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Emerging topics in different subject areas

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Emerging topics

- Detecting emerging research topics is useful for research foundations and policy makers aiming to promote and enhance the development of potentially promising research topics.

- The identification of emerging topics is of current interest to decision makers in both government and industry (Small, Boyack, Klavans, 2014).

- Currently, various scientometric approaches have been proposed to identify emerging topics.

Emerging topics

- **Rotolo et al. (2015) grouped Scientometric methodologies into 5 main categories: (1) indicators and trend analysis, (2) citations analysis, (3) co-word(Co-occurrence)analysis, (4) overlay mapping, and (5) combinations of 2 or more of the above methodologies.**

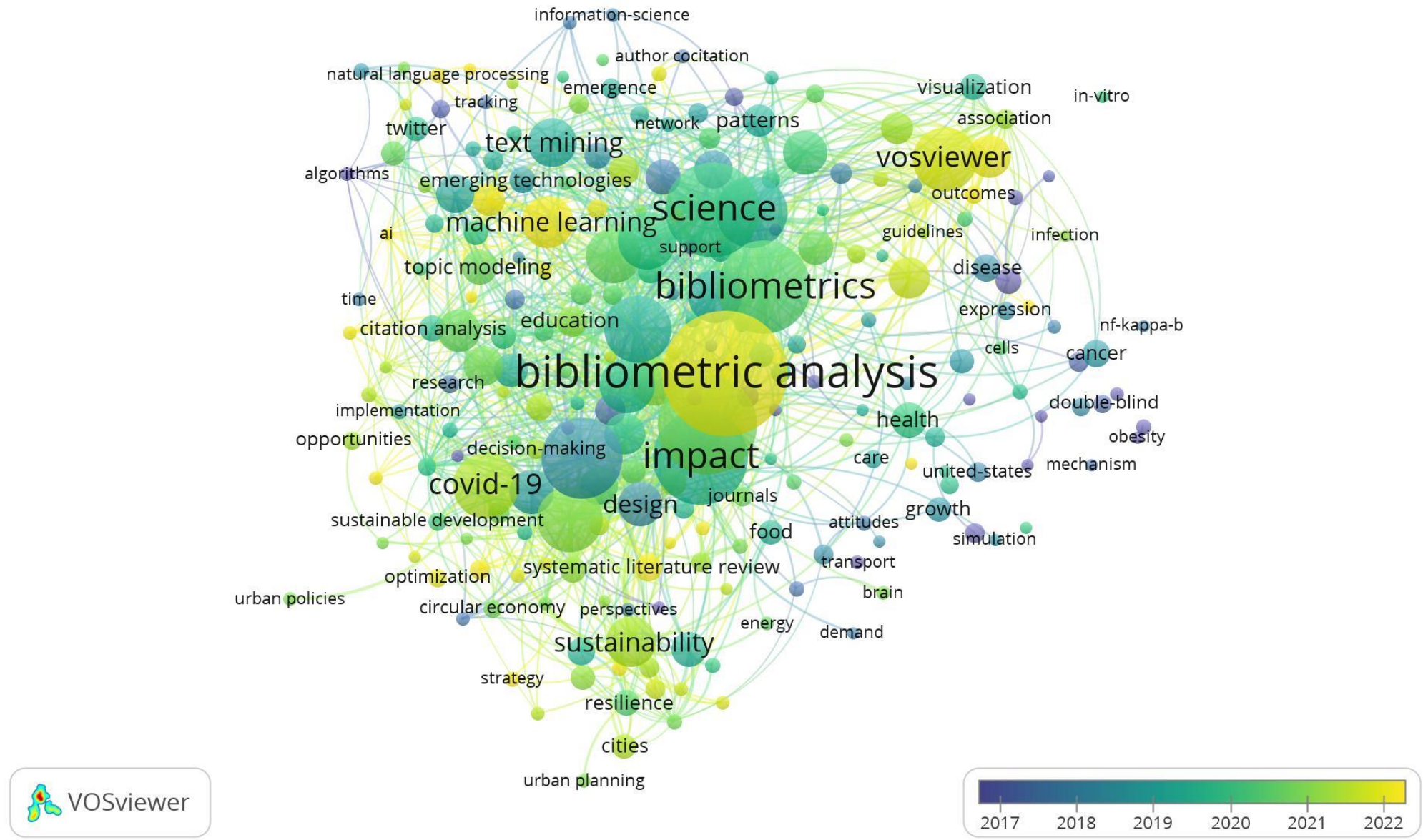
Rotolo et al. (2015) stated that There are two approaches to address these limitations:

(1) Develop a method for predicting future emerging topics(machine learning methods, Lee et al. 2018), curve fitting techniques (Daim et al. 2006; Shin et al. 2013), and stochastic models (Lee et al. 2011, 2016; Jang et al. 2017)

(2) clarify the mechanism by which emerging topics are identified.

Bibliometrics

- Analyze trends in an individual or field of study's research
- Provide evidence for the impact of an individual or field of study's research
- Find new and emerging areas of research
- Identify potential research collaborators
- Identify suitable sources in which to publish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urban planning
VOSviewer
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2018
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2020
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2022

bibliometric software:

- **VOSViewer, CiteSpace, UciNet(NetDraw), and HistCite...**

There is no consensus on which bibliographic method is the best (Merigó, Mulet-Forteza, Valencia, Lew, 2019)

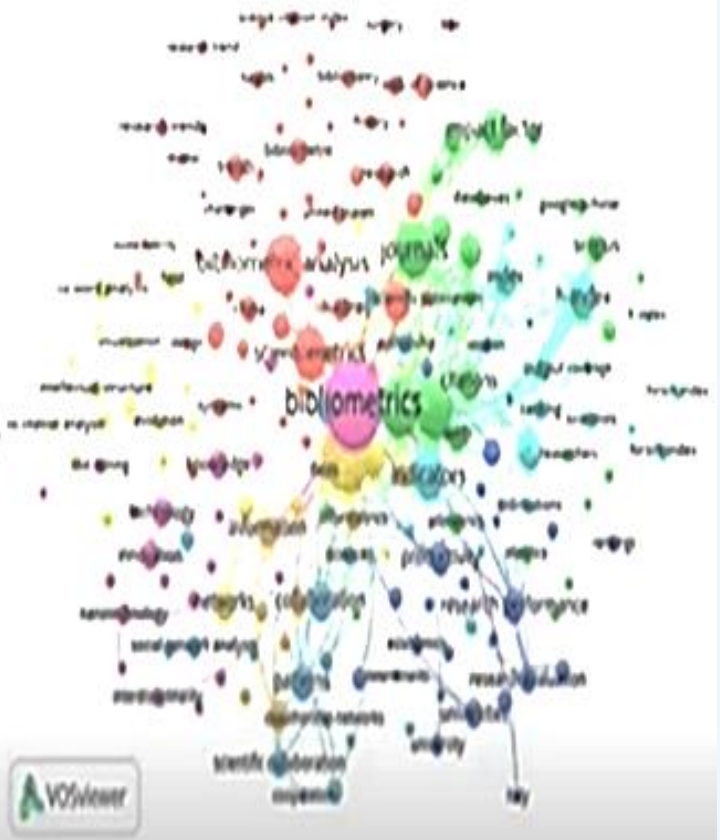
VOSviewer, developed by Leiden University, is a software that does well in creating, visualizing, and exploring maps based on network data (van Eck, Waltman, 2010; Eck, Waltman, 2020).

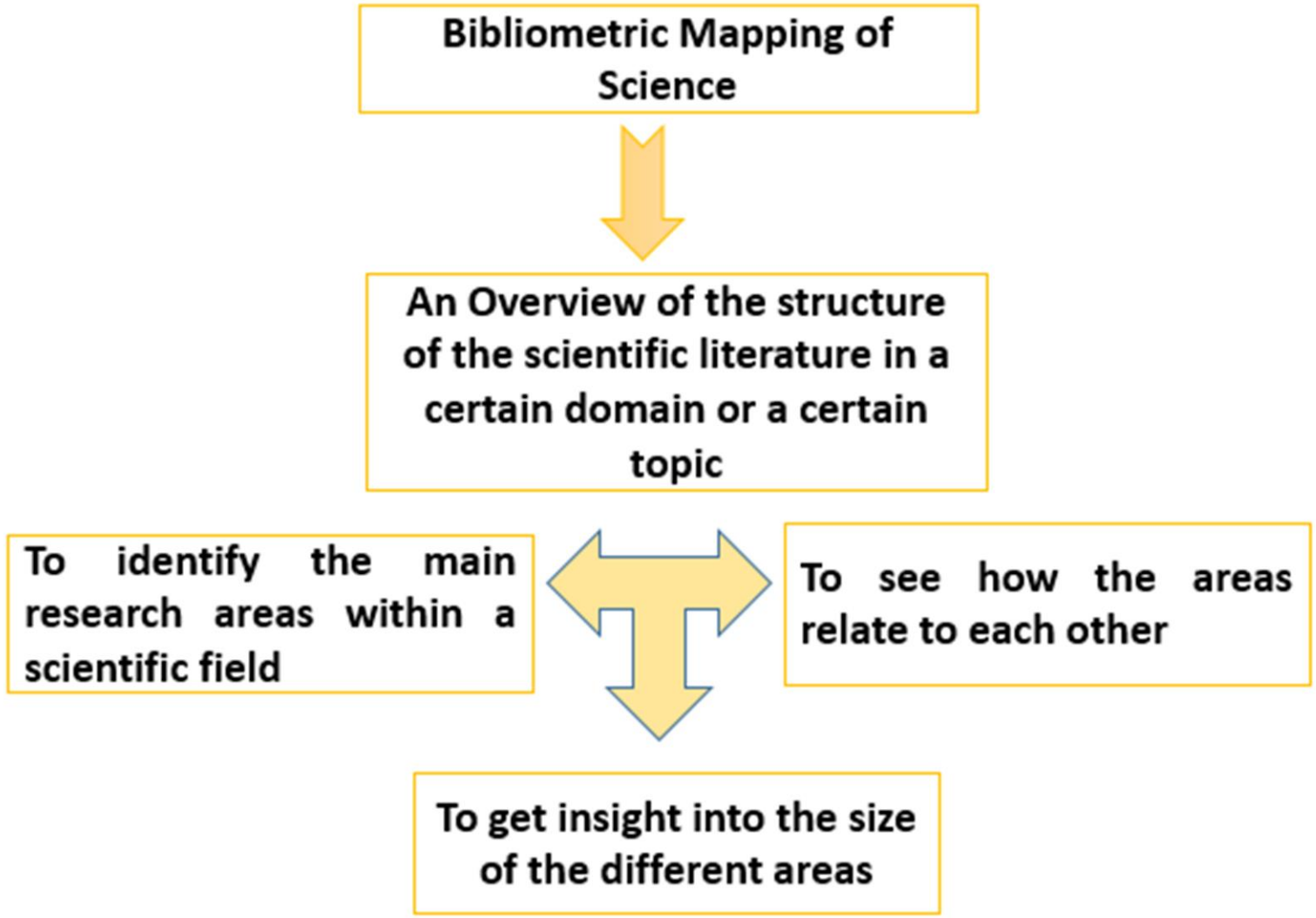
We use VOSviewer 1.6.18 to create keywords co-occurrence and cluster map based on text data.

A statistical analysis of books, articles or other publications

LITERATURE REVIEW

visualize





Flowchart of indentification of emerging topics

Co-occurrence Method:

- **Co-occurrence method enable you to discover and group concepts that are strongly related within the set of documents or records.**

- **Two or more concepts strongly co-occur if they frequently appear together in a set of documents.**

Co-occurrence Method:

Connections between terms are usually drawn from co-occurrences.

two terms will be connected if they appear next to each other

- **in the same sentence**
- **in the same paragraph**
- **in the same document**

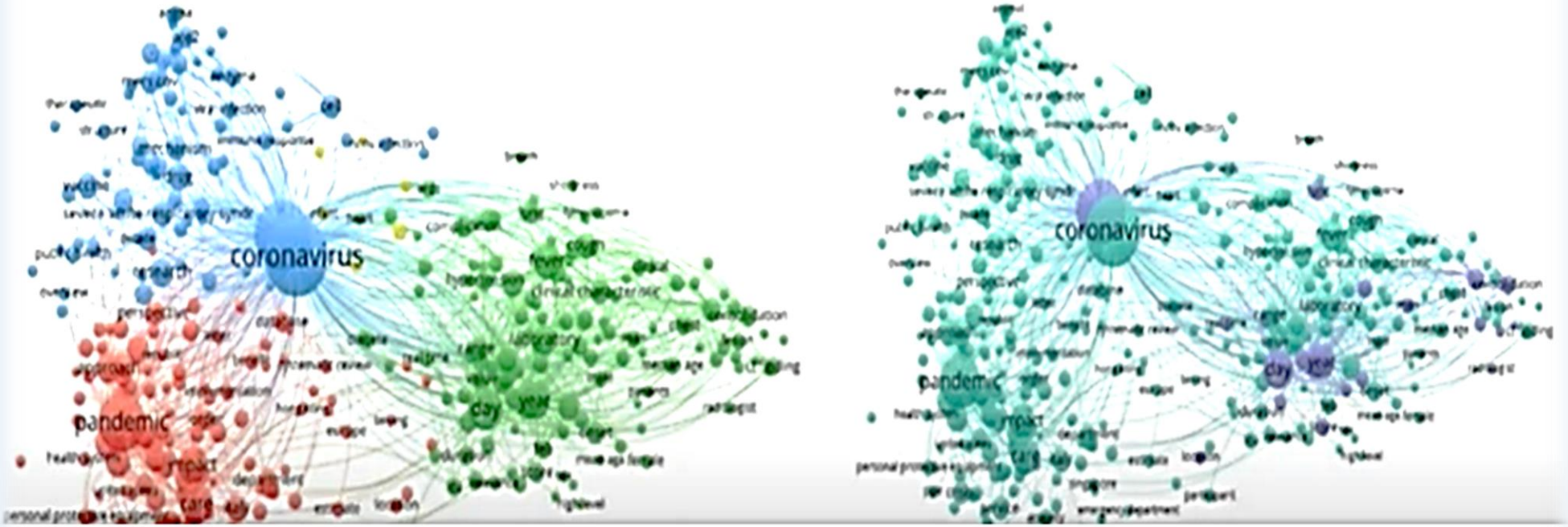
Weight of "1" if these two terms co-occur in just one unit of text.

Weight of "2" if they co-occur in two units of text.

etc…

Bibliometric Mapping of Science

with VOSviewer



vosviewer.com

VOSviewer

Visualizing scientific landscapes

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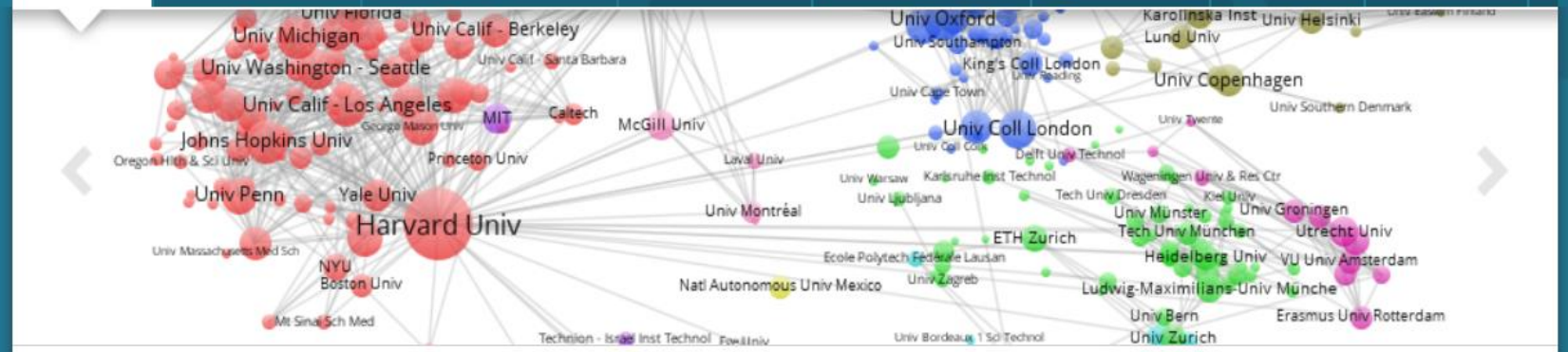

Welcome to VOSviewer

VOSviewer is a software tool for constructing and visualizing bibliometric networks. These networks may for instance include journals, researchers, or individual publications, and they can be constructed based on citation, bibliographic coupling, co-citation, or co-authorship relations. VOSviewer also offers text mining functionality that can be used to construct and visualize co-occurrence networks of important terms extracted from a body of scientific literature.

VOSviewer

- VOSviewer has been developed in the Java programming language
- VOSviewer can be downloaded from www.vosviewer.com. It can be used freely for any purpose.
- VOSviewer is a software tool for constructing and visualizing bibliometric networks.
- These networks include journals, researchers, or individual publications.
- VOSviewer also offers text mining that can be used to construct and visualize co-occurrence networks of important terms extracted from a body of scientific literature.

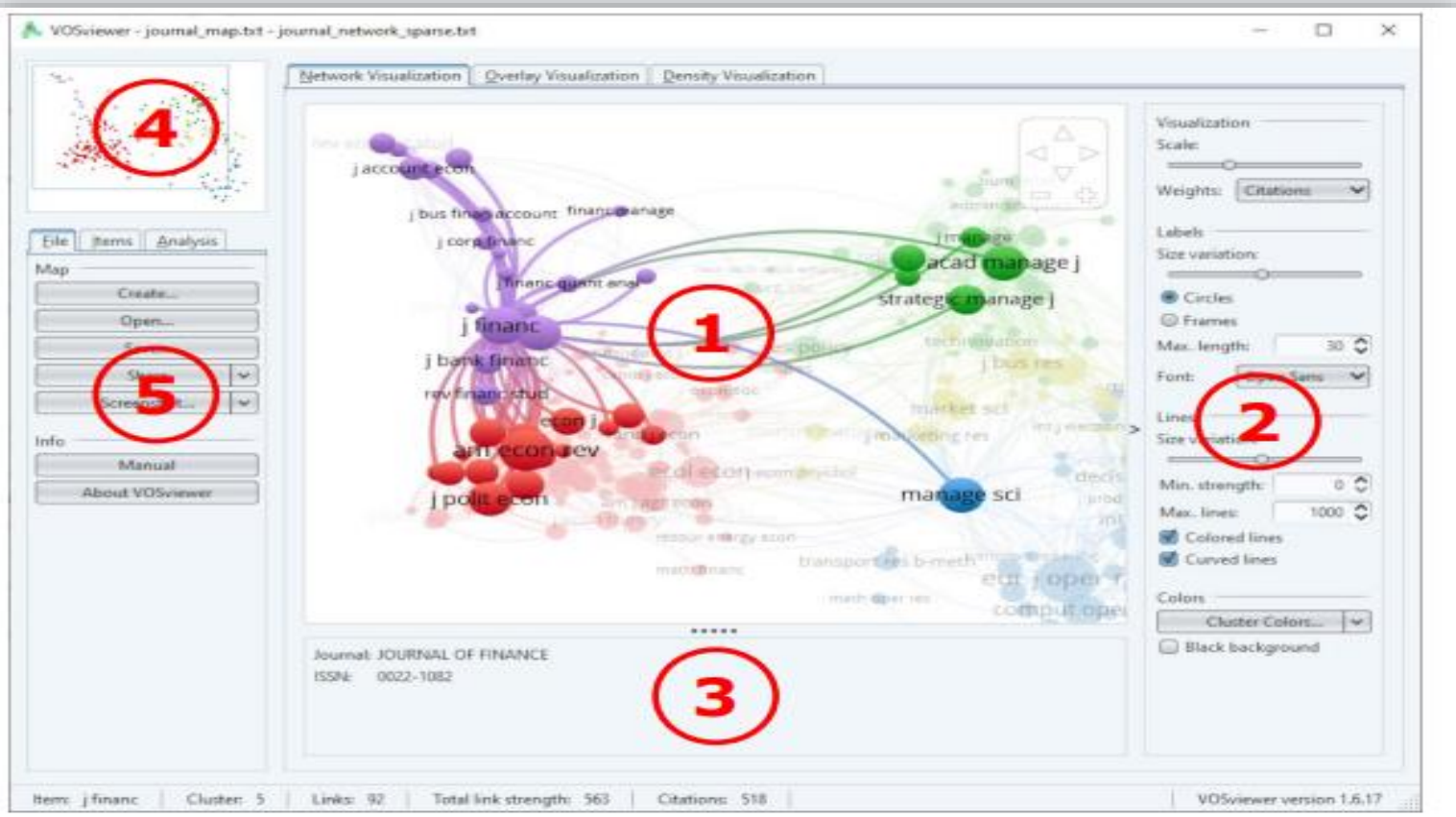

Figure 1. Main window of VOSviewer. The numbers designate (1) the main panel, (2) the options panel, (3) the information panel, (4) the overview panel, and (5) the action panel.

- A **link** *is a connection or a relation between two items (*co-occurrence links between terms). Each link has a *strength*

- The **strength of a link** indicates number of publications in which two terms occur together (in the case of co-occurrence links)

- A **cluster** is a set of items included in a map. Clusters are non-overlapping in VOSviewer.

- A **weight** of an item should in some way indicate the importance of the item. An item with a higher weight is regarded as more important than an item with a lower weight.

- **Links attribute** (the number of links of an item with other items)

- **Total link strength** (the total strength of the links of an item with other items)

- **Fractionalization**: To normalize the strength of the links between items.

Emerging trends in information science:

Hou, J., Yang, X., & Chen, C. (2018). Emerging trends and new developments in information science: A document co-citation analysis (2009–2016). *Scientometrics*, *115*, 869-892.

Example:

WC=(Information Science & Library Science) and ts=("artificial intelligence" OR "AI")

WC=(Information Science & Library Science) and ts=("innovat*")

Good luck