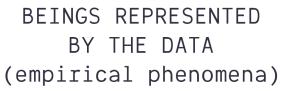


Visual Network Analysis

Practical recipe

Mathieu Jacomy Aalborg University Tantlab

Mind the layers of mediation





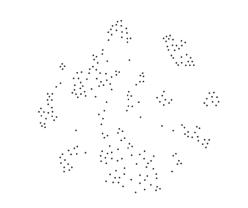
DATA SOURCE (any kind of data)

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Chead?
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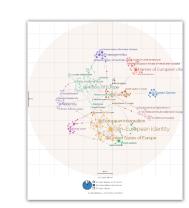
NETWORK DATA (nodes & edges)

Id	Source	Target
an-european identity	counter-reformation	european wars of religion
	counter-reformation	catholic-protestant relations
europe	euroregion	north/south ministerial council
uropean integration	euroregion	british-irish council
inited states of europe	euroregion	european grouping for territorial cooper
names of european cities in differe	euroregion	eurodistrict
history of europe	european grouping for territorial cooper	
oro-europeanism	eurodistrict	euroregion
	mediterranean europe	mediterranean basin
pan-nationalism	mediterranean europe	eurovoc
eurosphere	mediterranean europe	eastern europe
pan-european nationalism	europe	european games
archaeogenetics	europe	european capitals and cities of sport fed
economy of the european union	europe	european youth capital
	europe	european region of gastronomy
nodernity	europe	european capital of culture
genetic history of indigenous peopl	europe	telecommunications in europe
european games	europe	healthcare in europe
genetic history of europe	europe	economy of the european union
european capital of culture	europe	pan-european identity
	europe	largest urban areas of the european union
ommonwealth games	europe	largest cities of the european union by p
enlargement of the european union	europe	european union statistics
elecommunications in europe	europe	area and population of european countries

LAYOUT/EMBEDDING (node coordinates)

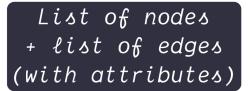


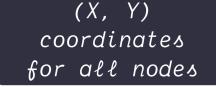
NETWORK MAP (picture)



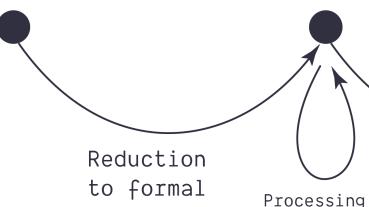
Person, website, book, friendship, influence...







An image on a physical substrate (screen, paper...)



inscriptions

Network extraction (reduction)

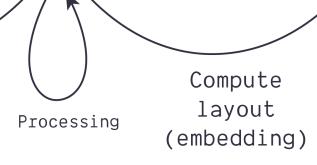


Image rendering
(semiotic building)



Different concepts apply to different layers

PICTURE

- Position / distances / groups
- Size
- Color

GRAPH / NETWORK

- Nodes and edges
- Connected
- Paths, geodesic distance
- Structural equivalence / embeddedness
- Graph metrics (ex: centralities)
- Attributes from algorithms (ex: clustering)
- Attributes from the data

DATA

- Entity (ex: keyword, Twitter user)
- Relation (what does it represent?)
- Attributes

PHENOMENON

- Empirical beings: people, political parties, animals, proteins, companies, documents...
- Conceptual framing
- Research questions

The mediation from one layer to another is never self-evident.

A guided process for visual network analysis

Step 1

Apply a layout to your network.

Step 2

Identify the main clusters.

Circle them and name them temporarily.

Step 3

Identify main structural holes.

Step 4

Identify sub-clusters and minor clusters.

Step 5

Display a node attribute and compare its distribution to the clusters, sub-clusters, and structural holes already identified.

This generates insights (interpretations).

Step 6

Look for nodes in special situations: Central/peripheral, bridge, outlier...

Step 7

Name and describe clusters for clarity.

Note: the process is iterative at multiple levels. Depending on your situation, insights will be treated as hypotheses or findings.

Step 1: Apply a layout

