crawler
- ▶ Nice Wizard
- ▶ A couple unique algorithms
- ▶ Transparent support of Network Analysis



Polinode

- ▶ Web-based Application
- ▶ Positive Aesthetics
- ▶ Accessible
- ▶ Good Analysis
- ▶ Nicely Shareable
- ▶ Built in Survey Engine



Search by name...

Joey Foster

Attributes

Gender	Male
Perf Rating	4.21
Salary	88,0
Total Degree	6

Additional Resources

- Two Books
 - Mastering Gephi Network Visualisation- Ken Cherven
 - Network Graph Visualisation and Analysis with Gephi- Ken Cherven
- Scott: Social Network Analysis
- Weingart : Demystifying Networks
- Lemercier: Formal network methods in history: why and how?
- Düring: From Hermeneutics to Data to Networks: Data Extraction and Network Visualization of Historical Sources
- Meeks: More Networks in the Humanities or Did books have DNA?
- Hanneman: An Introduction to Social Network Methods
- Green: Practical Social Network Analysis Using Gephi - Derek Greene
- Easley: Networks, Crowds and Markets

Thanks

Shawn Day @iridium