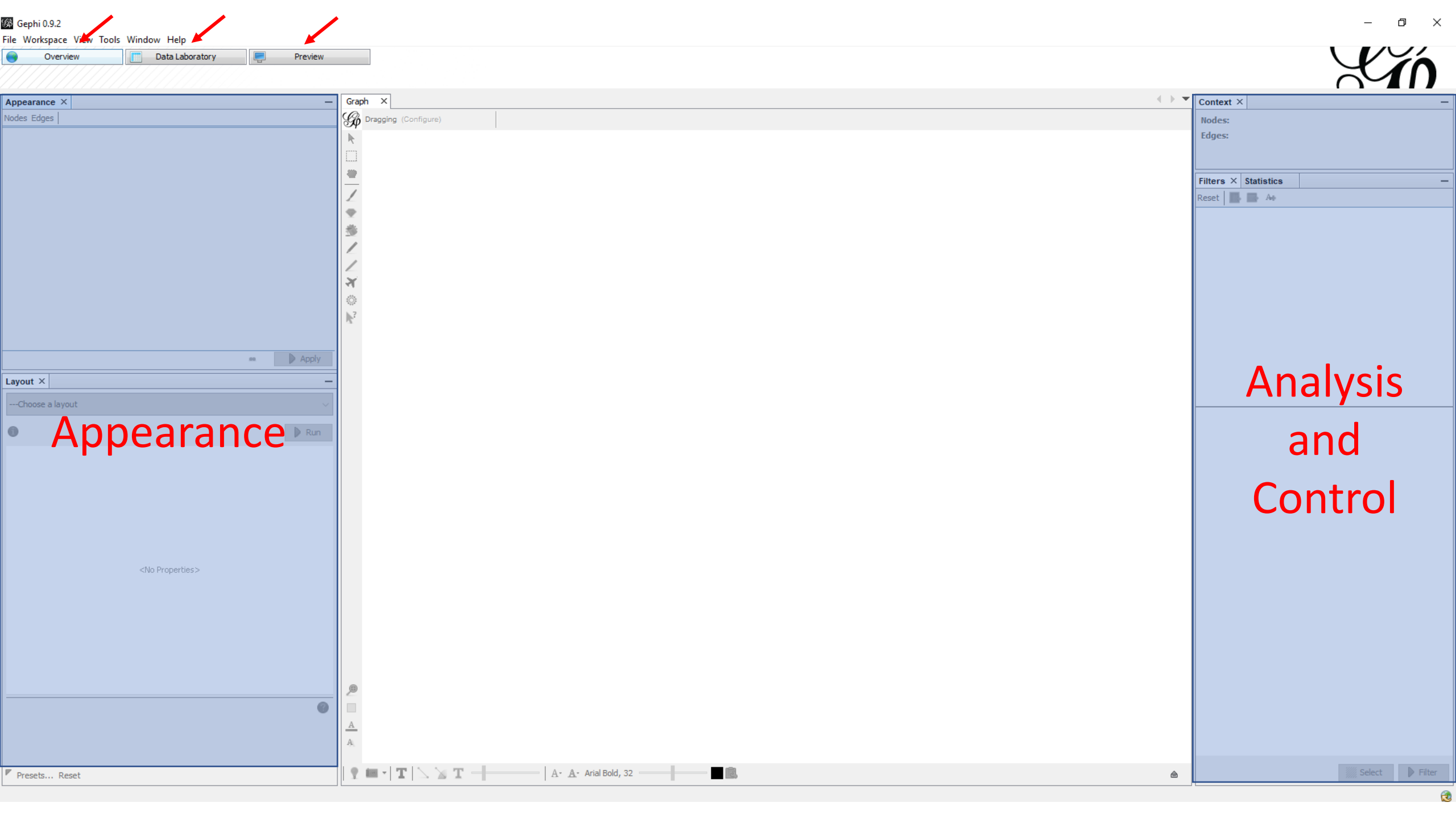


GE2234 Social Networks

for Media, Business and Technological Applications

Tutorial 1: Gephi Basics

By Dr. Wang Xiaohui, Vincent



Appearance panel content area.

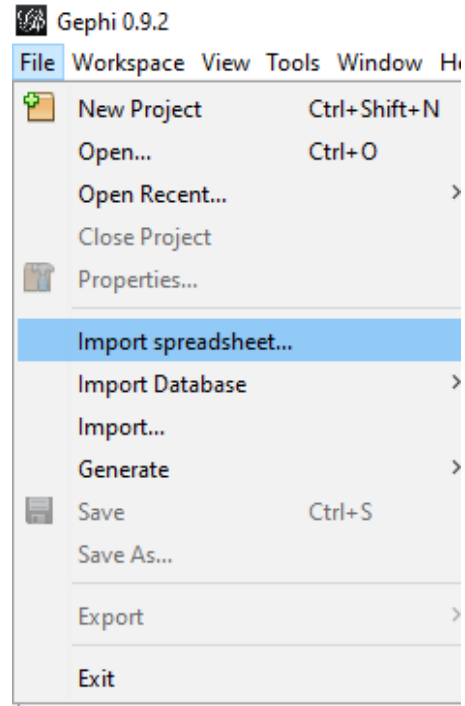
Appearance panel content area.

Graph panel content area.

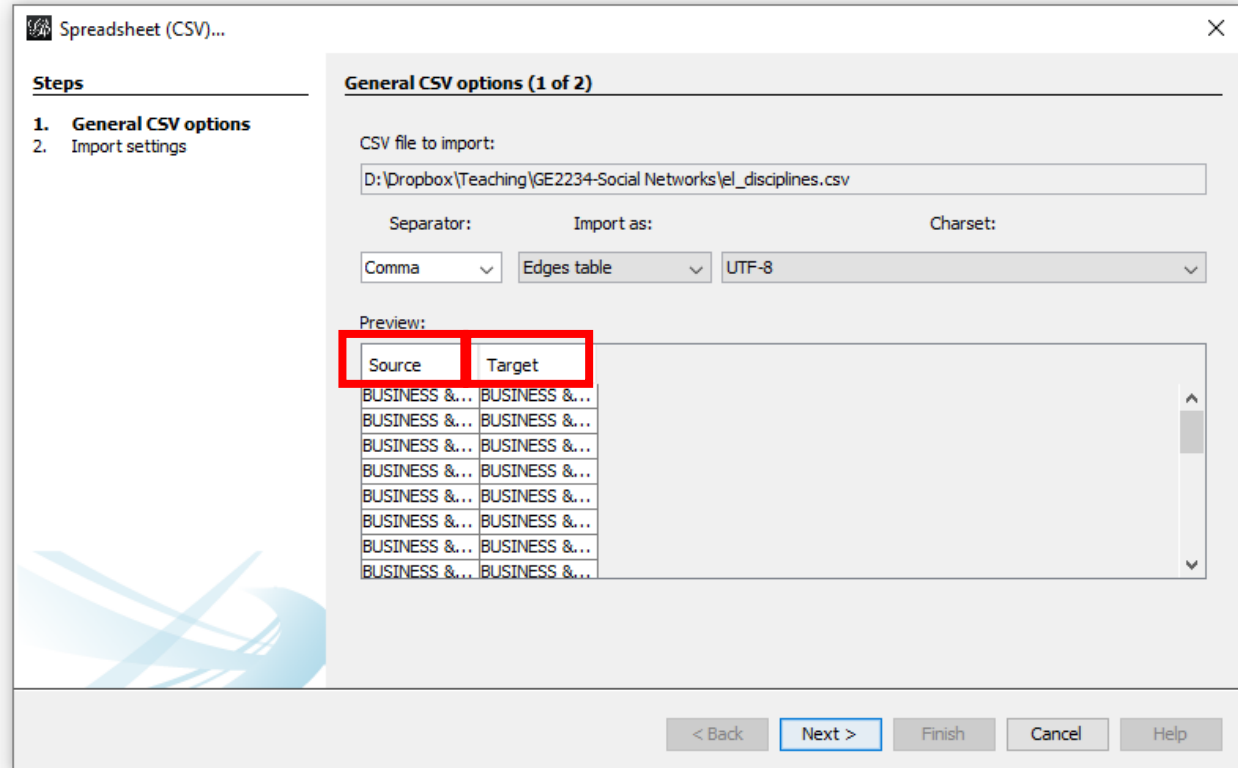
Context panel content area.

Analysis
and
Control

1.

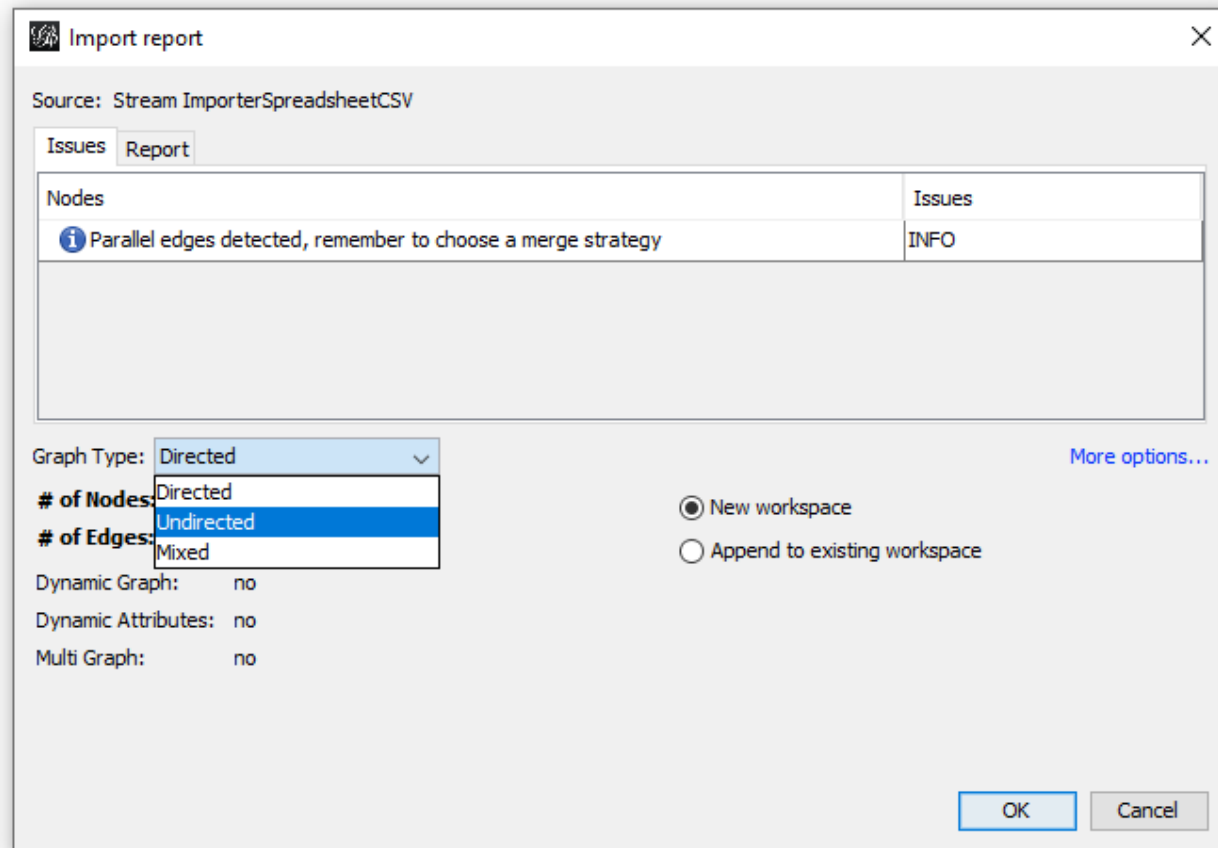


2.



- Import Spreadsheet -> el_disciplines.csv -> edge table
- Imported spreadsheet should be an edgelist with colname "Source" and "Target"

3.



The image shows a software dialog box titled "Import report" with a close button (X) in the top right corner. The source is set to "Stream ImporterSpreadsheetCSV". There are two tabs: "Issues" and "Report", with "Report" currently selected. The "Report" tab contains a table with two columns: "Nodes" and "Issues". The table has one row of data: "Parallel edges detected, remember to choose a merge strategy" under "Nodes" and "INFO" under "Issues". Below the table, there are several configuration options. "Graph Type:" is a dropdown menu currently showing "Directed", with a list of options (Directed, Undirected, Mixed) visible. To its right is a link "More options...". Below "Graph Type:" are labels for "# of Nodes:" and "# of Edges:", but they are partially obscured by the dropdown menu. Further down are three labels: "Dynamic Graph:", "Dynamic Attributes:", and "Multi Graph:", each followed by the value "no". To the right of these labels are two radio button options: "New workspace" (which is selected) and "Append to existing workspace". At the bottom right of the dialog are two buttons: "OK" and "Cancel".

Source: Stream ImporterSpreadsheetCSV

Issues Report

Nodes	Issues
Parallel edges detected, remember to choose a merge strategy	INFO

Graph Type: Directed

of Nodes:

of Edges:

Dynamic Graph: no

Dynamic Attributes: no

Multi Graph: no

☒ New workspace

☐ Append to existing workspace

More options...

OK Cancel

- Graph Type: Undirected -> OK

Context ×

Nodes: 144
Edges: 718
Undirected Graph

Filters
Statistics ×

Settings

Network Overview

Average Degree
Run

Avg. Weighted Degree
Run

Network Diameter
Run

Graph Density
Run

HITS
Run

Modularity
Run

PageRank
Run

Connected Components
Run

Node Overview

Avg. Clustering Coefficient
Run

Eigenvector Centrality
Run

Edge Overview

Avg. Path Length
Run

Dynamic

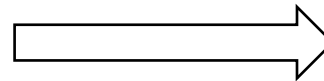
Nodes
Run

Edges
Run

Degree
Run

Clustering Coefficient
Run

- Describe the graph
- Statistic analysis area
- Try to run **diameter, density, connected components**
- And interpret



Context ×

Nodes: 144
Edges: 718
Undirected Graph

Filters
Statistics ×

Settings

Network Overview

Average Degree
Run

Avg. Weighted Degree
Run

Network Diameter
7
Run

Graph Density
0.07
Run

HITS
Run

Modularity
Run

PageRank
Run

Connected Components
12
Run

Node Overview

Avg. Clustering Coefficient
Run

Eigenvector Centrality
Run

Edge Overview

Avg. Path Length
2.633
Run

Dynamic

Nodes
Run

Edges
Run

Degree
Run

Clustering Coefficient
Run

Results:

Diameter: 7

Radius: 0

Average Path length: 2.632734530938124

Gephi 0.9.2 - Project 1 - Project 2

File Workspace View Tools Window Help

Overview **Data Laboratory** Preview

Workspace 1

Data Table

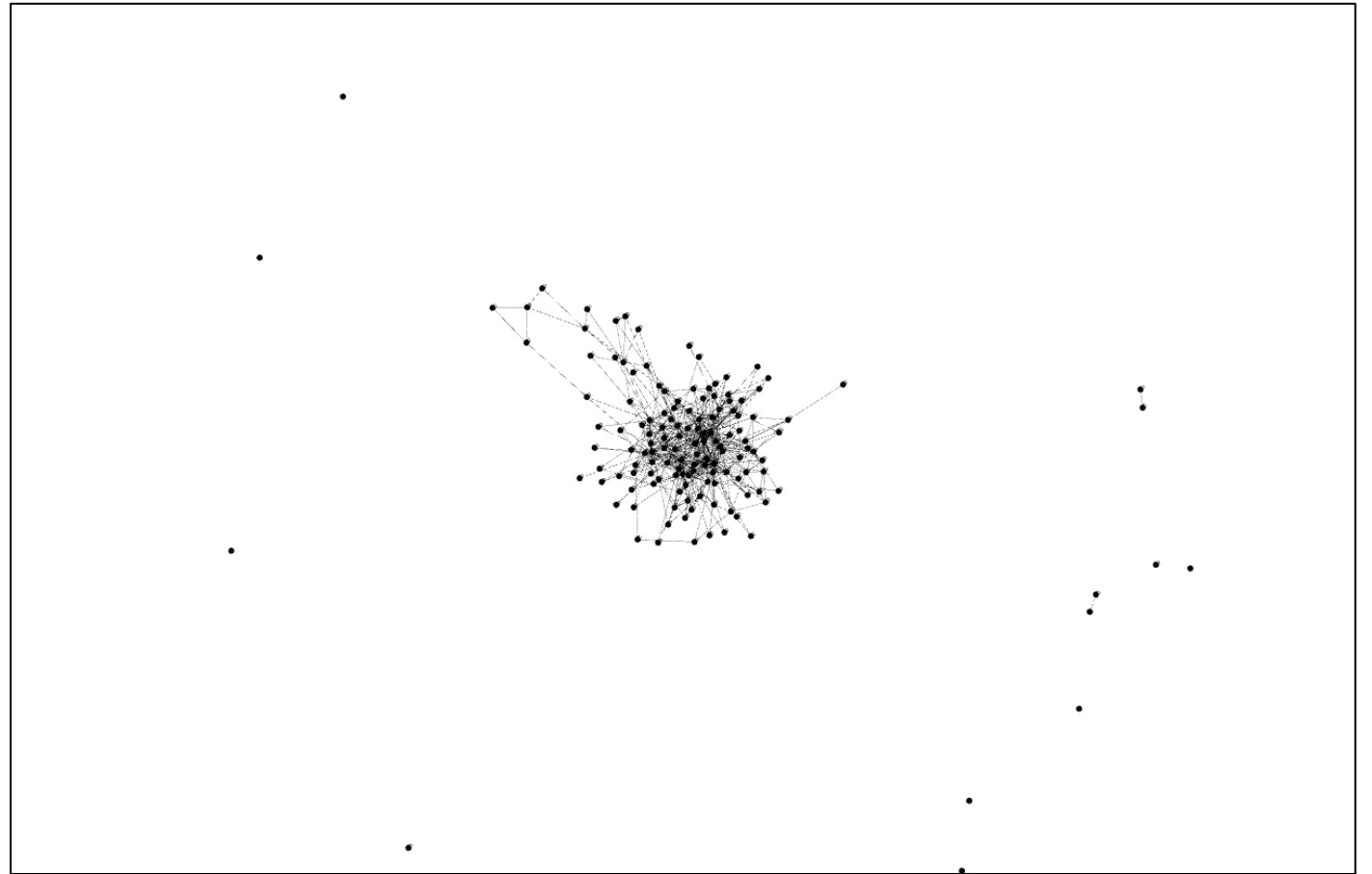
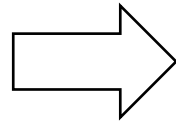
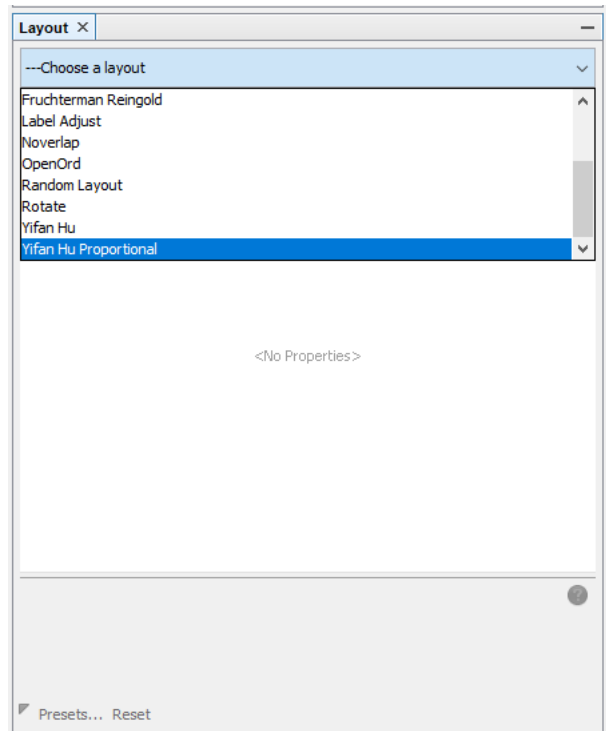
Nodes Edges Configuration Add node Add edge Search/Replace Import Spreadsheet Export table More actions Filter: Id

Id	Label	Interval	Eccentricity	Closeness Centrality	Harmonic Closeness Centrality	Betweenness Centrality	Component ID
BUSINESS & ECONO...			4.0	0.515873	0.596795	495.392994	0
COMPUTER SCIENCE			4.0	0.539419	0.626282	789.268273	0
INFORMATION SCIE...			5.0	0.42623	0.473974	20.032938	0
SOCIAL SCIENCES - ...			4.0	0.505837	0.577564	308.382864	0
PSYCHOLOGY			4.0	0.528455	0.60641	1149.553062	0
MATHEMATICS			4.0	0.492424	0.560256	331.209766	0
SCIENCE & TECHNO...			4.0	0.492424	0.553846	235.723165	0
COMMUNICATION			4.0	0.467626	0.515385	132.106045	0
GOVERNMENT & LAW			5.0	0.43771	0.49641	61.419153	0
MATHEMATICAL ME...			4.0	0.43771	0.475641	22.754887	0
INTERNATIONAL RE...			5.0	0.415335	0.456667	8.01818	0
PUBLIC ADMINISTR...			5.0	0.46595	0.525897	100.941406	0
GEOGRAPHY			5.0	0.469314	0.530385	229.519335	0
TELECOMMUNICATI...			5.0	0.414013	0.450256	0.820543	0
ENVIRONMENTAL SC...			4.0	0.550847	0.640385	1125.117951	0
EDUCATION & EDUC...			4.0	0.543933	0.609615	911.560268	0
WOMEN'S STUDIES			5.0	0.345745	0.373205	0.709841	0
ENGINEERING			4.0	0.548523	0.641667	1144.553721	0
HISTORY & PHILOS...			5.0	0.459364	0.520769	128.229917	0
OPERATIONS RESEA...			5.0	0.420712	0.466923	6.36989	0
SOCIOLOGY			4.0	0.488722	0.560897	309.420154	0
CULTURAL STUDIES			5.0	0.398773	0.437436	15.363883	0
BEHAVIORAL SCIEN...			4.0	0.460993	0.505128	143.369426	0
AGRICULTURE			5.0	0.464286	0.527821	358.180612	0
URBAN STUDIES			5.0	0.422078	0.475769	34.289664	0
NUTRITION & DIETE...			5.0	0.410095	0.452179	58.690268	0
TRANSPORTATION			5.0	0.43771	0.477821	2.918776	0
SOCIAL ISSUES			4.0	0.416667	0.474359	50.618087	0
NURSING			5.0	0.420712	0.464359	14.034686	0
ENERGY & FUELS			5.0	0.423453	0.477179	225.673158	0
FORESTRY			5.0	0.368272	0.398205	0.0	0
DEVELOPMENT STUD...			5.0	0.401235	0.45141	10.095714	0
FISHERIES			5.0	0.37037	0.405897	3.545177	0
FOOD SCIENCE & TE...			5.0	0.377907	0.414359	4.300998	0
PHYSICS			5.0	0.420712	0.472051	120.823953	0
HEALTH CARE SCIE...			4.0	0.451389	0.513462	131.594086	0
MEDICAL INFORMAT...			4.0	0.424837	0.469231	48.761523	0
CHEMISTRY			5.0	0.414013	0.473333	144.811962	0
AUTOMATION & CO...			5.0	0.391566	0.432949	2.934048	0
NEUROSCIENCES & ...			4.0	0.471014	0.526282	494.739323	0
ROBOTICS			4.0	0.398773	0.428205	4.517597	0

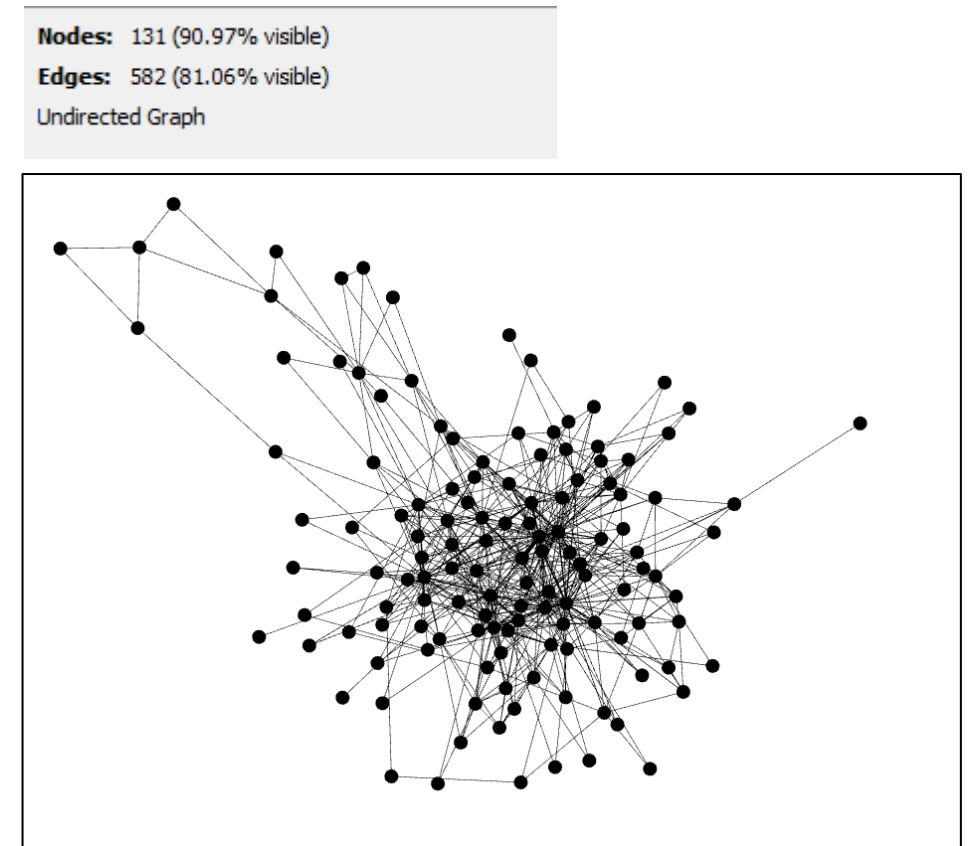
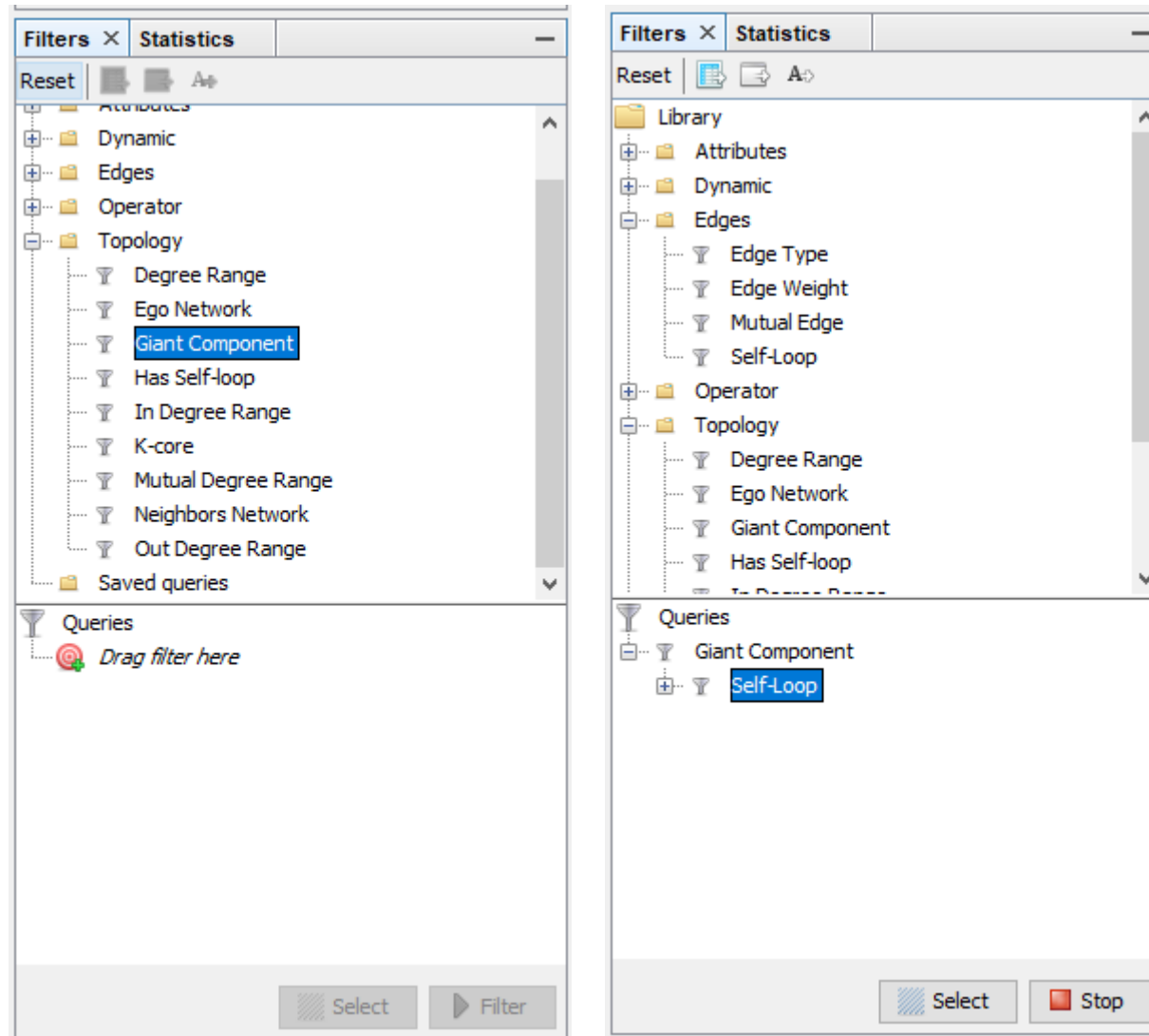
Add column Merge columns Delete column Clear column Copy data to other column Fill column with a value Duplicate column Create a boolean column from regex match Create column with list of regex matching groups Negate boolean values Convert column to dynamic

- Node Attribute Table
- And the Edge Attribute Table
- More attributes appeared after statistic analysis

Let's try some fancy stuff – Layout Design



Add Filters to improve the layout



Much better

- Drag the attribute to the Queries panel, can include parent and child queries, and click **Filter**

Add labels to the node and show on the graph

Gephi 0.9.2 - Project 1 - Project 2

File Workspace View Tools Window Help

Overview Data Laboratory Preview

Workspace 1 X

Data Table X

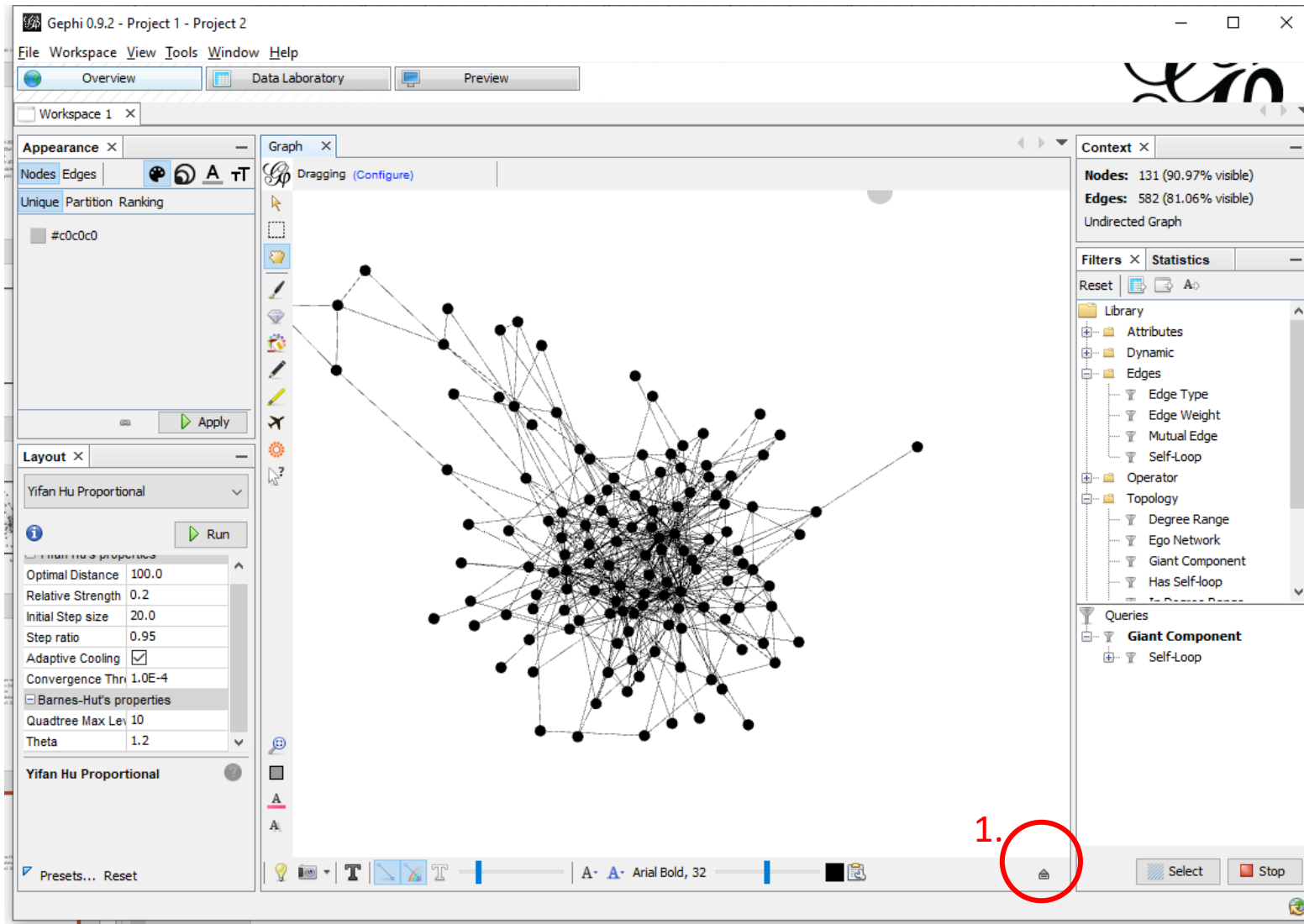
Nodes Edges Configuration Add node Add edge Search/Replace Import Spreadsheet Export table More actions

Id	Label	Interval	Eccentricity	Closeness Centrality	Harmonic Closeness Centrality
BUSINESS & ECONOMICS			4.0	0.515873	0.596795
COMPUTER SCIENCE			4.0	0.539419	0.626282
INFORMATION SCIENCE ...			5.0	0.42623	0.473974
SOCIAL SCIENCES - OTHE...			4.0	0.505837	0.577564
PSYCHOLOGY			4.0	0.528455	0.60641
MATHEMATICS			4.0	0.492424	0.560256
SCIENCE & TECHNOLOGY ...			4.0	0.492424	0.553846
COMMUNICATION			4.0	0.467626	0.515385
GOVERNMENT & LAW			5.0	0.43771	0.49641
MATHEMATICAL METHOD...			4.0	0.43771	0.475641
INTERNATIONAL RELATIO			5.0	0.415335	0.456667
PUBLIC ADMINISTRATION			5.0	0.46595	0.525897
GEOGRAPHY			5.0	0.469314	0.530385
TELECOMMUNICATIONS			5.0	0.414013	0.450256
ENVIRONMENTAL SCIENC...			4.0	0.550847	0.640385
EDUCATION & EDUCATIO...			4.0	0.543933	0.609615
WOMEN'S STUDIES			5.0	0.345745	0.373205
ENGINEERING			4.0	0.548523	0.641667
HISTORY & PHILOSOPHY ...			5.0	0.459364	0.520769
OPERATIONS RESEARCH ...			5.0	0.420712	0.466923
SOCIOLOGY			4.0	0.488722	0.560897
CULTURAL STUDIES			5.0	0.398773	0.437436
BEHAVIORAL SCIENCES			4.0	0.460993	0.505128

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

- First we need to copy the node names (Id column) to the Label column
- Copy data to other column -> Id -> Label. Done

Add labels to the node and show on the graph



- Back to the Overview page
- Click the unfold icon under the Graph panel, choose Label, and click nodes

Click to unfold the options

Add labels to the node and show on the graph

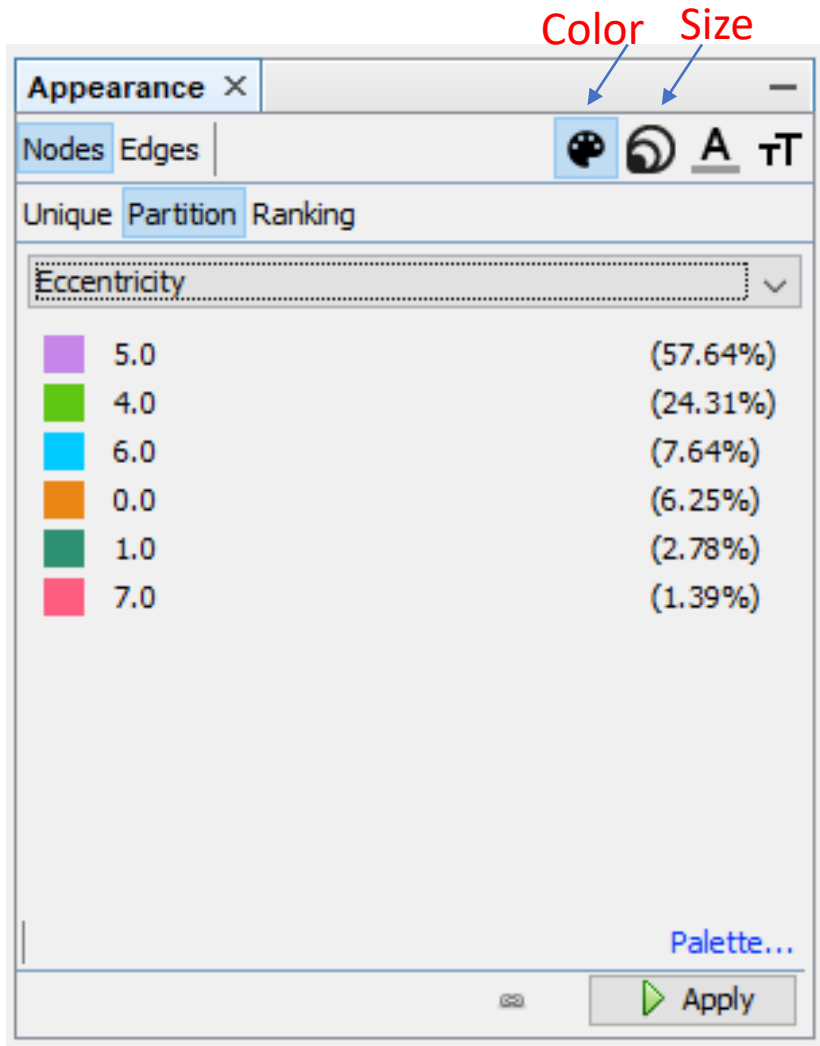
The screenshot displays a network visualization software interface with a central graph showing a dense network of academic disciplines. The interface is divided into several panels:

- Appearance:** Contains tabs for Nodes, Edges, and Unique. The Unique tab is selected, showing a color picker set to #c0c0c0 and an Apply button.
- Layout:** Contains a dropdown menu set to Yifan Hu Proportional and a Run button.
- Context:** Displays statistics: Nodes: 131 (90.97% visible), Edges: 582 (81.06% visible), and Undirected Graph. It also has tabs for Filters and Statistics.
- Library:** A list of filter categories including Attributes, Dynamic, Edges, Operator, and Topology.
- Queries:** A list of queries including Giant Component and Self-Loop.
- Bottom Toolbar:** Contains tabs for Global, Edges, and Labels. The Labels tab is active, showing settings for Node and Edge labels. The Node label settings are: Node ☒, Font: Arial Bold, 32, Color: Black, Size: Scaled. The Edge label settings are: Edge ☐, Font: Arial Bold, 32, Color: Grey, Size: Scaled.

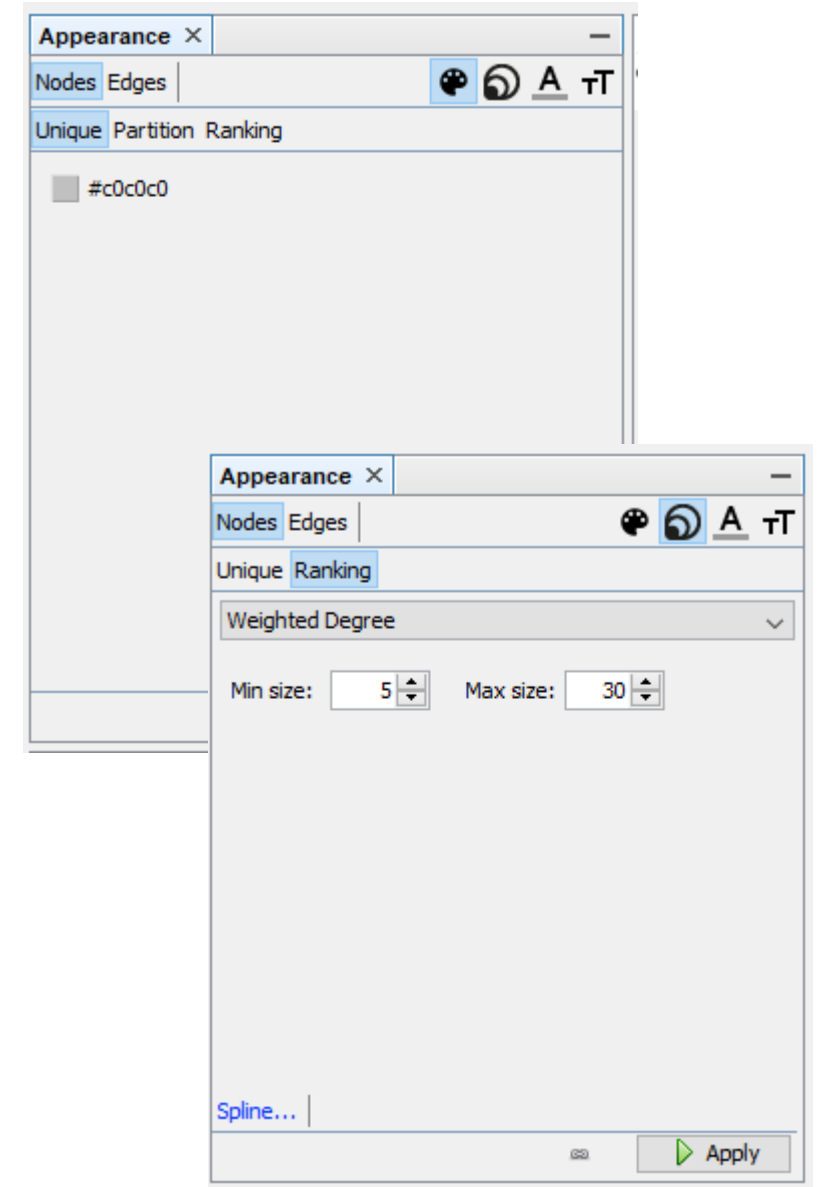
Red text overlay: 3. Click Node to show the labels on nodes

Define the node and edge attributes (most important)

- Size, color, and shape



- **Unique:** same color for all nodes
- **Partition:** categorical color for each group of nodes
- **Ranking:** range of color for continue values



Preview X

2

 Refresh☐ Background Reset zoom - +