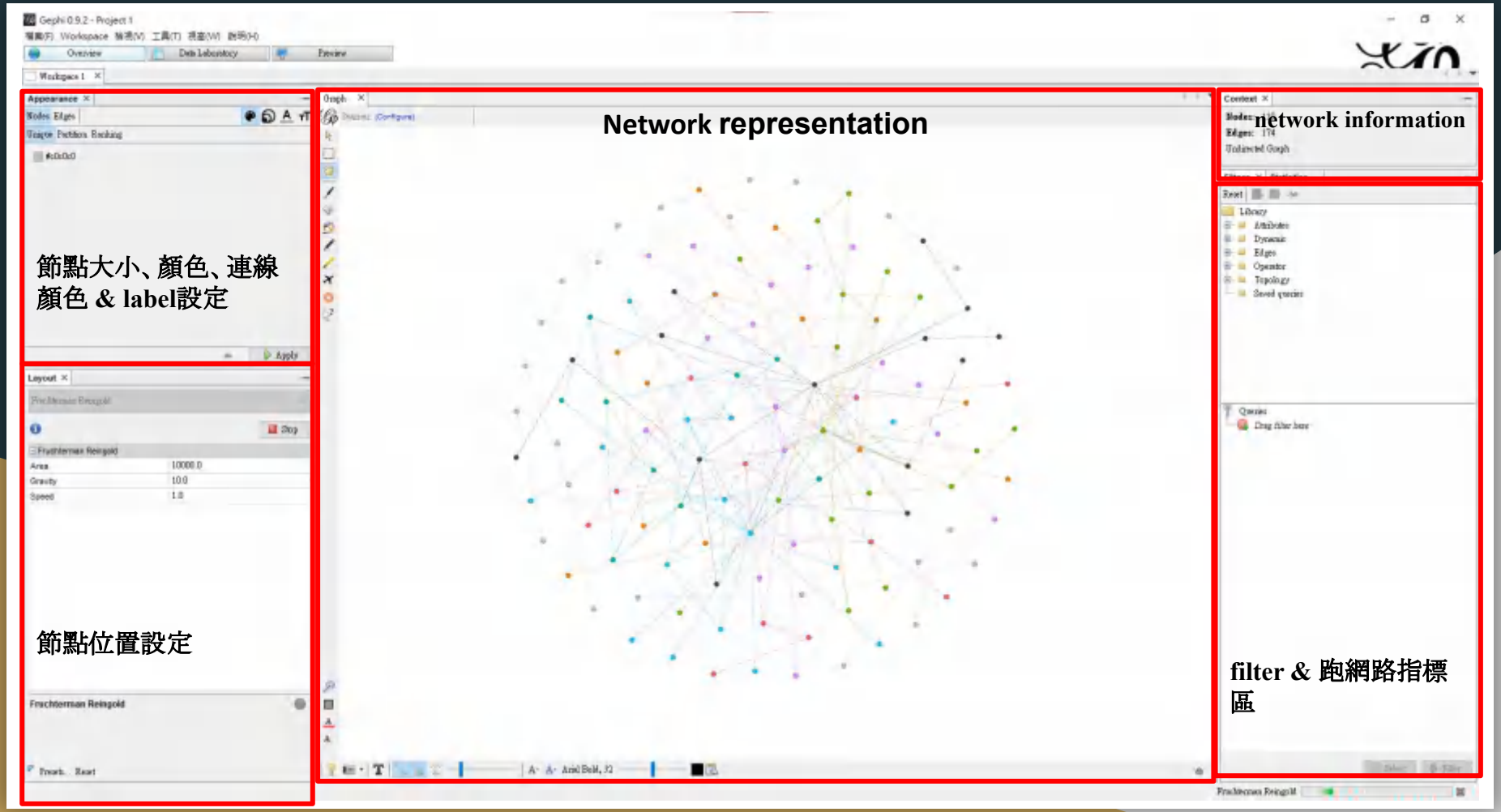
Graph virtualization tools

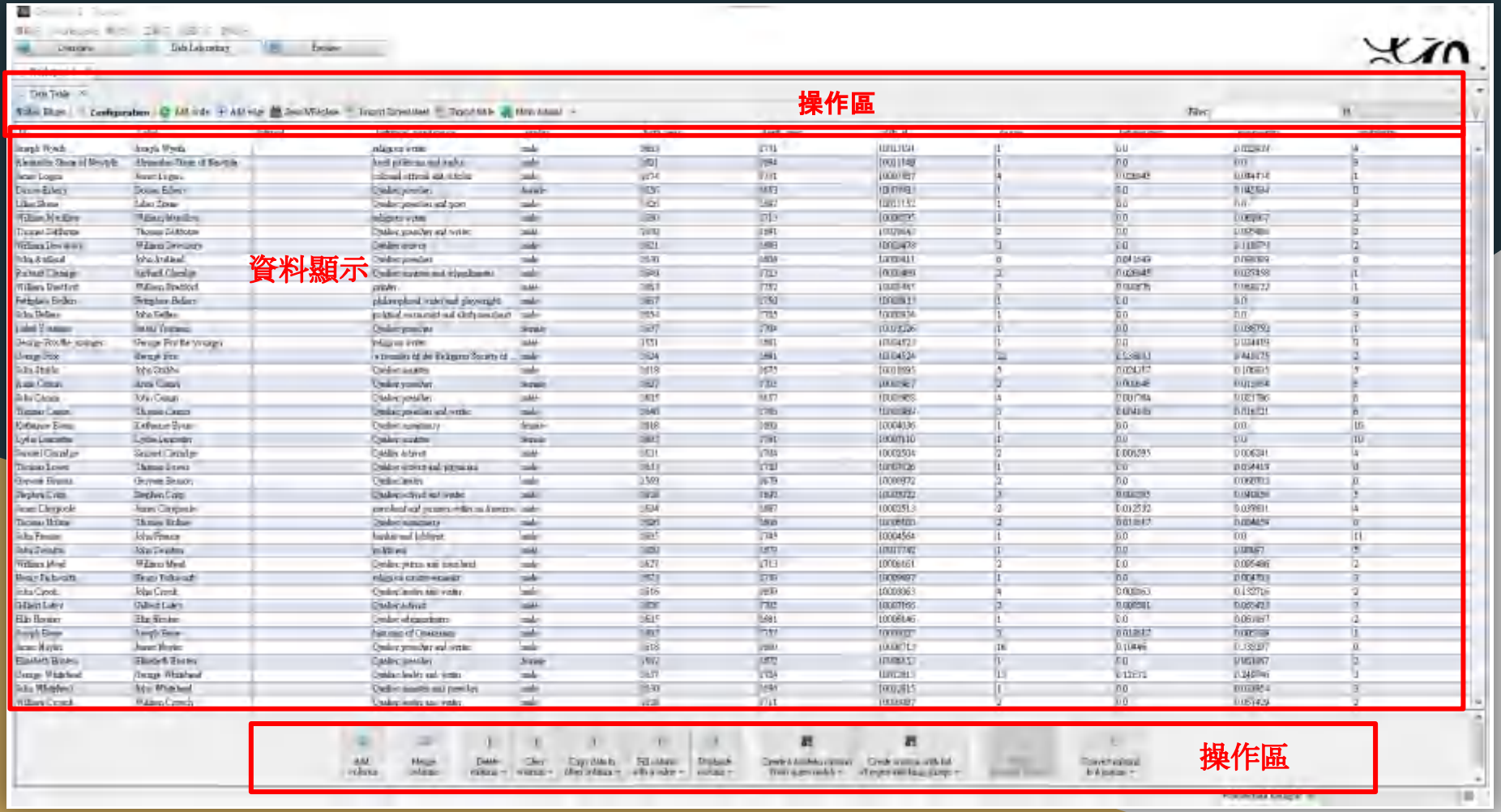
1. Gephi


Gephi
makes graphs handy
Download Blog Wiki Ask a question Support Bug tracker
Home Features Learn Develop Plugins
The Open Graph Viz Platform
Gephi is the leading visualization and exploration software for all kinds of graphs and networks. Gephi is open-source and free.
Runs on Windows, Mac OS X and Linux.
Learn More on Gephi Platform »
Download FREE
Release Notes | System Requirements
Features
Quick start
Screenshots
Videos

1-1. 介面(Overview)


Network representation
network information
節點大小、顏色、連線顏色 & label設定
節點位置設定
filter & 跑網路指標區

1-1. 介面(Data Laboratory)


操作區
資料顯示
操作區

1-1. 介面(Preview)


輸出預覽
設定區

1-2. 匯入資料

Input format:

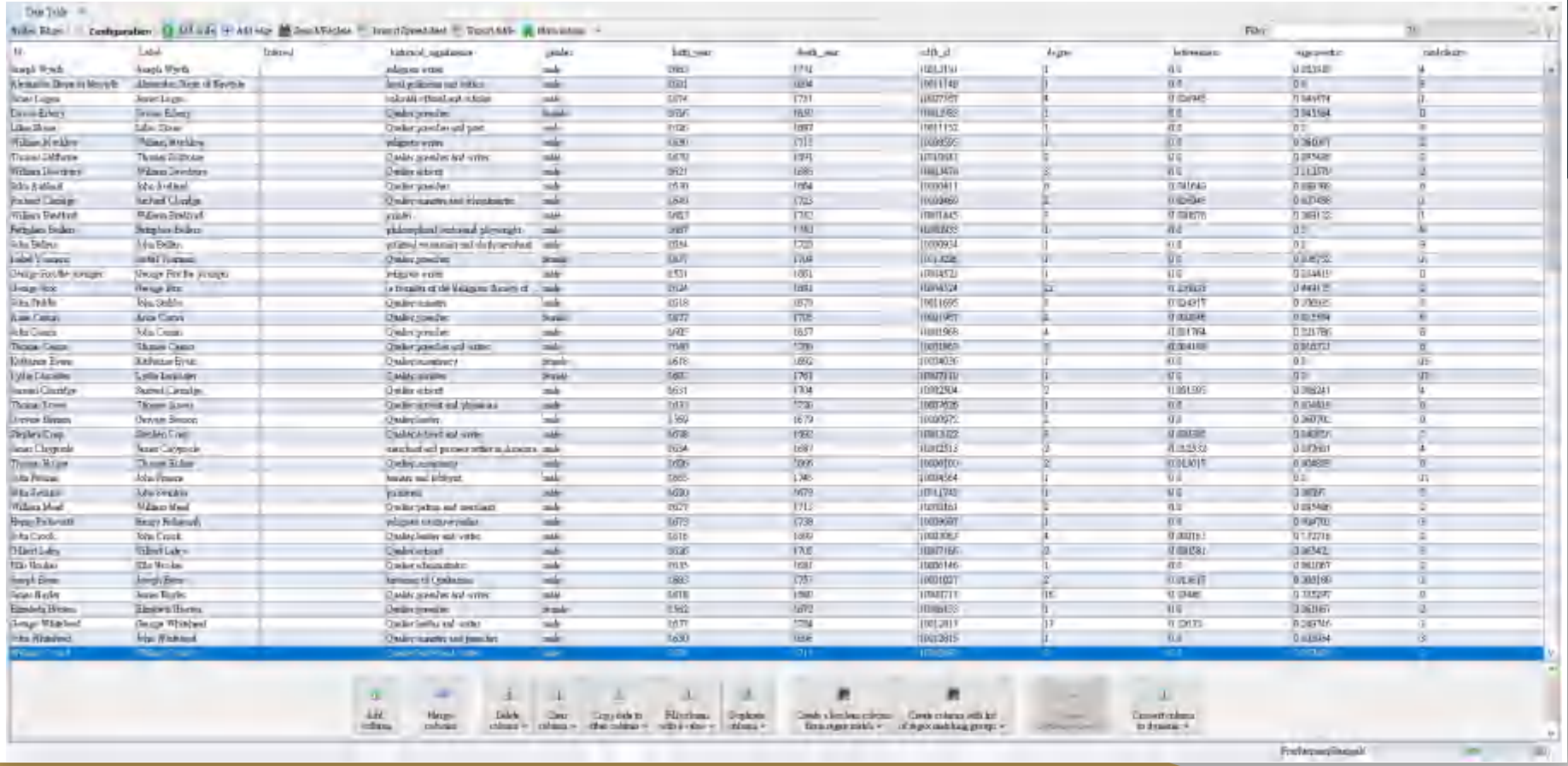
GraphViz(.dot), Graphlet(.gml), GUESS(.gdf), LEDA(.gml), NetworkX(.graphml, .net), NodeXL(.graphml, .net), Pajek(.net, .gml), Sonivis(.graphml), Tulip(.tlp, .dot), UCINET(.dl), yEd(.gml), Gephi (.gexf), Edge list(.csv), databases

1-2. 匯入資料

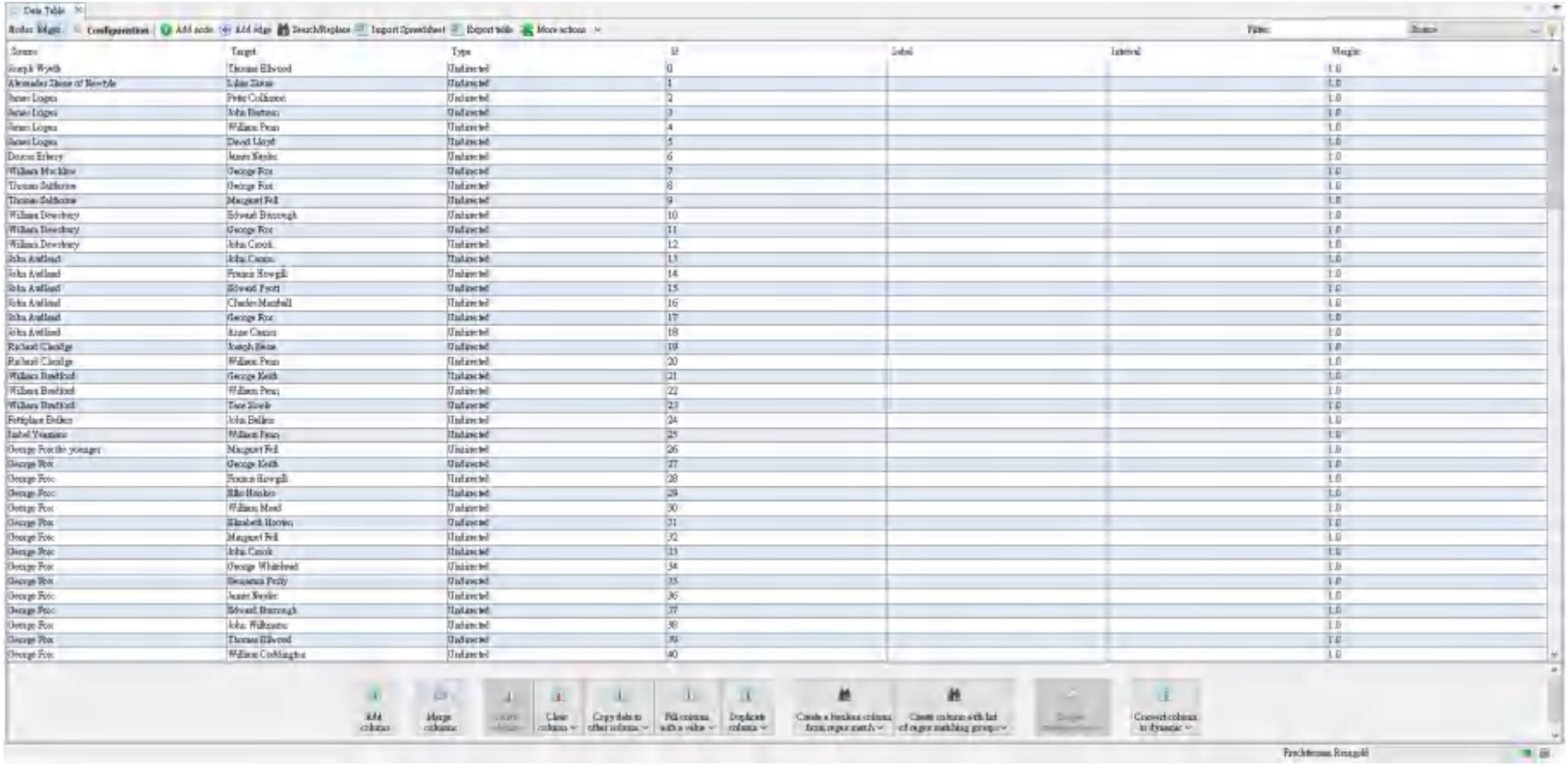
a. Node data:
   i. id(必須): must be unique

b. Edge data:
   i. source(必須): 連線起點id
   ii. target(必須): 連線端點id

Node data

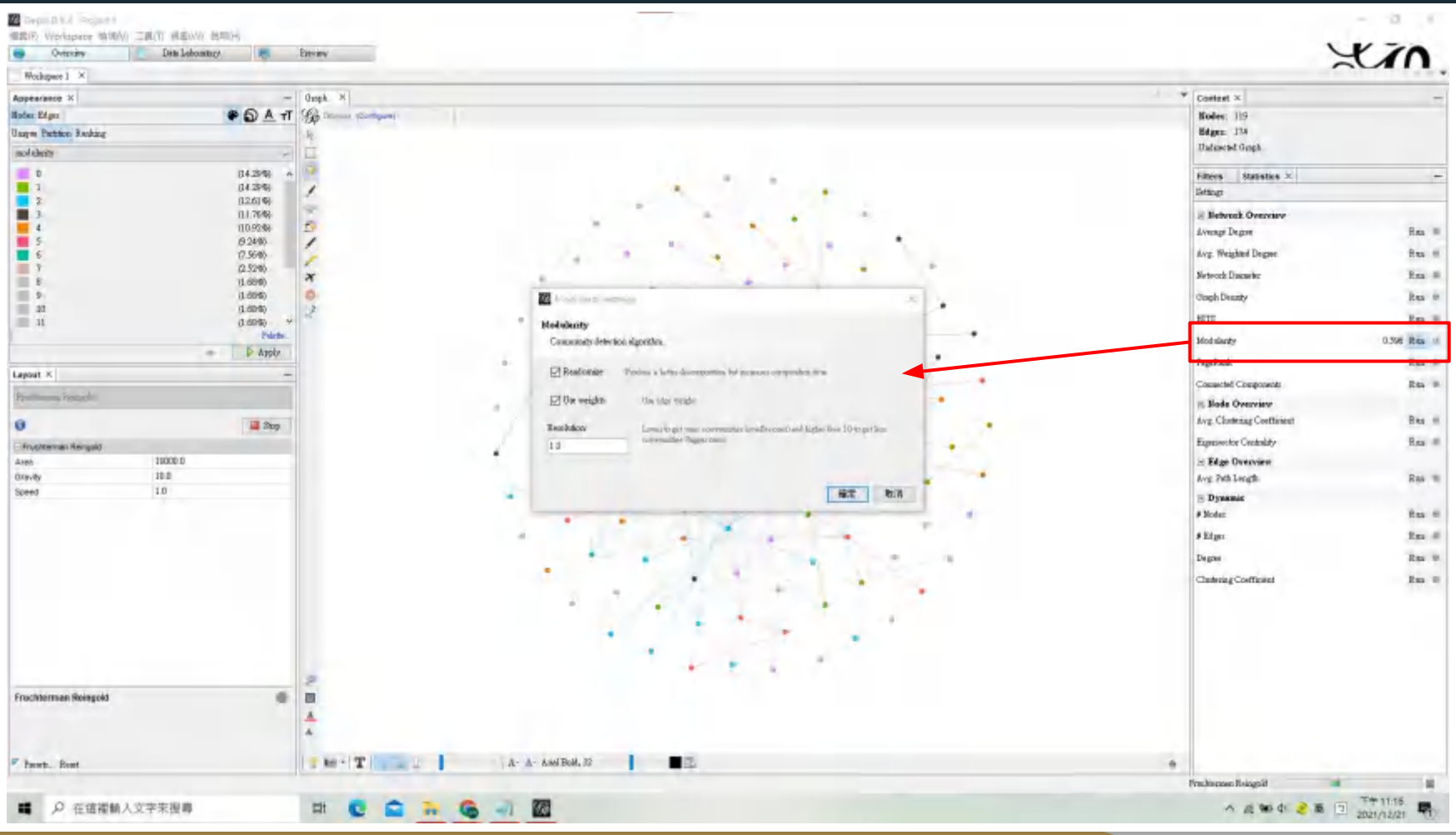


Edge data



Source	Target	Type	Id	Label	Interval	Weight
Joseph Wyeth	Thomas Ellwood	Undirected	0			1.0
Alexander Shone of Newtyle	John Simm	Undirected	1			1.0
James Logan	Peter Collinson	Undirected	2			1.0
James Logan	John Bartram	Undirected	3			1.0
James Logan	William Penn	Undirected	4			1.0
James Logan	David Lloyd	Undirected	5			1.0
Dorcas Erbery	James Naylor	Undirected	6			1.0
William Mucklow	George Fox	Undirected	7			1.0
Thomas Salthorpe	George Fox	Undirected	8			1.0
Thomas Salthorpe	Margaret Fell	Undirected	9			1.0
William Dewsbury	Edward Burrough	Undirected	10			1.0
William Dewsbury	George Fox	Undirected	11			1.0
William Dewsbury	John Cotoll	Undirected	12			1.0
John Ashland	John Camm	Undirected	13			1.0
John Ashland	Francis Howgill	Undirected	14			1.0
John Ashland	Edward Pyott	Undirected	15			1.0
John Ashland	Charles Marshall	Undirected	16			1.0
John Ashland	George Fox	Undirected	17			1.0
John Ashland	Anne Camm	Undirected	18			1.0
Richard Claridge	Joseph Bevan	Undirected	19			1.0
Richard Claridge	William Penn	Undirected	20			1.0
William Bradford	George Keith	Undirected	21			1.0
William Bradford	William Penn	Undirected	22			1.0
William Bradford	Thos Steele	Undirected	23			1.0
Fothergian Brothers	John Bellers	Undirected	24			1.0
Isabel Yeamans	William Penn	Undirected	25			1.0
George Fox the younger	Margaret Fell	Undirected	26			1.0
George Fox	George Keith	Undirected	27			1.0
George Fox	Francis Howgill	Undirected	28			1.0
George Fox	Ellis Hookes	Undirected	29			1.0
George Fox	William Mead	Undirected	30			1.0
George Fox	Elizabeth Hooton	Undirected	31			1.0
George Fox	Margaret Fell	Undirected	32			1.0
George Fox	John Cotoll	Undirected	33			1.0
George Fox	George Whitehead	Undirected	34			1.0
George Fox	Benjamin Petty	Undirected	35			1.0
George Fox	James Naylor	Undirected	36			1.0
George Fox	Edward Burrough	Undirected	37			1.0
George Fox	John Wilkinson	Undirected	38			1.0
George Fox	Thomas Ellwood	Undirected	39			1.0
George Fox	William Coddington	Undirected	40			1.0

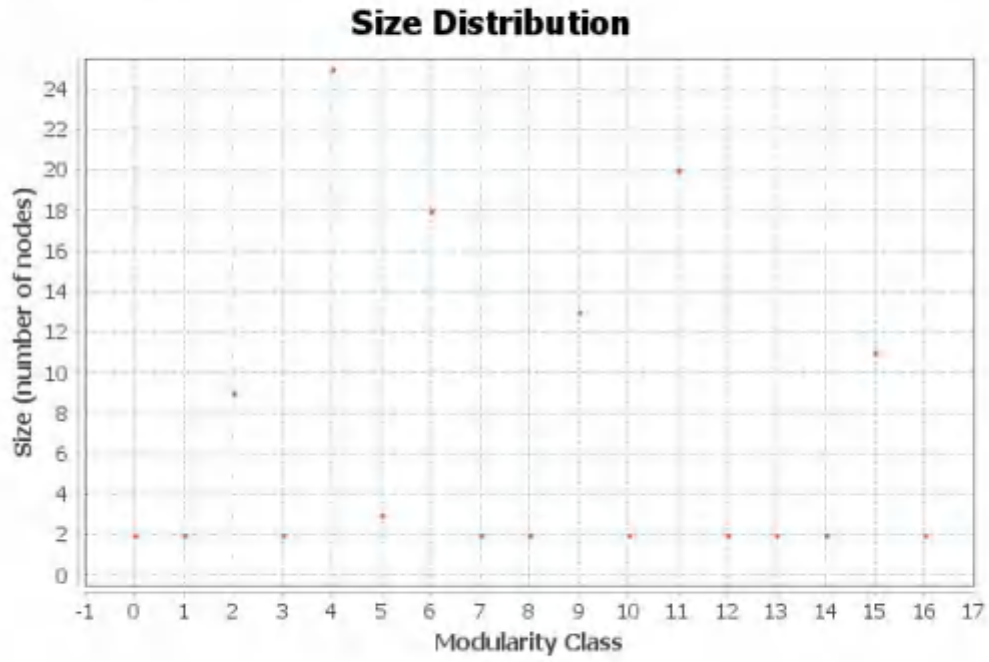
1-3. 分析(Modularity)


Modularity
Community detection algorithm.
Randomize
Use weight
Resolution
1.0
Modularity 0.598

HTML Report

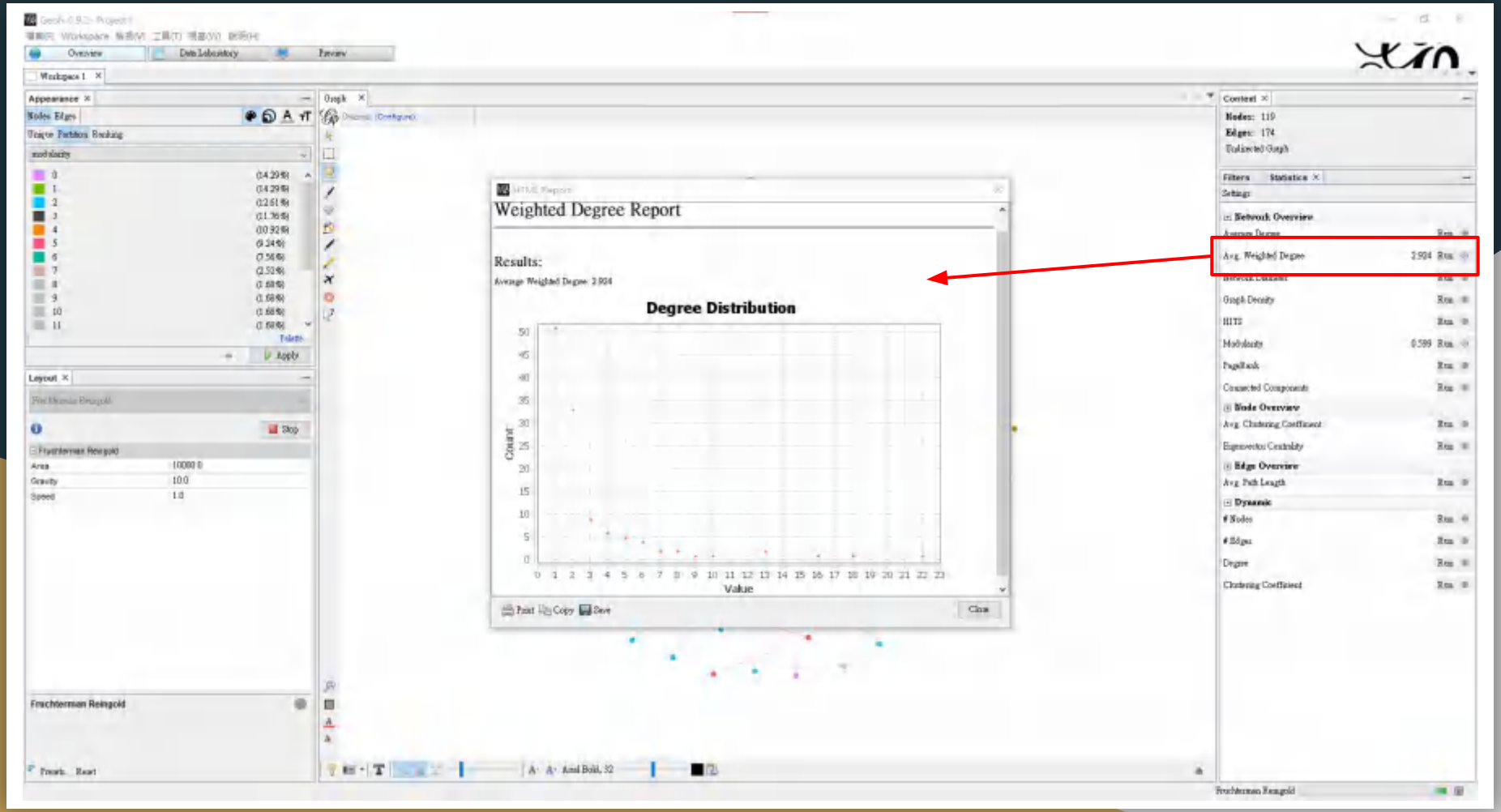
Results:

Modularity: 0.599
Modularity with resolution: 0.599
Number of Communities: 17

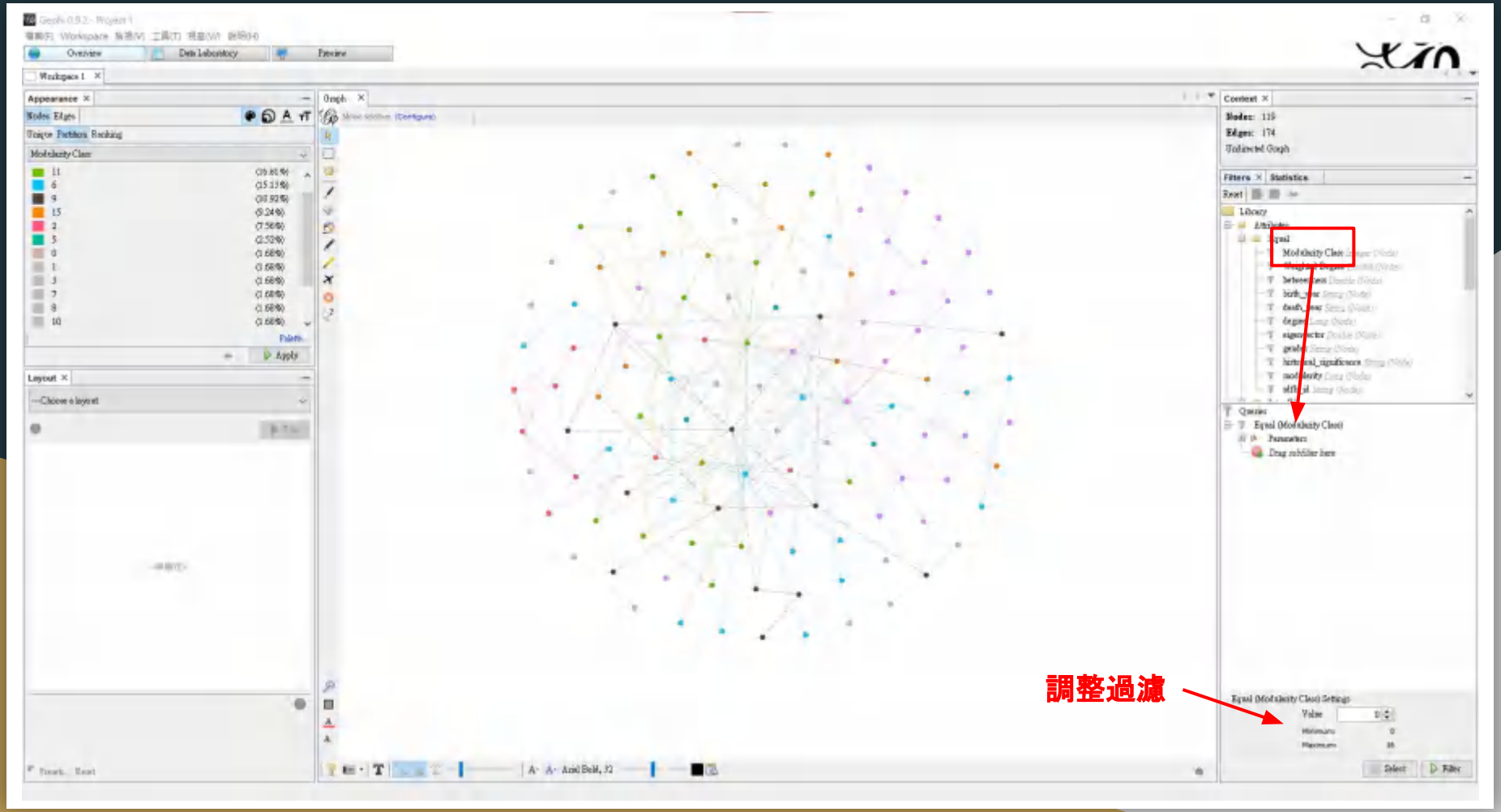


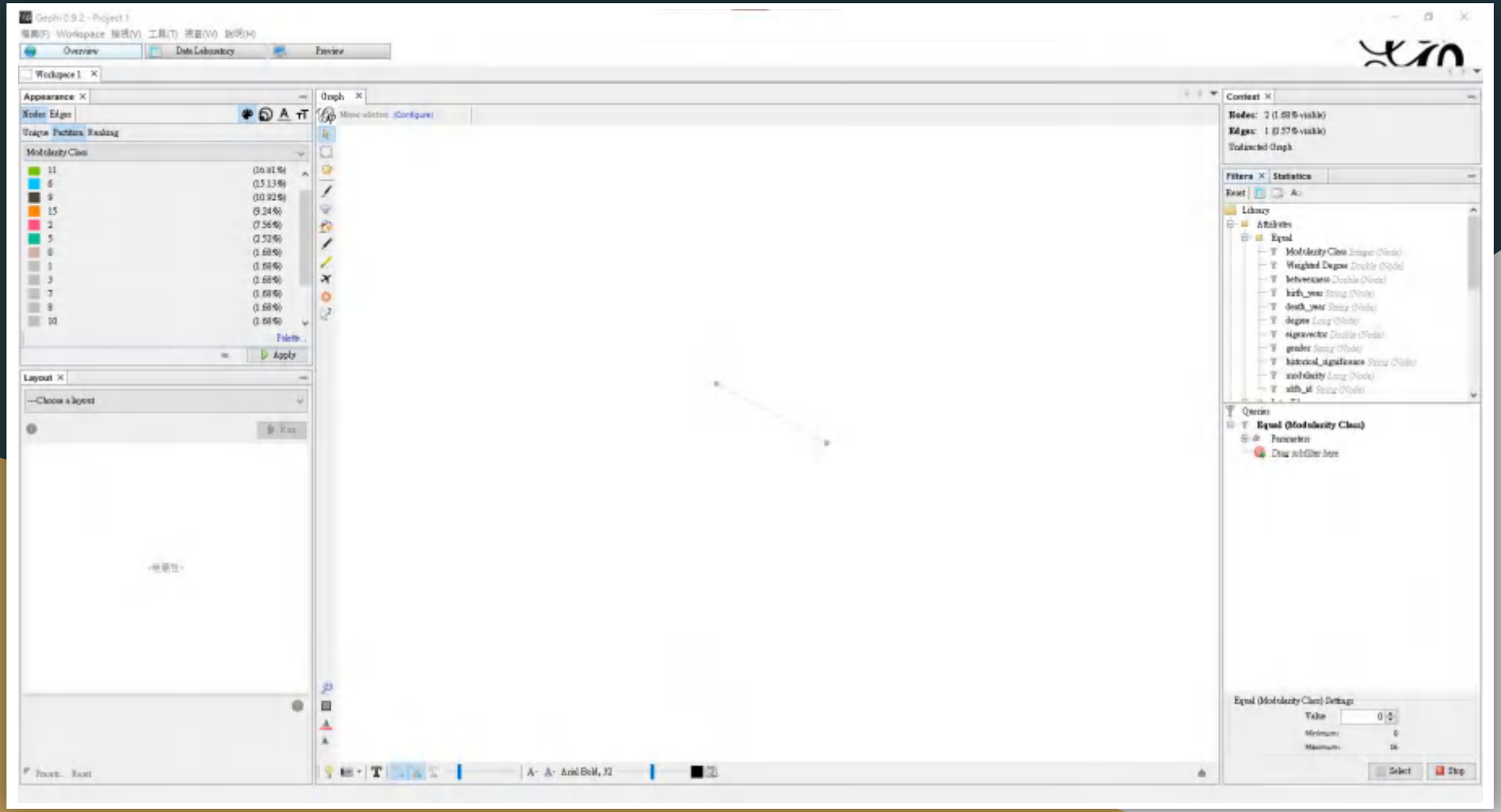
Print Copy Save Close

1-3. 分析(Avg. Weight Degree)

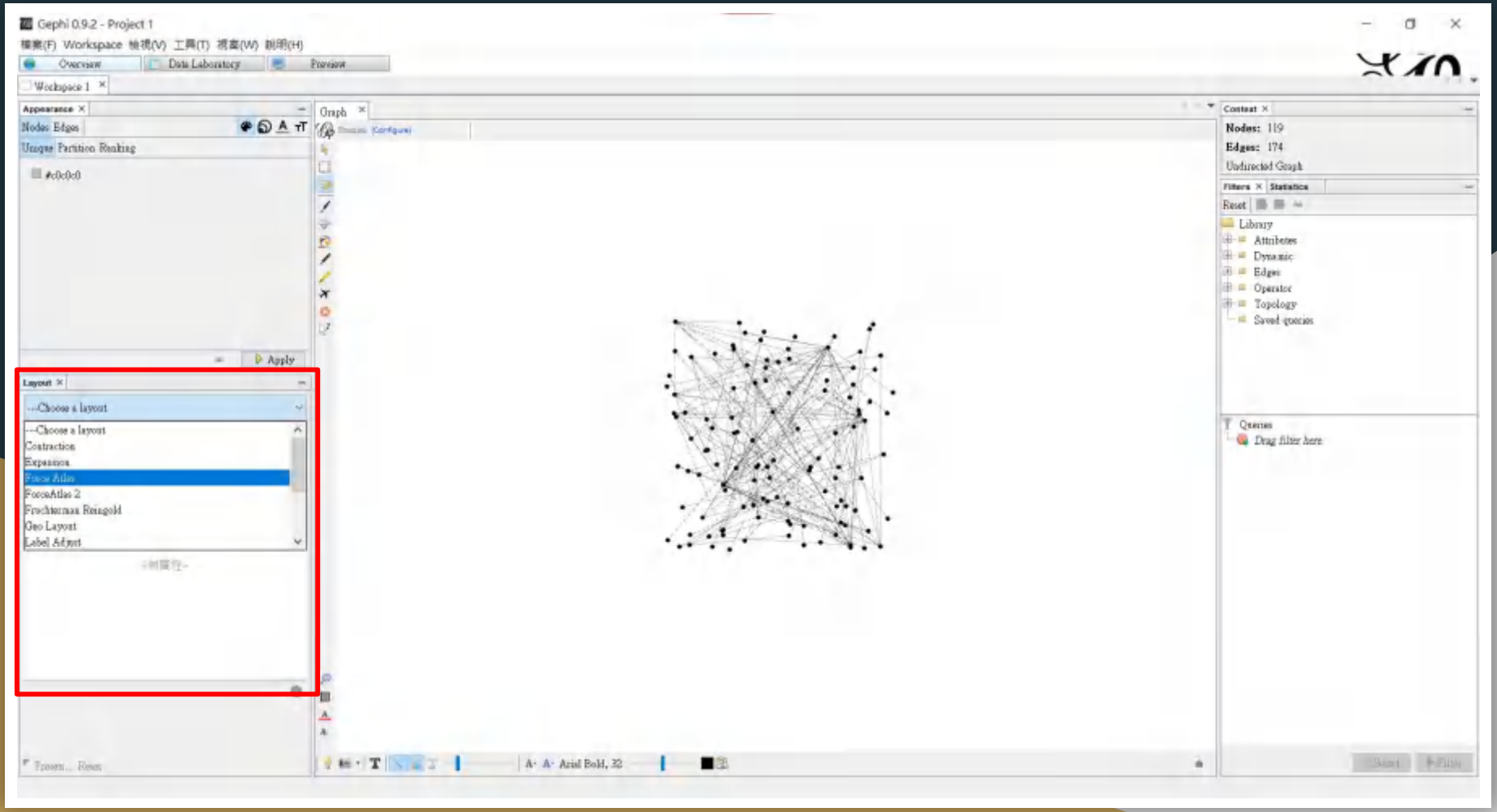

Weighted Degree Report
Results:
Average Weighted Degree: 2.924
Degree Distribution
Count
Value
Print
Copy
Save
Close
Avg. Weighted Degree 2.924
Nodes: 119
Edges: 174
Undirected Graph
Network Overview
Graph Density
Modularity 0.599
PageRank
Connected Components
Node Overview
Avg. Clustering Coefficient
Eigenvector Centrality
Edge Overview
Avg. Path Length
Dynamic
Nodes
Edges
Degree
Clustering Coefficient
Frachterman Reingold

1-4. 過濾

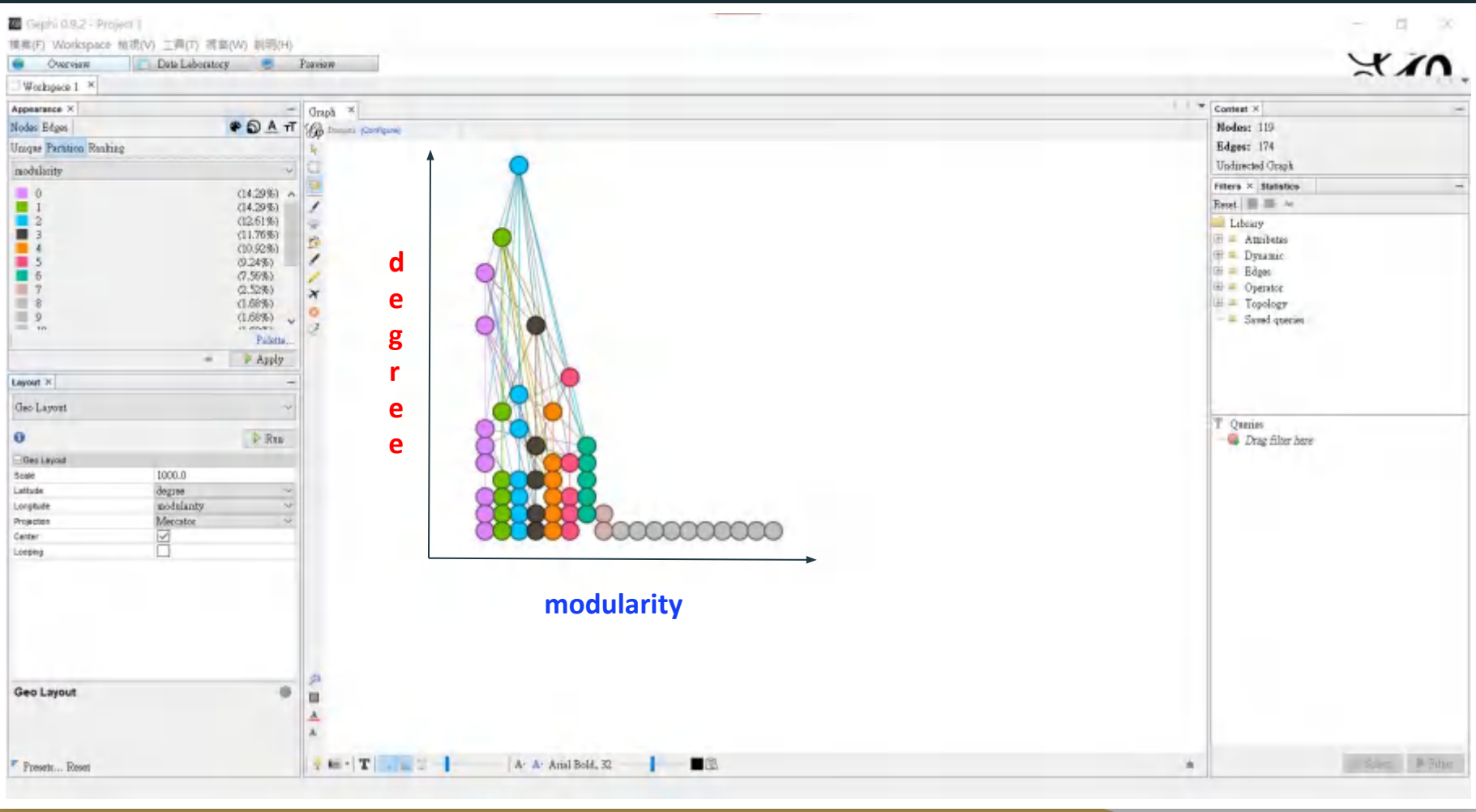

調整過濾


Gephi 0.9.2 - Project 1
Overview
Data Laboratory
Preview
Workspace 1
Appearance
Nodes
Edges
Modularity Class
Apply
Layout
--Choose a layout
Graph
Context
Nodes: 2 (1.68% visible)
Edges: 1 (0.57% visible)
Undirected Graph
Filters
Statistics
Reset
Library
Attributes
Equal
Modularity Class
Weighted Degree
betweenness
birth_year
death_year
degree
eigenvector
gender
historical_significance
modularity
Queries
Equal (Modularity Class)
Parameters
Drag subfilter here
Equal (Modularity Class) Settings
Value
Minimum:
Maximum:
Select
Stop

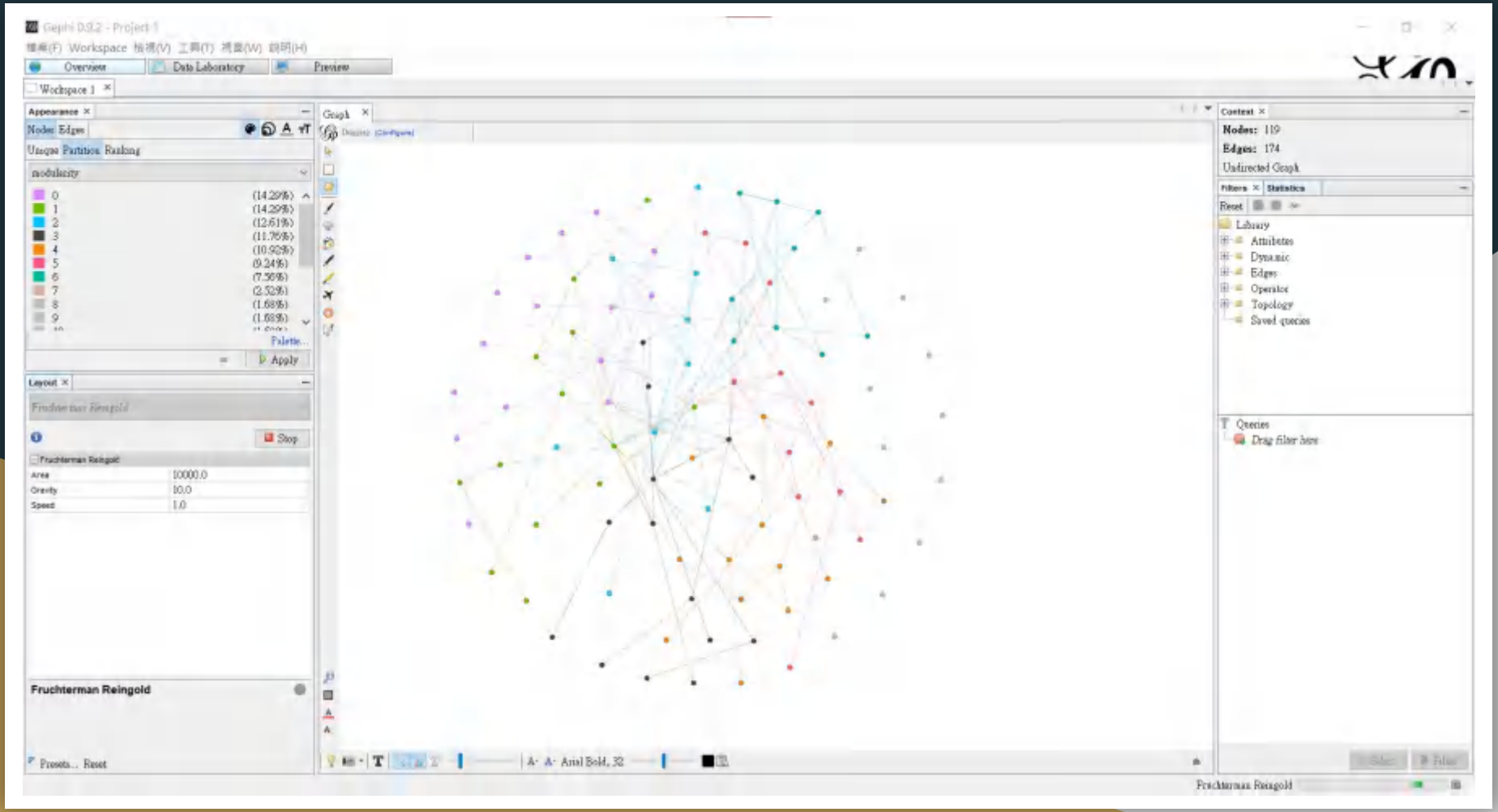
1-5. Layout


Gephi 0.9.2 - Project 1
Overview
Data Laboratory
Preview
Workspace 1
Appearance
Nodes Edges
Unique Partition Ranking
Apply
Layout
---Choose a layout
---Choose a layout
Contraction
Expansion
Force Atlas
ForceAtlas 2
Fruchterman Reingold
Geo Layout
Label Adjust
Graph
Context
Nodes: 119
Edges: 174
Undirected Graph
Filters
Statistics
Reset
Library
Attributes
Dynamic
Edges
Operator
Topology
Saved queries
Queries
Drag filter here

1-5. Layout(Geo layout)


Gephi 0.9.2 - Project 1
Overview
Data Laboratory
Preview
Workspace 1
Appearance
Nodes Edges
Unique Partition Ranking
modularity
0 (14.29%)
1 (14.29%)
2 (12.61%)
3 (11.76%)
4 (10.92%)
5 (9.24%)
6 (7.56%)
7 (2.52%)
8 (1.68%)
9 (1.68%)
Palette...
Apply
Layout
Geo Layout
Run
Geo Layout
Scale 1000.0
Latitude degree
Longitude modularity
Projection Mercator
Center
Loosing
Geo Layout
Presets... Reset
Graph
degree
modularity
Arial Bold, 32
Context
Nodes: 119
Edges: 174
Undirected Graph
Filters
Statistics
Reset
Library
Attributes
Dynamic
Edges
Operator
Topology
Saved queries
Queries
Drag filter here

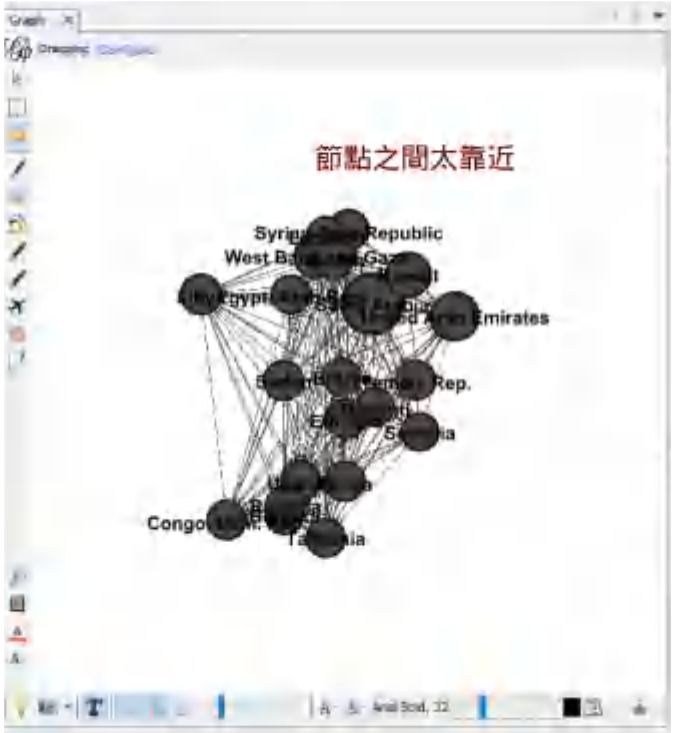
1-5. Layout(Fruchterman Reingold)


Gephi 0.9.2 - Project 1
Overview
Data Laboratory
Preview
Workspace 1
Appearance
Nodes
Edges
Unique
Partition
Ranking
modularity
0 (14.29%)
1 (14.29%)
2 (12.61%)
3 (11.76%)
4 (10.92%)
5 (9.24%)
6 (7.56%)
7 (2.52%)
8 (1.68%)
9 (1.68%)
Palette...
Apply
Layout
Fruchterman Reingold
Stop
Area 10000.0
Gravity 10.0
Speed 1.0
Fruchterman Reingold
Presets... Reset
Graph
Arial Bold, 32
Context
Nodes: 119
Edges: 174
Undirected Graph
Filters
Statistics
Reset
Library
Attributes
Dynamic
Edges
Operator
Topology
Saved queries
Queries
Drag filter here
Fruchterman Reingold

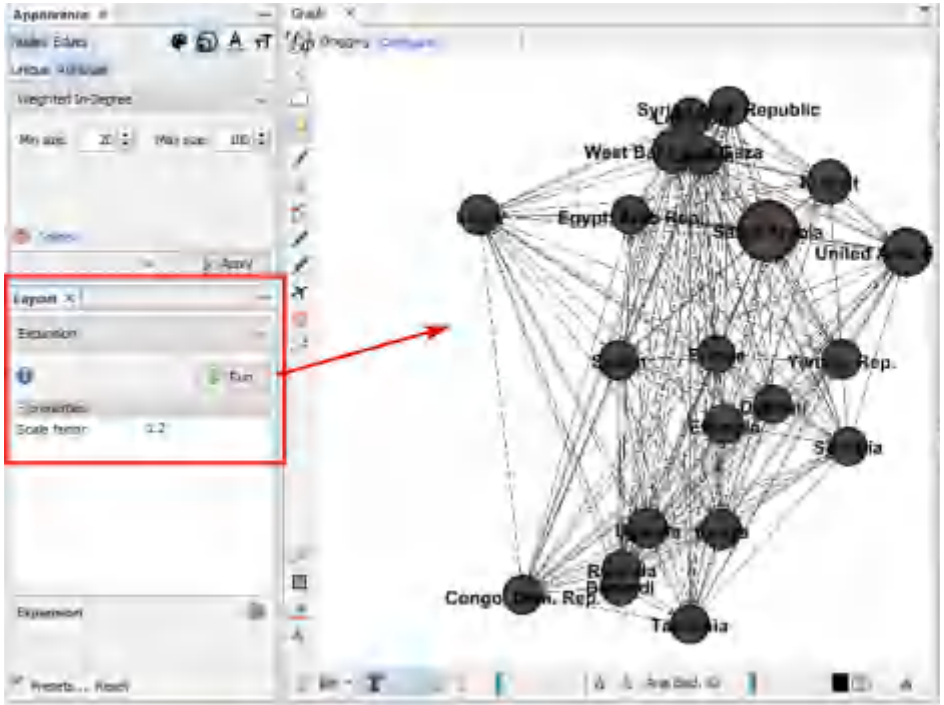
1-5. Layout(Expansion)

使用時機：layout的結果出現節點太過靠近的情況

Before

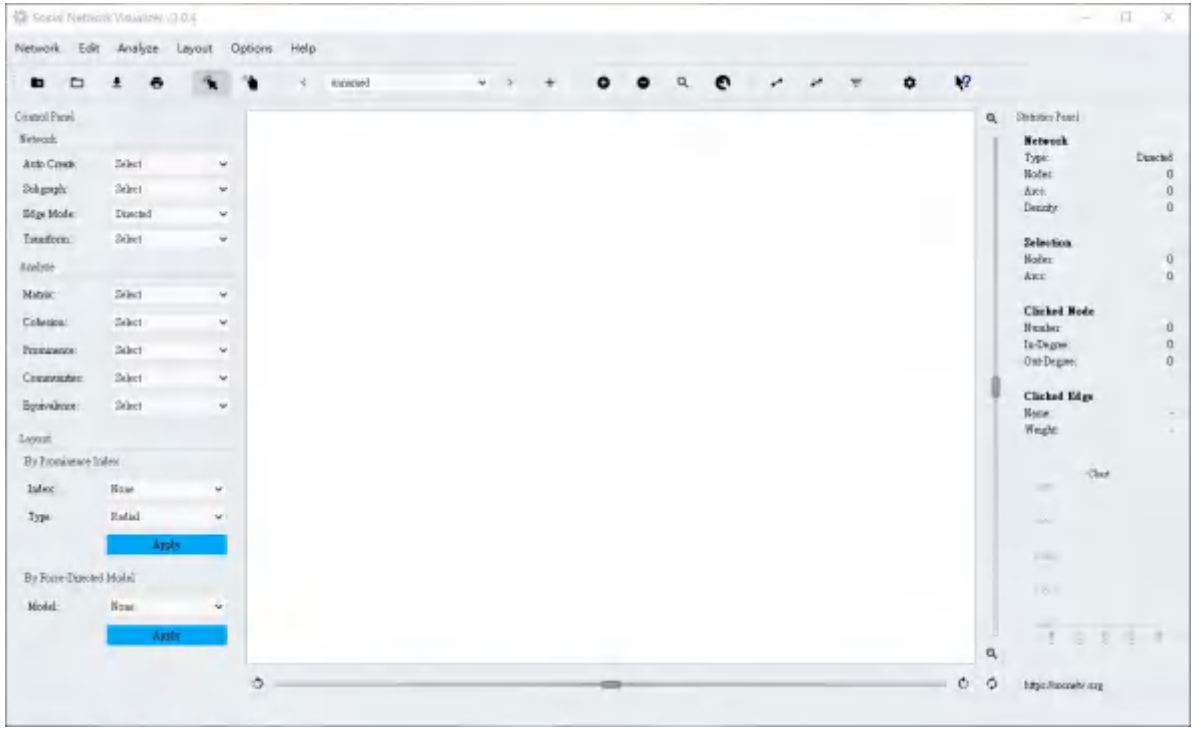


After

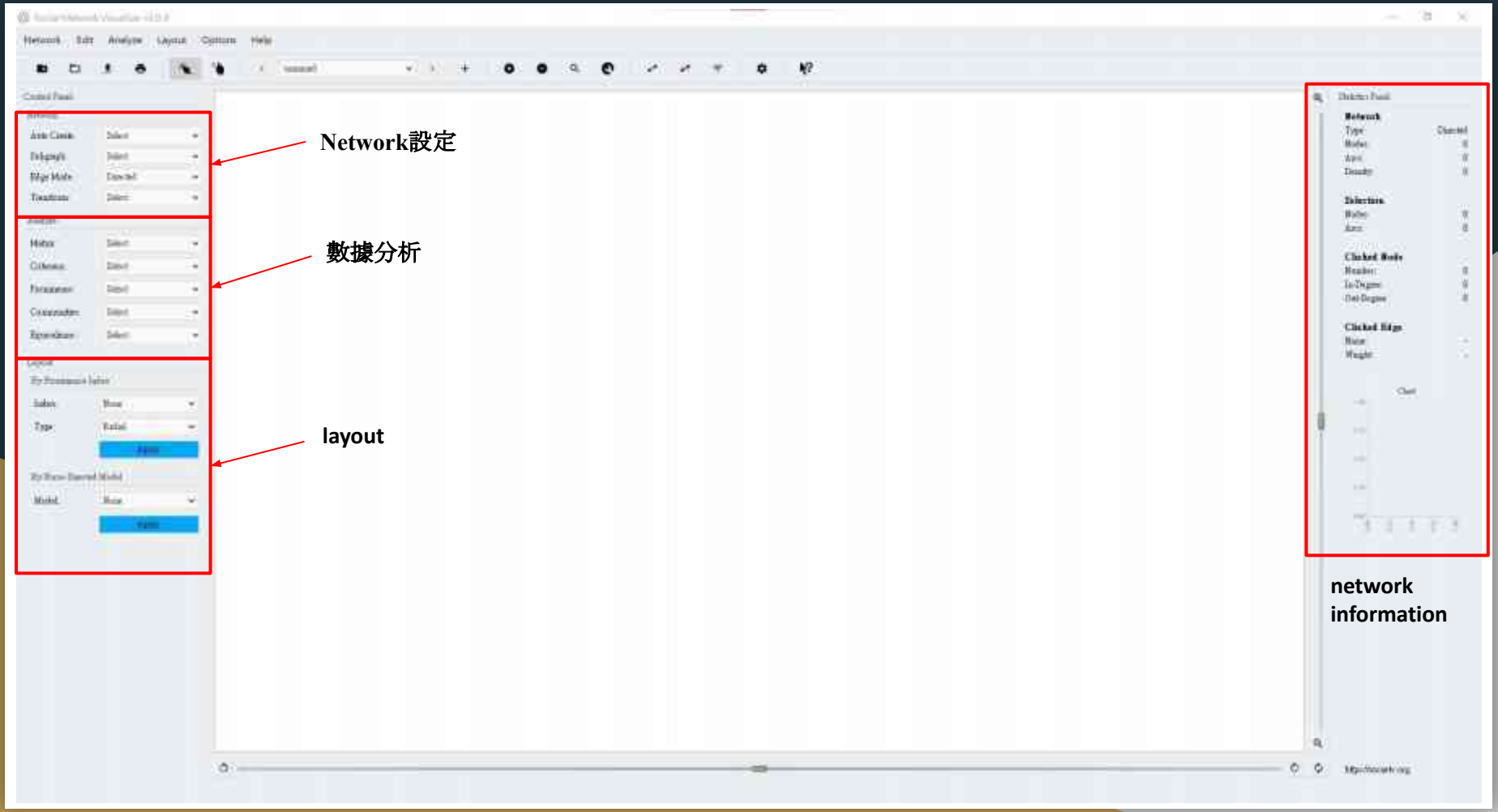


圖片來源: https://wenlab501.github.io/tutorial/gephi_tutor/design/layout/

2. SocNetV


Network
Edit
Analyze
Layout
Options
Help
Control Panel
Statistics Panel
Apply
Apply

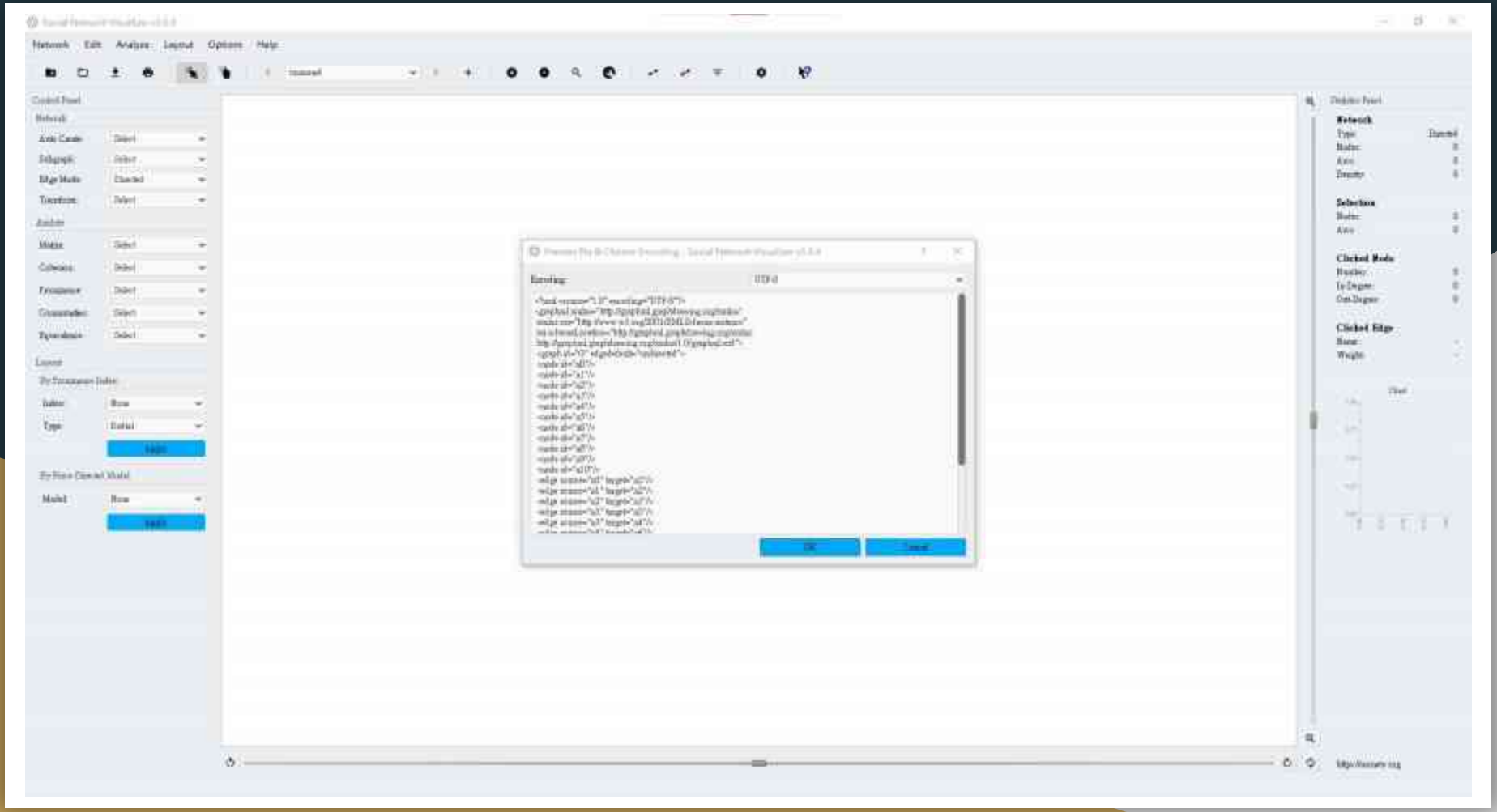
2-1. 介面

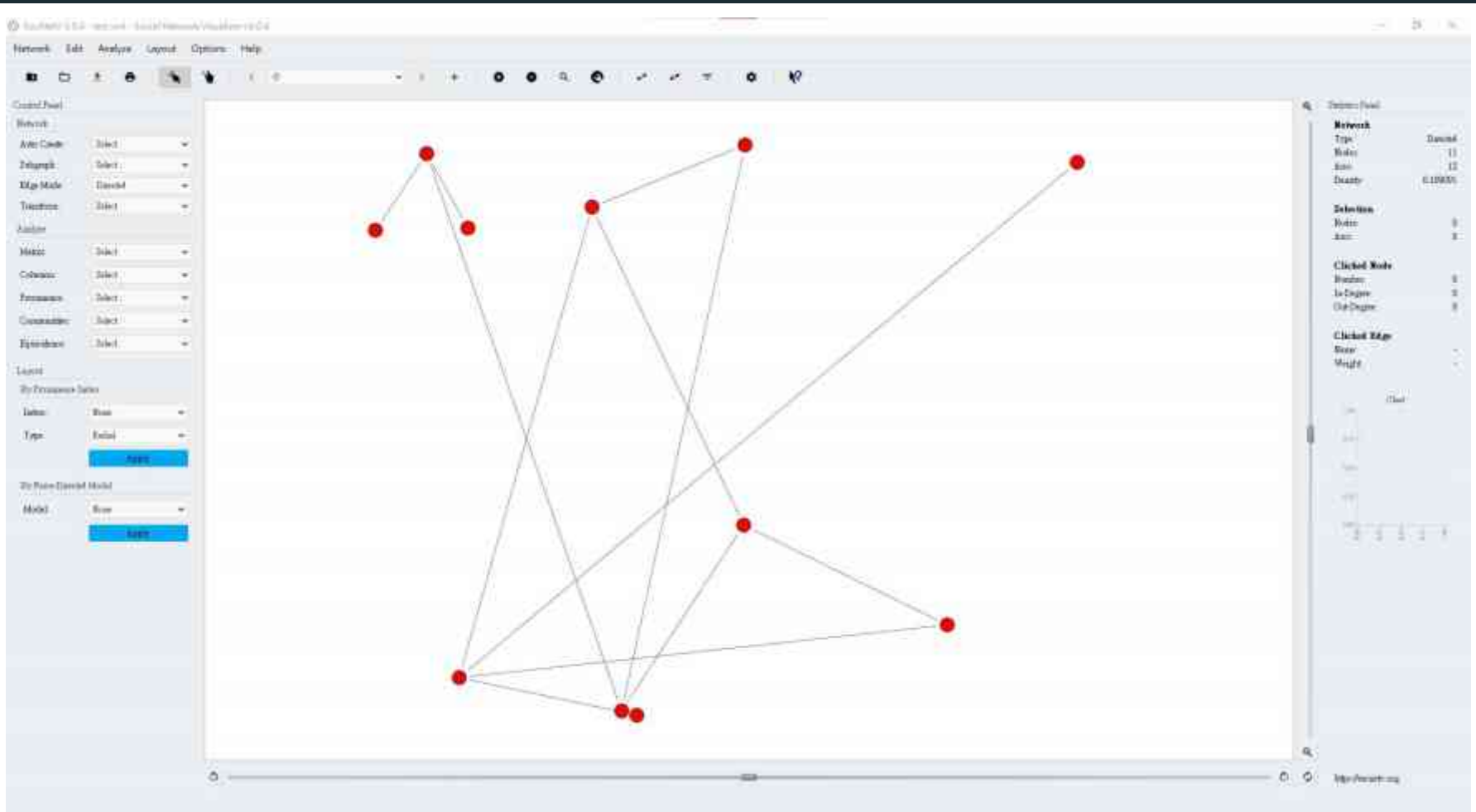

Network設定
數據分析
layout
network information

2-2. Import Data

Input format:

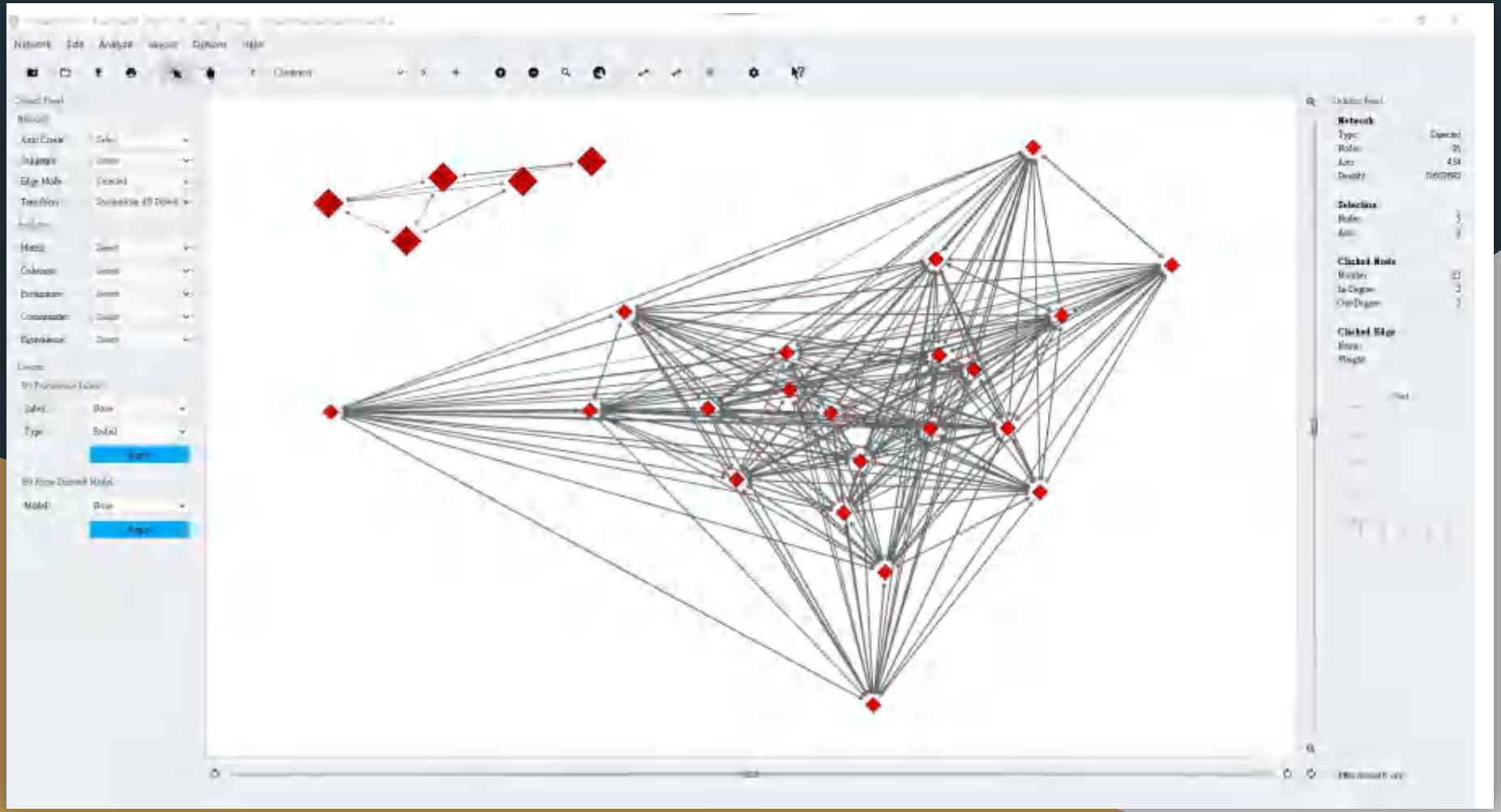
- GraphML (.graphml or .xml),
- GML (.gml or .xml)
- GraphViz (.dot),
- Adjacency matrix (.sm, .adj or .csv)
- Pajek (.net, .paj or .pajek),
- UCINET's Data Language (.dl)
- edge list (.lst or .list)
- Weighted Lists (.wlst or .wlist)


Network
Edit
Analyze
Layout
Options
Help
Control Panel
Clicked Node
Clicked Edge
OK
Cancel


Network
Edit
Analyze
Layout
Options
Help

2-3. Control Panel(Network)

a. Auto Create: 自動建立network
b. Subgraph: 建立子圖(至少三個點)
c. EdgeMode: directed or undirected
d. Transform: to transform the netowk, i.e. symmetrize edges.



2-3. Control Panel(Analyze)

a. **Matrix:** i.e. adjacency
b. **Cohesion:** measures relat
c. **Prominence:** methods to r nside the network.
d. **Community:** compute cli
e. **Equivalence**: The struc such as Hierarchical Cluster Analysis, Tie prc

2-3. Layout

- By prominence index. Here you can select a prominence metric (i.e. Betweenness) and a layout type (i.e. circular).
- By Force Directed Placement (FDP), such as the Kamada-Kawai model.