

“Qualitative and quantitative methodologies for the assessment of rangeland governance”  
INRAT, 3<sup>rd</sup> to 5<sup>th</sup> of December 2019.

# SNA : Social Network Analysis

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Dr. Aymen Frija

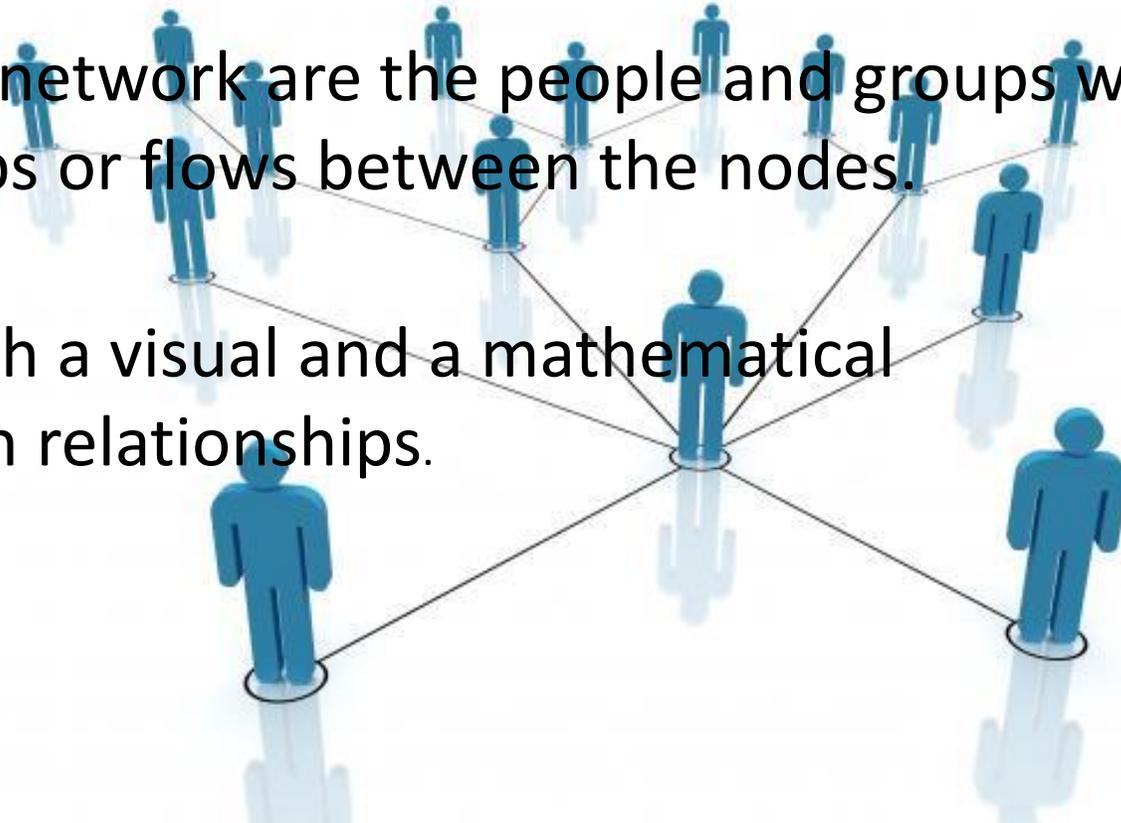
# Introduction to Social Network Analysis

# Introduction to Social Network Analysis

Social network analysis SNA is the mapping and measuring of relationships and flows between people, groups, organizations, computers, URLs, and other connected information/knowledge entities.

The nodes in the network are the people and groups while the links show relationships or flows between the nodes.

**SNA** provides both a visual and a mathematical analysis of human relationships.



# Introduction to Social Network Analysis

There are 4 main Centrality Statistics that the SNA provides :

- Degree Centrality
- Betweenness Centrality
- Closeness Centrality
- Eigenvector centrality

# Introduction to Social Network Analysis

## **Directed and Undirected Graphs :**

The concept of *undirected* link is nothing but an abstraction for two directed links (one in each direction).

In directed graphs directions matter : the relation goes from node 1 to node 2 and can't go from node 2 to node 1.

# Introduction to Social Network Analysis

## **Degree Centrality :**

It is an indicator that shows the number of links passing through a node.

In the case of oriented graphs : The indicators then contains two-degree centrality measures :

<b>Degree Centrality</b>	
In-Degree	Out-Degree

In-Degree mainly count in-coming links to the node.

Out-Degree count out links/flows from the node.

# Introduction to Social Network Analysis

## **Betweenness Centrality**

Betweenness Centrality is an indicator to measure how many times an actor is on the shortest path between a pair of other actors.

This indicator was developed by Linton Freeman.

The actor is more central when he connects the other peers of the actors the most.

# Introduction to Social Network Analysis

## **Closeness Centrality**

It measures the proximity of an actor to other actors in a social network.

This indicator was also developed by Freeman.

The indicator is a measure of overall centrality that can be interpreted that an actor is strategic (or advantageous) in a network if it is close to the maximum of other actors (Freeman 1978).

 In other words, the measure shows the degree of importance of an actor if he can build links easily with a large number of actors with a minimum effort

# Introduction to Social Network Analysis

## **Eigenvector centrality**

is a measure of the influence of a node in a network.

# Introduction to Social Network Analysis

## **Additional Centrality Indicator : The Weighted Degree Centrality WDC :**

In weighted networks the degree centrality is calculated as the sum of weights assigned to the node's direct connections and represents the node strength (Strength Centrality—SC). It is then based on tie weights and not on the number of ties.

# Rangelands Governance and management and the use of the SNA approach

# Rangelands Governance and management and the use of the SNA approach

The conservation and management of natural resources operates in social–ecological systems in which resource users are embedded in social and environmental contexts that influence their management decisions.

Characterizing social networks of resource users can be used to inform understanding of social influences on decision making, and social network analysis (SNA) has emerged as a useful technique to explore these relationships

# Rangelands Governance and management and the use of the SNA approach

Effective and sustainable management of natural resources by communities or private individuals is an essential factor in reducing the loss of biodiversity, complementing or enhancing protected areas, and enabling landscape-scale conservation approaches that target important natural ecosystems.

# Rangelands Governance and management and the use of the SNA approach

In SNA, concepts from graph theory are used to construct networks in which nodes often symbolize actors (e.g., individuals, organizations) and ties between the nodes symbolize ways in which actors are connected.

Networks can be visualized from the perspective of individuals (actors) and their connections, known as egocentric networks, or visualized as whole networks, where the position of individuals are viewed relative to each

# Practical Training

# Practical Training

## Gephi

Gephi is an interactive visualization and exploration platform for all kinds of complex networks and systems, dynamic and hierarchical graphics.



# Practical Training

Gephi is a tool for people who need to explore and understand graphs. Like Photoshop but for data, the user interacts with the representation, manipulates structures, shapes and colors to reveal hidden properties.

The objective of these tools is to help users discover models and make hypotheses through effective dynamic filtering and iterative visualization routines.

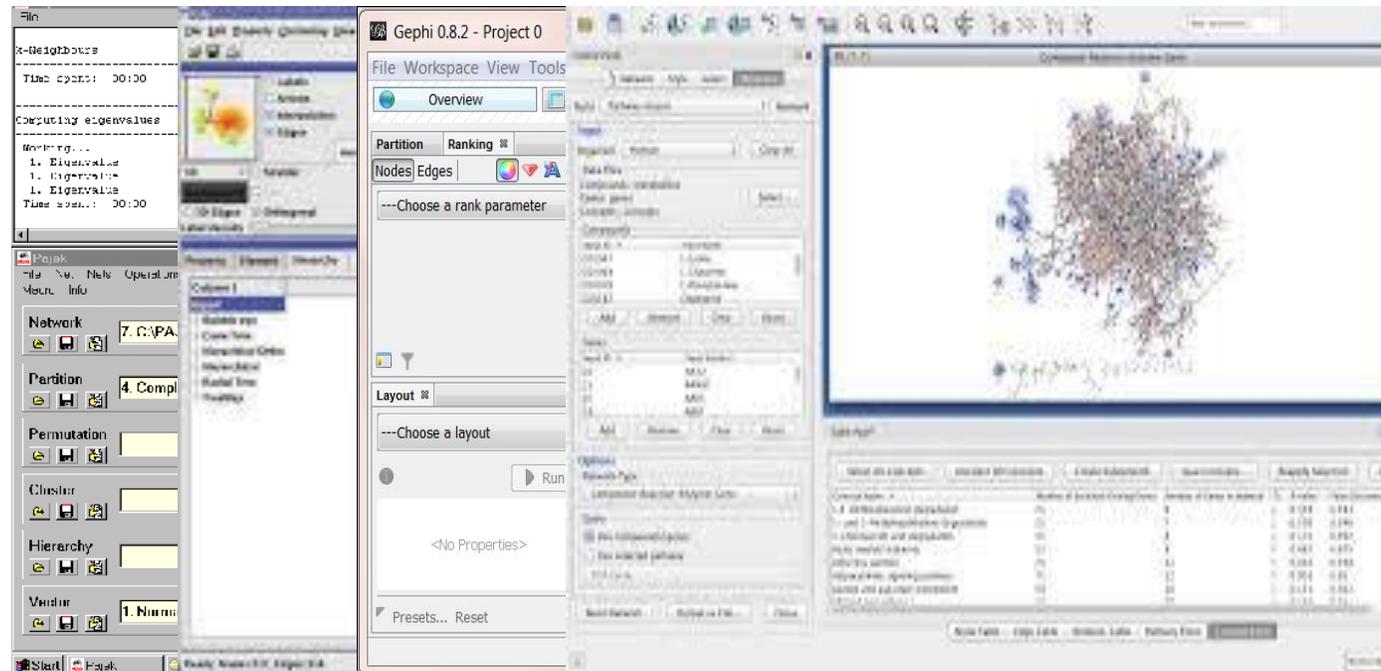
# Practical Training

As a generic tool, it is applicable to exploratory data analysis, link analysis, social network analysis, biological network analysis and poster design.

Gephi comes with a wide variety of layout algorithms.

# Practical Training

According to Georgios A. Pavlopoulos et al, Pajek, Tulip, Gephi and Cytoscape are the best candidates for visualization and analysis of large-scale networks, and Gephi's is ranked first (Pavlopoulos et al. 2017).



# Download Gephi

The screenshot shows a web browser window with the URL <https://gephi.org/users/download/>. The page features the Gephi logo and tagline "makes graphs handy" in the top left. A navigation menu includes links for "Download", "Blog", "Wiki", "Forum", "Support", and "Bug tracker". A secondary menu contains "Home", "Features", "Learn", "Develop", "Plugins", "Services", and "Consortium".

## Download

Gephi is an open-source and multiplatform software distributed under the dual license [CDDL 1.0](#) and [GNU General Public License v3](#).

### Official Releases

[Release Notes](#) | [System Requirements](#) | [Installation instructions](#)

Gephi 0.9.2 is the latest stable release.

[Download Gephi for Windows](#)  
Version 0.9.2

If you have an older Gephi on your computer, you should uninstall it first, [see the installation instructions](#).

**All downloads:**

- [Download Gephi 0.9.2 for Mac OS X](#)
- [Download Gephi 0.9.2 for Windows](#)
- [Download Gephi 0.9.2 for Linux](#)
- [Download Gephi 0.9.2 sources](#)
- [Download Older Versions](#)

**Sources:**

Gephi uses [GitHub](#) to host the source code and track issues. The [trunk](#) repository is the most up-to-date version but may be unstable. The last stable version is located in the release tab on GitHub.

**Stay informed**  
blog, twitter & more

**Contribute**  
code, doc, test & more

**Report a Bug**

**Request a Feature**

**Share your ideas**

**Ways to get help**

- 2) Get Personal Help
- 3) Other Gephi Support
- 4) Get Professional Training Courses

**New to Gephi?**

- Installing Gephi
- System Requirements

# Download Gephi

The screenshot shows the Gephi website's download page. The browser address bar displays `https://gephi.org/users/download/`. The website header includes the Gephi logo with the tagline "makes graphs handy" and a navigation menu with links for Home, Features, Learn, Develop, Plugins, Services, and Consortium. A secondary menu contains links for Download, Blog, Wiki, Forum, Support, and Bug tracker. The main content area features a large "Download" heading, followed by a paragraph stating that Gephi is open-source and multiplatform, distributed under the CDDL 1.0 and GNU General Public License v3. Below this is the "Official Releases" section, which includes links for Release Notes, System Requirements, and Installation, and notes that Gephi 0.9.2 is the latest stable release. A prominent green "Down" button is visible. A Windows file dialog box is overlaid on the page, titled "Ouverture de gephi-0.9.2-windows.exe", showing the selected file "gephi-0.9.2-windows.exe" (71.8 Mo) and asking if the user wants to register the file. The dialog has "Enregistrer le fichier" and "Annuler" buttons. On the right side of the page, there are several orange call-to-action buttons: "Stay informed" (blog, twitter & more), "Contribute" (code, doc, test & more), "Report a Bug", "Request a Feature", and "Share your ideas". At the bottom right, there are sections for "Ways to get help" (listing personal help, other support, and training courses) and "New to Gephi?" (listing installation and system requirements).

https://gephi.org/users/download/

Download Blog Wiki Forum Support Bug tracker

Home Features Learn Develop Plugins Services Consortium

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**Down**

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- Installing Gephi
- System Requirements

# Import Data

The screenshot displays the Gephi 0.9.2 Data Laboratory interface. The window title is "Gephi 0.9.2 - Project 1". The menu bar includes "File", "Workspace", "View", "Tools", "Window", and "Help". Below the menu bar are three tabs: "Overview", "Data Laboratory" (which is active), and "Preview". The "Data Laboratory" tab contains a sub-tab for "Workspace 1" and another for "Data Table". The "Data Table" sub-tab is active and shows a table with three columns: "Id", "Label", and "Interval". The table is currently empty. Above the table, there is a toolbar with several icons: "Nodes", "Edges", "Configuration", "Add node", "Add edge", "Search/Replace", "Import Spreadsheet" (highlighted), "Export table", and "More actions". A "Filter:" dropdown menu is set to "Id". At the bottom of the interface, there is a row of ten buttons for data manipulation: "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", and "Convert column to dynamic".

# Import Data

The screenshot displays the Gephi 0.9.2 software interface. The main window is titled "Gephi 0.9.2 - Project 1" and includes a menu bar (File, Workspace, View, Tools, Window, Help) and a toolbar with options like Overview, Data Laboratory, and Preview. The workspace is currently in "Data Table" view, showing a single column labeled "Id".

An "Open" dialog box is overlaid on the workspace, set to the "Data File" location. The dialog shows a list of files, with "Edges" and "Nodes" selected. The "File name" field contains "Nodes.csv" and the "Files of type" dropdown is set to "All Files". The "Open" button is highlighted.

At the bottom of the interface, there is a toolbar with various data manipulation actions:

- 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

# Import Data

Gephi 0.9.2 - Project 1  
File Workspace View Tools Window Help

Overview Data Laboratory Preview

Workspace 1 x

Data Table x Graph x

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

Id

Spreadsheet (CSV)...

**Steps**

1. General CSV options
2. Import settings

**General CSV options (1 of 2)**

CSV file to import:  
C:\Users\maryem\Desktop\Training ICARDA-IRA 3-5 december\SNA\Data File\Nodes.csv

Separator: Semicolon Import as: Nodes table Charset: UTF-8

Preview:

Id	Label	Category	Decision m...
1	IRA	Research	Yes
2	CRDA	Administration	Yes
3	Forest	Administration	Yes
4	ICARDA	Research	No
5	UTAP	NGO	No
6	GDA Waara	NGO	Yes
7	GDA Dhaher	NGO	Yes
8	SMSA BK	Business	No

< Back Next > Finish Cancel Help

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

# Import Data

Gephi 0.9.2 - Project 1

File Workspace View Tools Window Help

Overview Data Laboratory Preview

Workspace 1

Data Table Graph

Nodes Edges Configuration Add node Add edge

Filter: Id

**Import report**

Source: Stream ImporterSpreadsheetCSV

Issues Report

No issue found during import

Graph Type: Mixed [More options...](#)

**# of Nodes:** 15

**# of Edges:** 0

Dynamic Graph: no

Dynamic Attributes: no

Multi Graph: no

New workspace

**Append to existing workspace**

OK Cancel

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

# Import Data

Gephi 0.9.2 - Project 1

File Workspace View Tools Window Help

Overview Data Laboratory Preview

Workspace 1

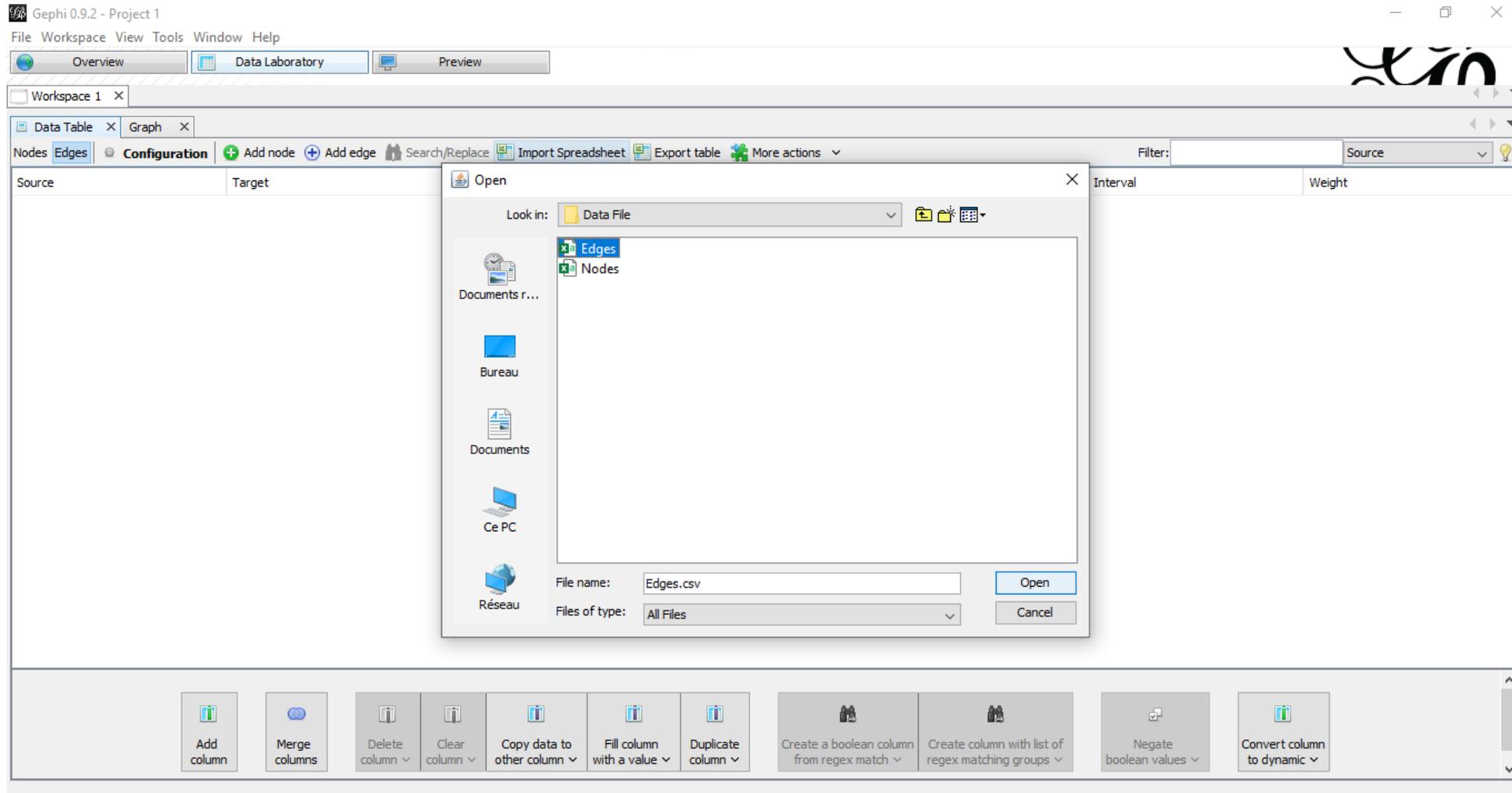
Data Table Graph

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

Id	Label	Interval	category	decision making
1	IRA		Research	Yes
2	CRDA		Administration	Yes
3	Forest		Administration	Yes
4	ICARDA		Research	No
5	UTAP		NGO	No
6	GDA Waara		NGO	Yes
7	GDA Dhaher		NGO	Yes
8	SMSA BK		Business	No
9	PRODEFIL		Administration	Yes
10	SMSA BG		Business	No
11	FIDA		development	No
12	local AU		Administration	Yes
13	Regional Au		Administration	Yes
14	CG BK		NGO	Yes
15	CG BG		NGO	Yes

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

# Import Data



# Import Data

Gephi 0.9.2 - Project 1

File Workspace View Tools Window Help

Overview Data Laboratory Preview

Workspace 1

Data Table Graph

Nodes Edges Configuration Add node Add edge

Source Target

Filter: Source

Weight

**Import report**

Source: Stream ImporterSpreadsheetCSV

Issues Report

No issue found during import

Graph Type: Directed [More options...](#)

**# of Nodes:** 15

**# of Edges:** 160

Dynamic Graph: no

Dynamic Attributes: no

Multi Graph: no

New workspace

**Append to existing workspace**

Append to existing workspace

OK Cancel

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

# Import Data

Gephi 0.9.2 - Project 1

File Workspace View Tools Window Help

Overview Data Laboratory Preview

Workspace 1

Data Table Graph

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

Source	Target	Type	Id	Label	Interval	Weight
1	2	Directed	0			1.0
1	3	Directed	1			1.0
1	4	Directed	2			1.0
1	5	Directed	3			1.0
1	9	Directed	4			1.0
1	11	Directed	5			1.0
1	12	Directed	6			1.0
1	13	Directed	7			1.0
2	1	Directed	8			1.0
2	3	Directed	9			1.0
2	4	Directed	10			1.0
2	5	Directed	11			1.0
2	6	Directed	12			1.0
2	7	Directed	13			1.0
2	8	Directed	14			1.0
2	9	Directed	15			1.0
2	10	Directed	16			1.0
2	11	Directed	17			1.0
2	12	Directed	18			1.0
2	13	Directed	19			1.0
2	14	Directed	20			1.0
2	15	Directed	21			1.0
3	1	Directed	22			1.0
3	2	Directed	23			1.0

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

# Overview

The screenshot displays the Gephi 0.9.2 software interface. The main window shows a network graph with approximately 15 nodes and numerous edges. The interface is divided into several panels:

- Appearance Panel (top left):** Contains tabs for 'Nodes' and 'Edges'. Under 'Nodes', there are options for 'Unique' and 'Partition Ranking'. A color swatch is set to '#c0c0c0'. An 'Apply' button is located at the bottom of this panel.
- Context Panel (bottom left):** Features a 'Layout' tab and a dropdown menu labeled '--Choose a layout'. A 'Run' button is present. The panel currently displays '<No Properties>'. A 'Presets... Reset' option is at the bottom.
- Statistics Panel (right):** Divided into 'Filters' and 'Statistics' tabs. It lists various network metrics with 'Run' buttons next to them:
  - Network Overview:** Average Degree, Avg. Weighted Degree, Network Diameter, Graph Density, HITS, Modularity, PageRank, Connected Components.
  - Node Overview:** Avg. Clustering Coefficient, Eigenvector Centrality.
  - Edge Overview:** Avg. Path Length.
  - Dynamic:** # Nodes, # Edges, Degree, Clustering Coefficient.

The top menu bar includes 'File', 'Workspace', 'View', 'Tools', 'Window', and 'Help'. Below the menu are tabs for 'Overview', 'Data Laboratory', and 'Preview'. The bottom status bar shows the font settings: 'Arial Bold, 32'.

# Preview

Gephi 0.9.2 - Project 1

File Workspace View Tools Window Help

Overview Data Laboratory Preview

Workspace 1 x

Preview Settings x

Presets

Default

Settings Manage renderers

Nodes

Border Width	1.0
Border Color	custom [0,0,0] ...
Opacity	100.0
Per-Node Opacity	<input type="checkbox"/>

Node Labels

Show Labels	<input type="checkbox"/>
Font	Arial 12 Plain ...
Proportional size	<input checked="" type="checkbox"/>
Color	custom [0,0,0] ...
Shorten label	<input type="checkbox"/>
Max characters	30
Outline size	0.0
Outline color	custom [255,255,255] ...
Outline opacity	80.0
Box	<input type="checkbox"/>
Box color	parent ...
Box opacity	100.0

Edges

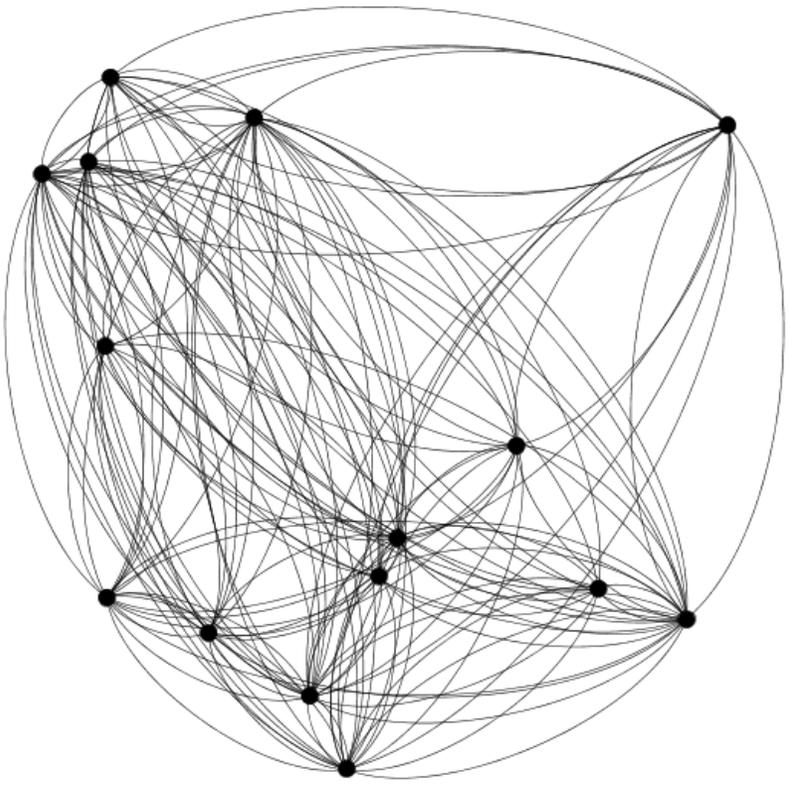
Show Edges	<input checked="" type="checkbox"/>
Thickness	1.0
Rescale weight	<input type="checkbox"/>
Min. rescaled weight	0.1

Preview ratio: 100%

Export: SVG/PDF/PNG

Refresh

Background Reset zoom - +



# Graph characteristics and layout options

Export results : graph and statistics table

# Export indicator's table

Gephi 0.9.2 - Project 1

File Workspace View Tools Window Help

Overview Data Laboratory Preview

Workspace 1

Data Table Graph

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

Id	Label	Interval	category	desicion ...	In-Deg...	Out-D...	Degree	Weighted I...	Weighted Ou...	Weighted...	Eccent...	Closeness C...	Harmonic Closenes...	Betweenness ...	Authority	Hub	Modularit...	PageR...	Clustering C...
1	IRA		Research	Yes	12	8	20	12.0	8.0	20.0	2.0	0.7	0.785714	1.316667	0.282311	0.202324	0	0.076566	0.818182
2	CRDA		Administ...	Yes	14	14	28	14.0	14.0	28.0	1.0	1.0	1.0	9.213095	0.30749	0.310357	1	0.089565	0.725275
3	Forest		Administ...	Yes	13	14	27	13.0	14.0	27.0	1.0	1.0	1.0	6.563095	0.296372	0.311344	1	0.077962	0.730769
4	ICARDA		Research	No	8	7	15	8.0	7.0	15.0	2.0	0.666667	0.75	0.4	0.194706	0.185262	0	0.060546	0.946429
5	UTAP		NGO	No	12	14	26	12.0	14.0	26.0	1.0	1.0	1.0	5.196429	0.279794	0.312816	0	0.071036	0.736264
6	GDA Wa...		NGO	Yes	8	10	18	8.0	10.0	18.0	2.0	0.777778	0.857143	0.25	0.205378	0.250959	0	0.050433	0.9
7	GDA Dh...		NGO	Yes	8	10	18	8.0	10.0	18.0	2.0	0.777778	0.857143	0.375	0.205378	0.250959	1	0.048479	0.845455
8	SMSA BK		Business	No	8	10	18	8.0	10.0	18.0	2.0	0.777778	0.857143	0.375	0.205378	0.250959	1	0.048479	0.845455
9	PRODEFIL		Administ...	Yes	13	14	27	13.0	14.0	27.0	1.0	1.0	1.0	6.563095	0.296372	0.311344	0	0.077962	0.730769
10	SMSA BG		Business	No	8	10	18	8.0	10.0	18.0	2.0	0.777778	0.857143	0.25	0.205378	0.250959	0	0.050433	0.9
11	FIDA		develop...	No	12	5	17	12.0	5.0	17.0	2.0	0.608696	0.678571	0.5	0.289242	0.124245	0	0.072394	0.840909
12	local AU		Administ...	Yes	14	14	28	14.0	14.0	28.0	1.0	1.0	1.0	9.213095	0.30749	0.310357	0	0.089565	0.725275
13	Regional...		Administ...	Yes	14	14	28	14.0	14.0	28.0	1.0	1.0	1.0	9.213095	0.30749	0.310357	1	0.089565	0.725275
14	CG BK		NGO	Yes	6	8	14	6.0	8.0	14.0	2.0	0.7	0.785714	0.0	0.165713	0.195826	1	0.040102	1.0
15	CG BG		NGO	Yes	10	8	18	10.0	8.0	18.0	2.0	0.7	0.785714	0.571429	0.254833	0.195826	1	0.056911	0.911111

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

# Export indicator's table

Gephi 0.9.2 - Project 1

File Workspace View Tools Window Help

Overview Data Laboratory Preview

Workspace 1

Data Table Graph

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

Id	Label	Interval	category	decision ...	In-Deg...	Out-D...	Authority	Hub	Modularit...	PageR...	Clustering C...
1	IRA		Research	Yes	12	8	0.282311	0.202324	0	0.076566	0.818182
2	CRDA		Administ...	Yes	14	14	0.30749	0.310357	1	0.089565	0.725275
3	Forest		Administ...	Yes	13	14	0.296372	0.311344	1	0.077962	0.730769
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5	UTAP		NGO	No	12	14	0.279794	0.312816	0	0.071036	0.736264
6	GDA Wa...		NGO	Yes	8	10	0.205378	0.250959	0	0.050433	0.9
7	GDA Dh...		NGO	Yes	8	10	0.205378	0.250959	1	0.048479	0.845455
8	SMSA BK		Business	No	8	10	0.205378	0.250959	1	0.048479	0.845455
9	PRODEFIL		Administ...	Yes	13	14	0.296372	0.311344	0	0.077962	0.730769
10	SMSA BG		Business	No	8	10	0.205378	0.250959	0	0.050433	0.9
11	FIDA		develop...	No	12	5	0.289242	0.124245	0	0.072394	0.840909
12	local AU		Administ...	Yes	14	14	0.30749	0.310357	0	0.089565	0.725275
13	Regional...		Administ...	Yes	14	14	0.30749	0.310357	1	0.089565	0.725275
14	CG BK		NGO	Yes	6	8	0.165713	0.195826	1	0.040102	1.0
15	CG BG		NGO	Yes	10	8	0.254833	0.195826	1	0.056911	0.911111

Export dialog box:

Save in: Results

File name: data file 2.csv

Files of type: Spreadsheet Files (\*.csv \*.tsv)

Graph:  Full The complete graph is exported  
 Visible only Only the current visualized graph is exported

Buttons: Save, Cancel, Options...

Bottom toolbar: 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

# Export indicator's table

Gephi 0.9.2 - Project 1

File Workspace View Tools Window Help

Overview Data Laboratory Preview

Workspace 1

Data Table Graph

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

Id	Label	Interval	category	decision ...	In-Deg...	Out-D...
1	IRA		Research	Yes	12	8
2	CRDA		Administ...	Yes	14	14
3	Forest		Administ...	Yes	13	14
4	ICARDA		Research	No	8	7
5	UTAP		NGO	No	12	14
6	GDA Wa...		NGO	Yes	8	10
7	GDA Dh...		NGO	Yes	8	10
8	SMSA BK		Business	No	8	10
9	PRODEFIL		Administ...	Yes	13	14
10	SMSA BG		Business	No	8	10
11	FIDA		develop...	No	12	5
12	local AU		Administ...	Yes	14	14
13	Regional...		Administ...	Yes	14	14
14	CG BK		NGO	Yes	6	8
15	CG BG		NGO	Yes	10	8

Export

Options Spreadsheet

Save in: Results

Table: Nodes

Field separator: Semicolon

Columns: Id, Label, Interval, category, decision making, In-Degree, Out-Degree, Degree

File name:

Files of type:

Graph:  Full The complete graph is exported  Visible only Only the current visualized graph is exported

Save Cancel Options... OK Cancel

Authority	Hub	Modularit...	PageR...	Clustering C...
0.282311	0.202324	0	0.076566	0.818182
0.30749	0.310357	1	0.089565	0.725275
0.296372	0.311344	1	0.077962	0.730769
0.194706	0.185262	0	0.060546	0.946429
0.279794	0.312816	0	0.071036	0.736264
0.205378	0.250959	0	0.050433	0.9
0.205378	0.250959	1	0.048479	0.845455
0.205378	0.250959	1	0.048479	0.845455
0.296372	0.311344	0	0.077962	0.730769
0.205378	0.250959	0	0.050433	0.9
0.289242	0.124245	0	0.072394	0.840909
0.30749	0.310357	0	0.089565	0.725275
0.30749	0.310357	1	0.089565	0.725275
0.165713	0.195826	1	0.040102	1.0
0.254833	0.195826	1	0.056911	0.911111

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

# Export indicator's table

The screenshot shows an Excel spreadsheet with the following data:

Id	Label	timeset	category	desicion mal	indegree	outdegree	Degree	weighted in	weighted ou	Weighted De	Eccentricity	closnesscent	harmonicclo	betweenness	Authority	Hub
1	IRA		Research	Yes	12	8	20	12	8	20	2	0.7	0.785714	1.316667	0.282311	0.2023
2	CRDA		Administrati	Yes	14	14	28	14	14	28	1	1	1	9.213095	0.30749	0.3103
3	Forest		Administrati	Yes	13	14	27	13	14	27	1	1	1	6.563095	0.296372	0.3113
4	ICARDA		Research	No	8	7	15	8	7	15	2	0.666667	0.75	0.4	0.194706	0.1852
5	UTAP		NGO	No	12	14	26	12	14	26	1	1	1	5.196429	0.279794	0.3128
6	GDA Waara		NGO	Yes	8	10	18	8	10	18	2	0.777778	0.857143	0.25	0.205378	0.2509
7	GDA Dhaher		NGO	Yes	8	10	18	8	10	18	2	0.777778	0.857143	0.375	0.205378	0.2509
8	SMSA BK		Business	No	8	10	18	8	10	18	2	0.777778	0.857143	0.375	0.205378	0.2509
9	PRODEFIL		Administrati	Yes	13	14	27	13	14	27	1	1	1	6.563095	0.296372	0.3113
10	SMSA BG		Business	No	8	10	18	8	10	18	2	0.777778	0.857143	0.25	0.205378	0.2509
11	FIDA		developmen	No	12	5	17	12	5	17	2	0.608696	0.678571	0.5	0.289242	0.1242
12	local AU		Administrati	Yes	14	14	28	14	14	28	1	1	1	9.213095	0.30749	0.3103
13	Regional Au		Administrati	Yes	14	14	28	14	14	28	1	1	1	9.213095	0.30749	0.3103
14	CG BK		NGO	Yes	6	8	14	6	8	14	2	0.7	0.785714	0	0.165713	0.1958
15	CG BG		NGO	Yes	10	8	18	10	8	18	2	0.7	0.785714	0.571429	0.254833	0.1958

# Export Graphic

The screenshot displays the Gephi 0.9.2 interface. The 'File' menu is open, with the 'Export' option selected, which has opened a sub-menu with the following options:

- Graph file...
- SVG/PDF/PNG file...
- Sigma.js template...

The main workspace shows a network graph with approximately 15 nodes and many edges. The right-hand panel displays various network statistics:

Category	Statistic	Value	Action
Network Overview	Average Degree	10.667	Run
	Avg. Weighted Degree	10.667	Run
	Network Diameter	2	Run
	Graph Density	0.762	Run
	HITS		Run
	Modularity	0.02	Run
	PageRank		Run
Connected Components		Run	
Node Overview	Avg. Clustering Coefficient	0.825	Run
	Eigenvector Centrality		Run
Edge Overview	Avg. Path Length	1.238	Run
Dynamic	# Nodes		Run
	# Edges		Run
	Degree		Run
	Clustering Coefficient		Run

The bottom status bar shows the font is set to 'Arial Bold, 32'.

# Export Graphic

The screenshot displays the Gephi 0.9.2 software interface. The 'File' menu is open, with the 'Export' option selected, which has opened a sub-menu containing 'Graph file...', 'SVG/PDF/PNG file...', and 'Sigma.js template...'. The main workspace shows a network graph with approximately 15 nodes and many edges. On the right side, the 'Statistics' panel is visible, showing various network metrics.

Category	Metric	Value	Action
Network Overview	Average Degree	10.667	Run
	Avg. Weighted Degree	10.667	Run
	Network Diameter	2	Run
	Graph Density	0.762	Run
	HITS		Run
	Modularity	0.02	Run
	PageRank		Run
Node Overview	Connected Components		Run
	Avg. Clustering Coefficient	0.825	Run
	Eigenvector Centrality		Run
Edge Overview	Avg. Path Length	1.238	Run
Dynamic	# Nodes		Run
	# Edges		Run
	Degree		Run
	Clustering Coefficient		Run

# Export Graphic

The screenshot displays the Gephi 0.9.2 interface with an 'Export' dialog box open. The dialog is configured to save a file named 'Results 2.png' in the 'Results' folder. The file type is set to 'PNG Files (\*.png)'. The background shows a network graph with several nodes and edges, and various toolbars and panels are visible.

**Export Dialog Configuration:**

- Save in: Results
- File name: Results 2.png
- Files of type: PNG Files (\*.png)

**Network Graph Statistics (Right Panel):**

Category	Statistic	Value	Action
Network Overview	Average Degree	10.667	Run
	Avg. Weighted Degree	10.667	Run
	Network Diameter	2	Run
	Graph Density	0.762	Run
	HITS		Run
	Modularity	0.02	Run
Node Overview	PageRank		Run
	Connected Components		Run
	Avg. Clustering Coefficient	0.825	Run
Edge Overview	Eigenvector Centrality		Run
	Avg. Path Length	1.238	Run
Dynamic	# Nodes		Run
	# Edges		Run
	Degree		Run
	Clustering Coefficient		Run

Thank you