

# Visualizing Science Using OpenAlex and VOSviewer

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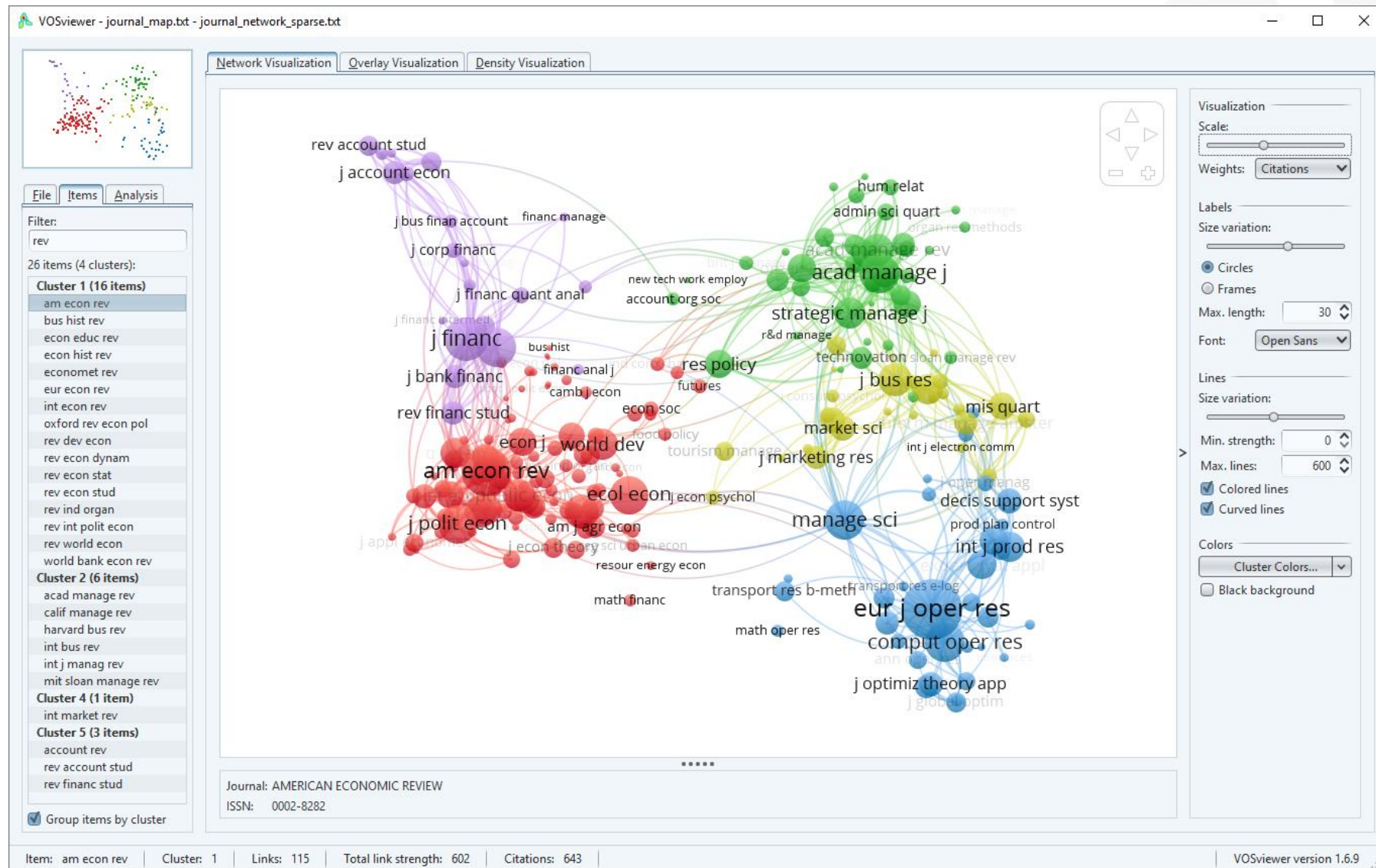
**OpenAlex how-to webinar**

December 14, 2023

# Outline

- VOSviewer intro
- OpenAlex + VOSviewer demos
- Q&A

# VOSviewer



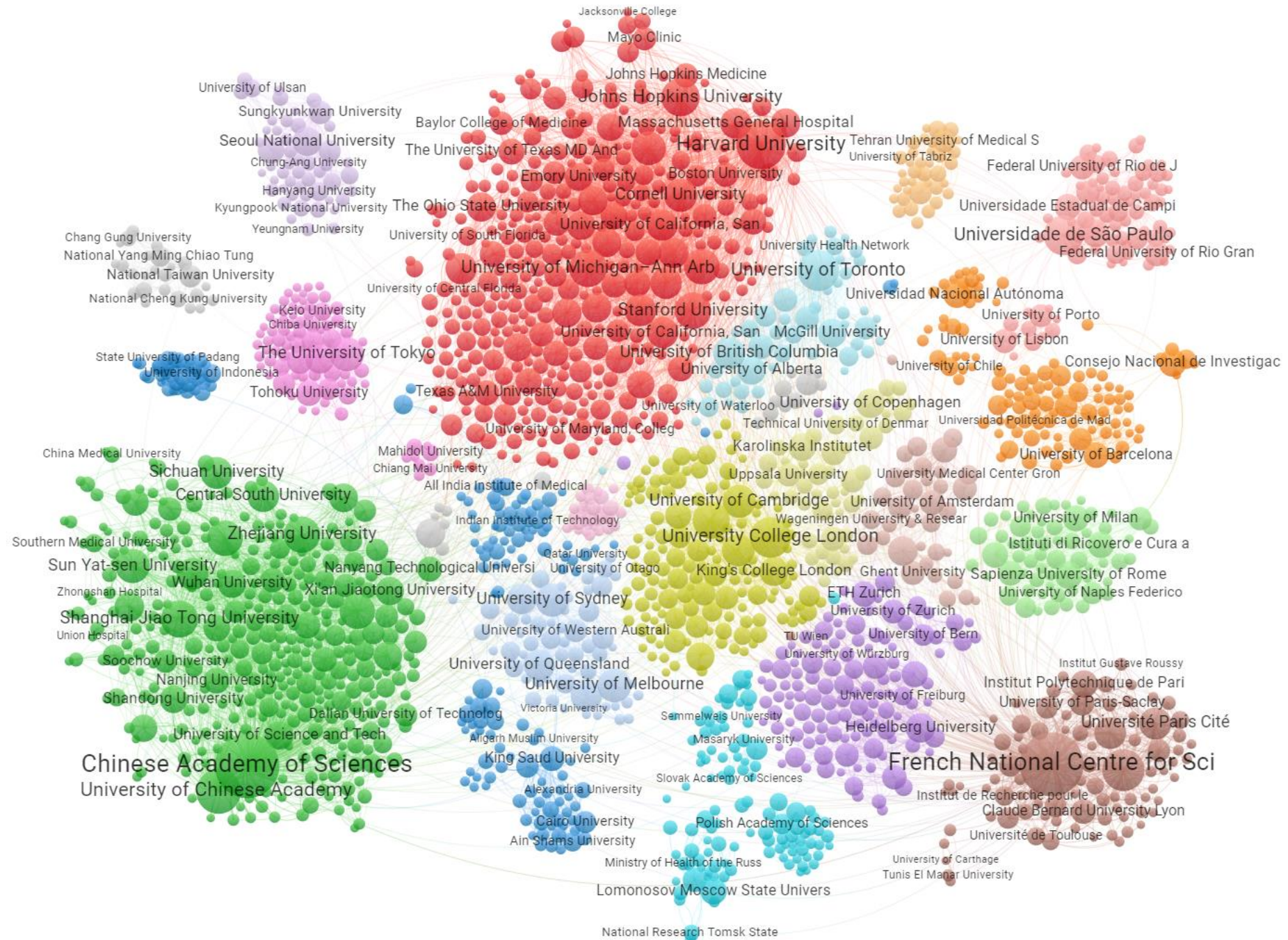


# VOSviewer

- Focus on visualization of scientometric networks
- Support for large number of data sources
- Text mining functionality
- Advanced visualization features
- Relatively easy to use
- Limited analysis options
- Developed at CWTS



<http://tinyurl.com/ynd9ad2r>

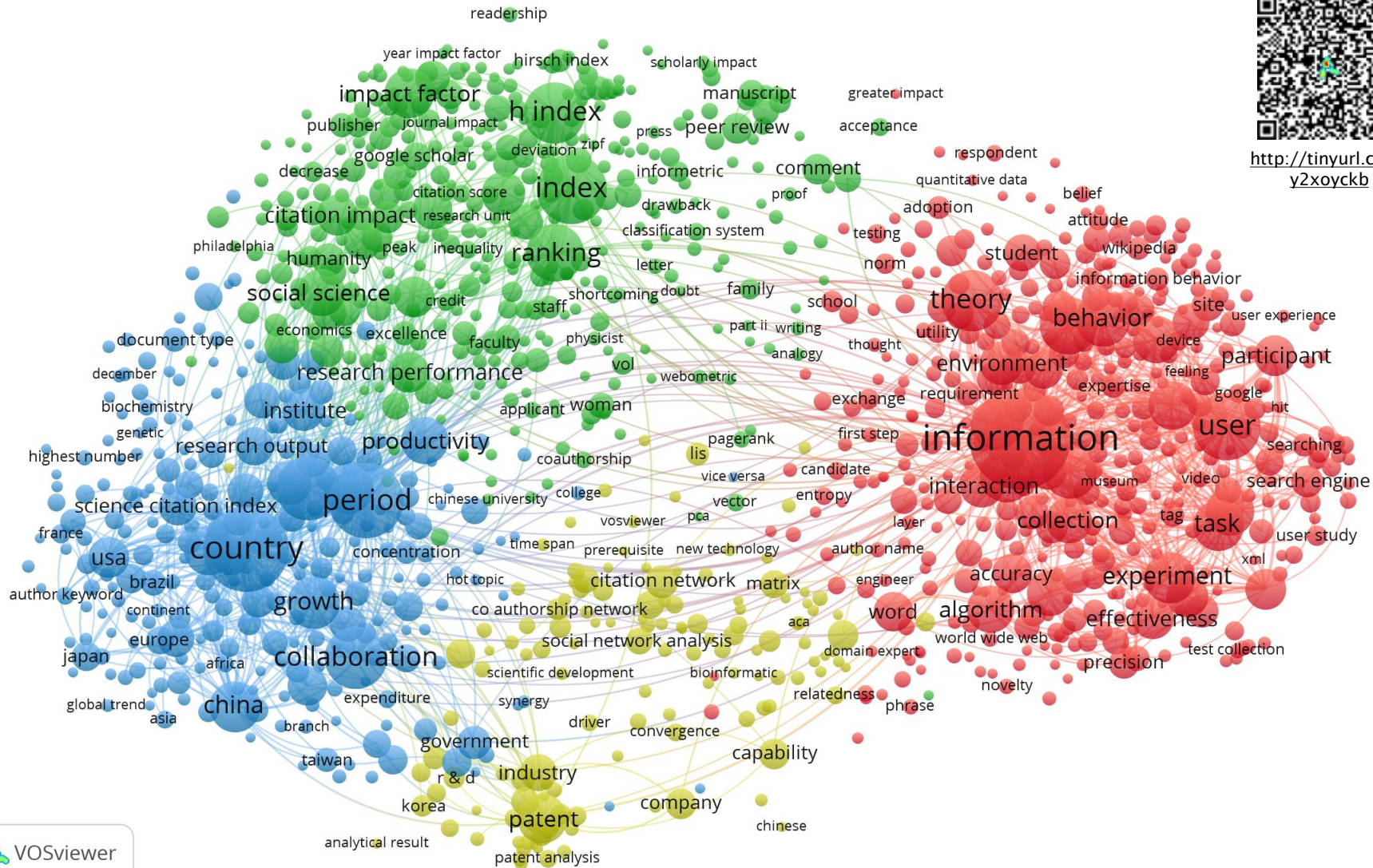




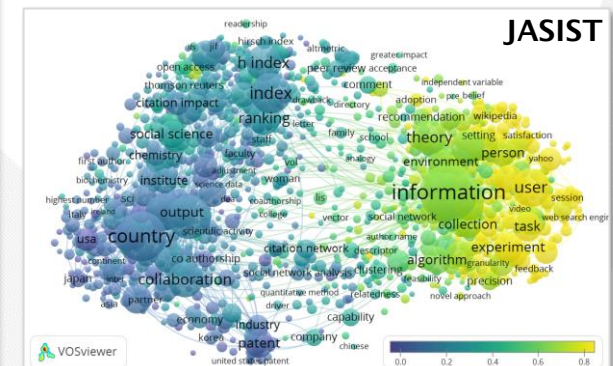
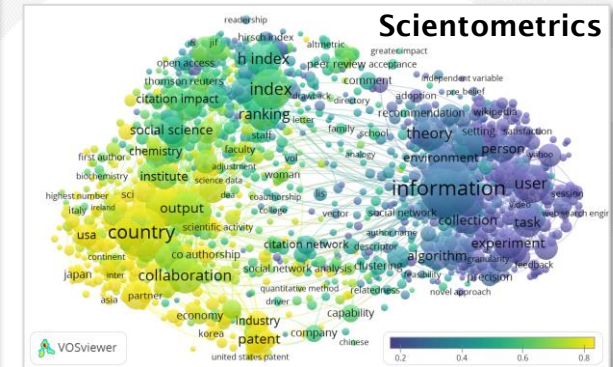
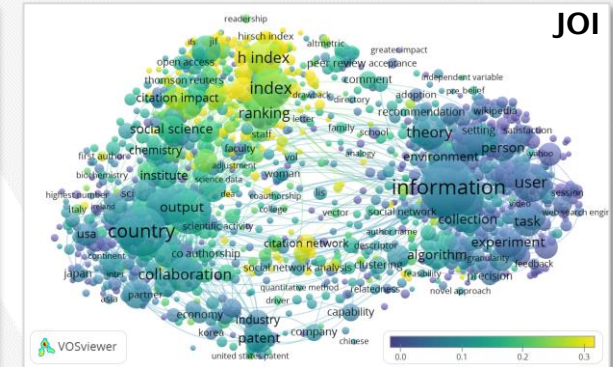




# Text mining

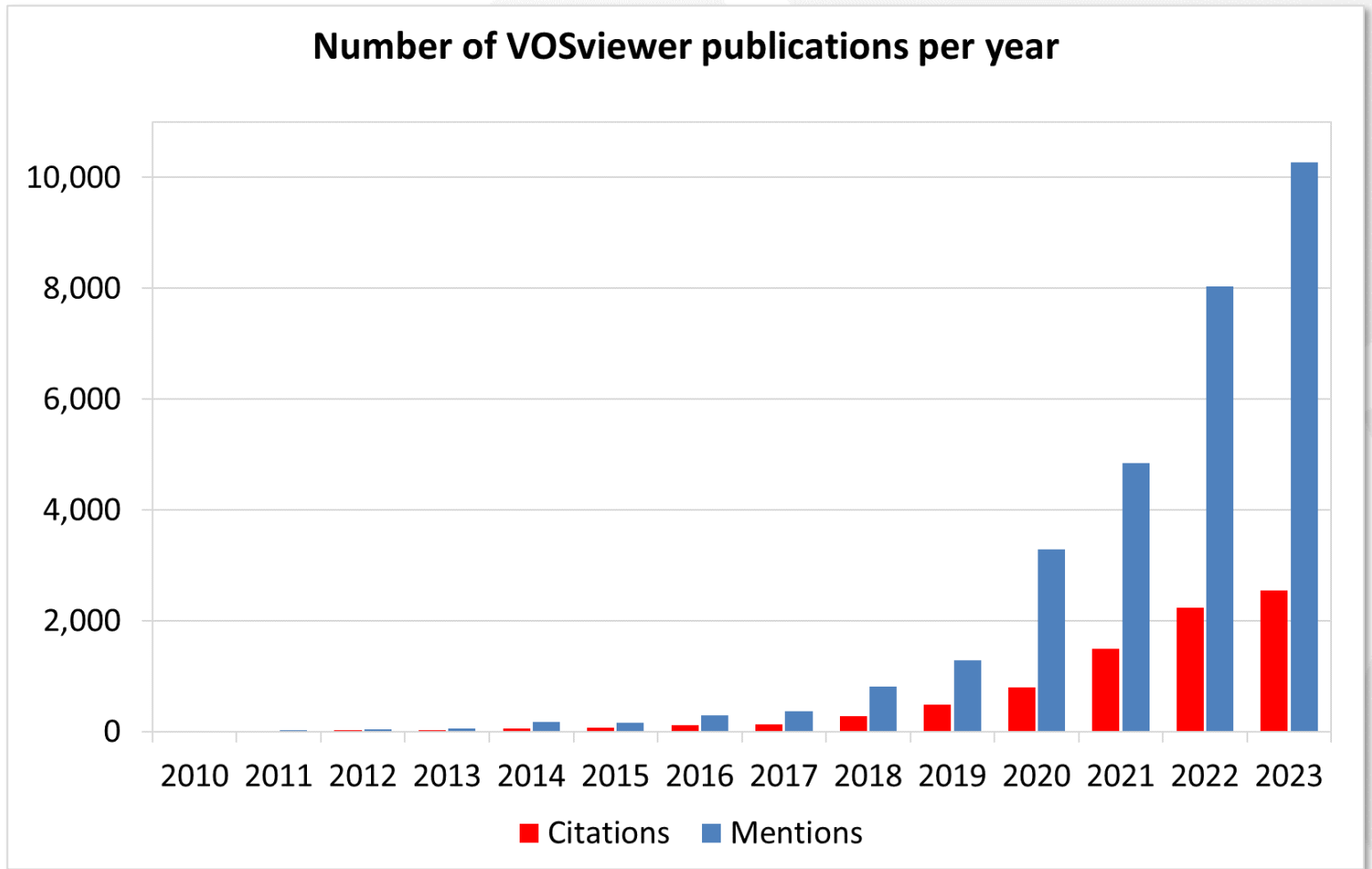


<http://tinyurl.com/y2xoyckb>



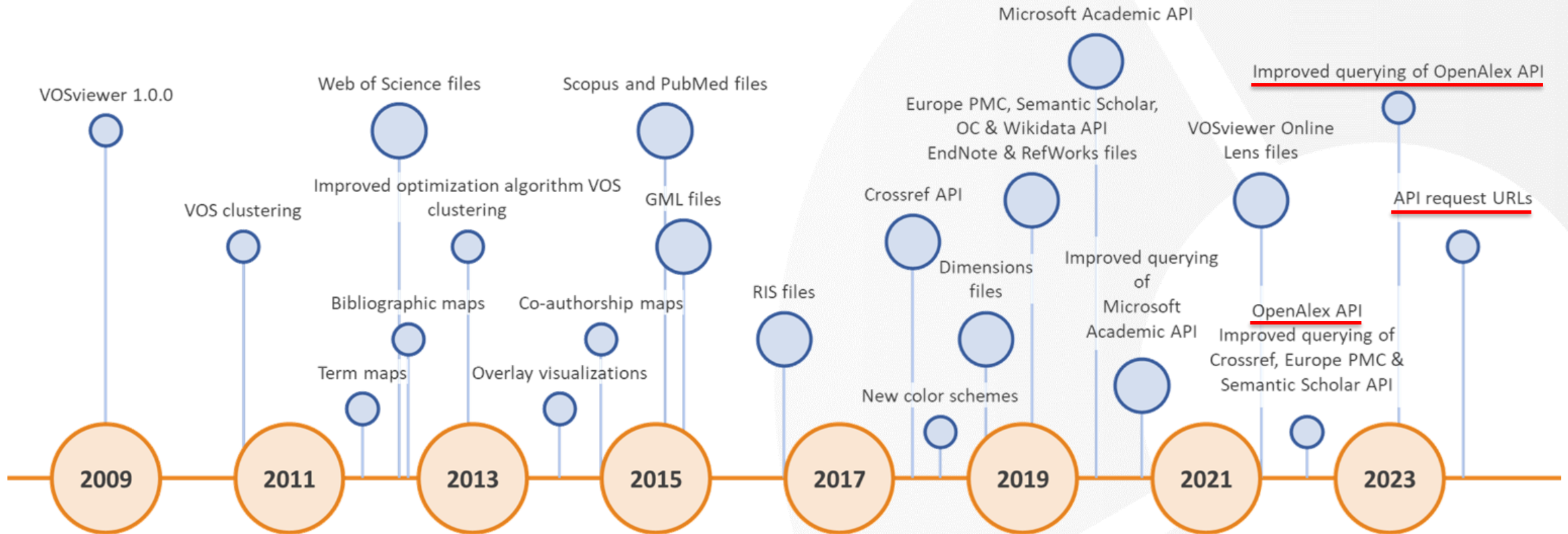
# Users of VOSviewer

- Researchers
- Research institutions
- Research funders
- Scientific publishers
- Industry





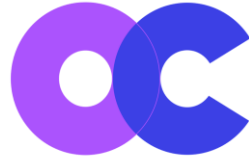
# Development



# Data sources supported by VOSviewer



OpenAlex



Crossref



Europe PMC



LENS.ORG  
Solving The Problem Of Problem Solving™



Semantic Scholar



Dimensions

Web of Science

Scopus

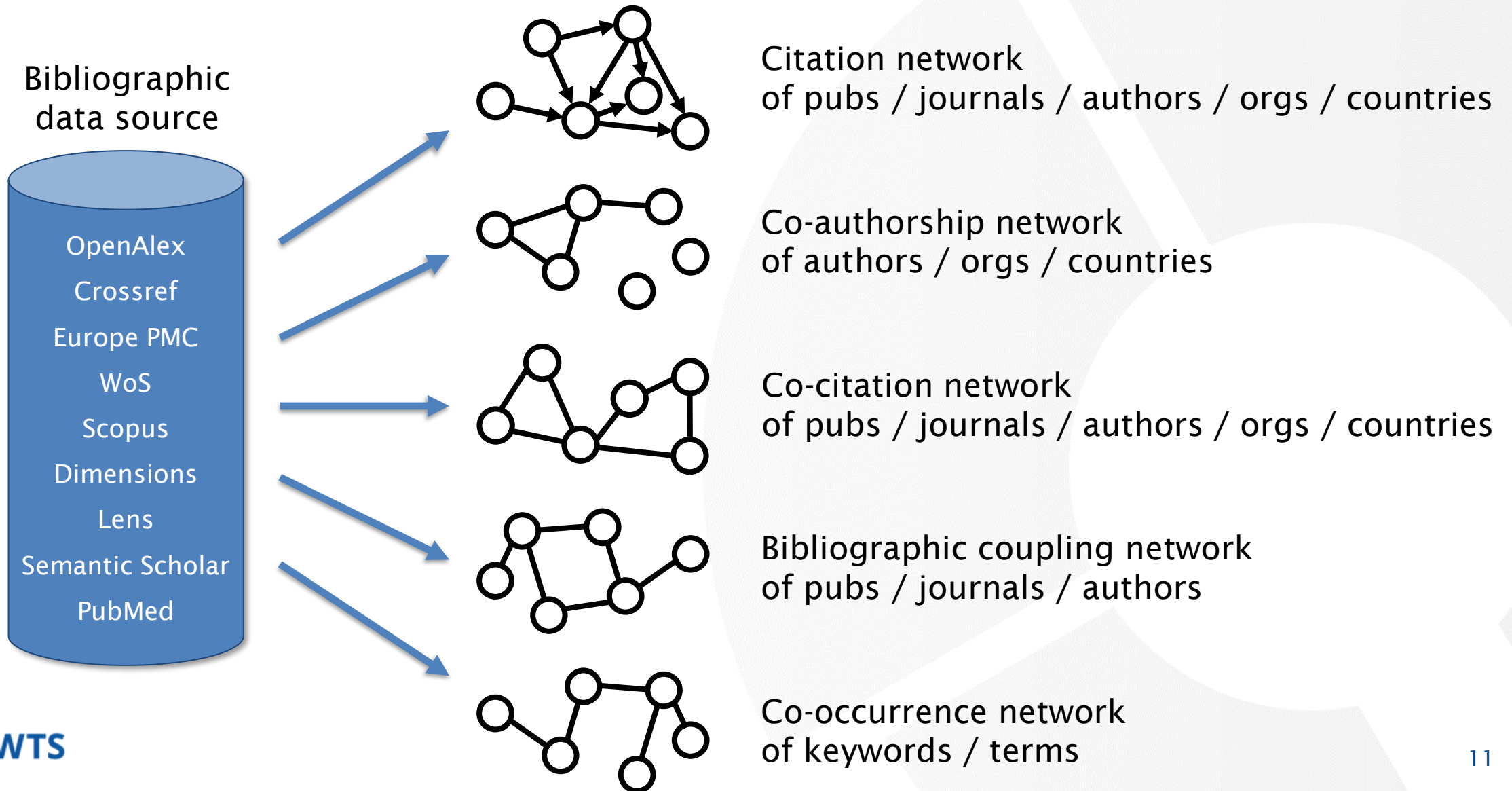




# Bibliographic data sources

	OpenAlex	Dimensions	Scopus	Web of Science
Journals	180,000	110,000	40,000	30,000
Publications	150 million	110 million	50 million	80 million
Citations	1.5 billion	1.5 billion	1.7 billion	1.8 billion

# Bibliometric networks in VOSviewer

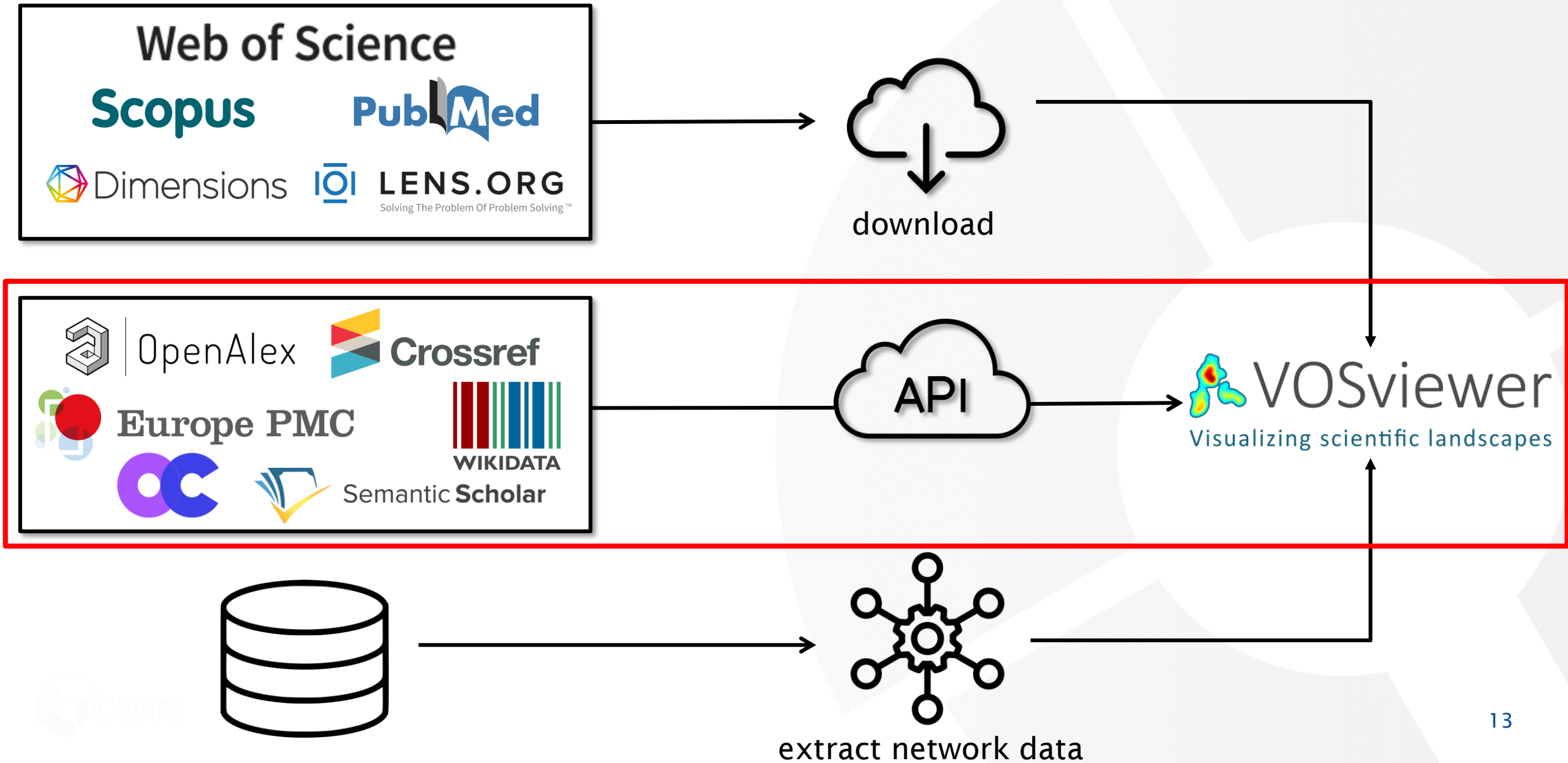




# Types of networks supported by each data source

	Co-authorship	Co-occurrence	Citation	Bibliographic coupling	Co-citation
OpenAlex	✓	✓	✓	✓	✗
Crossref	✓	✓	✓	✓	✓
Europe PMC	✓	✓	✓	✓	✓
Web of Science	✓	✓	✓	✓	✓
Scopus	✓	✓	✓	✓	✓
Dimensions	✓	✓	✓	✓	✓
Lens	✓	✓	✓	✓	✗
PubMed	✓	✓	✗	✗	✗
Semantic Scholar	✓	✓	✓	✓	✓
OCC / COCI	✓	✓	✓	✓	✗
Wikidata	✓	✓	✓	✓	✗

# Data access

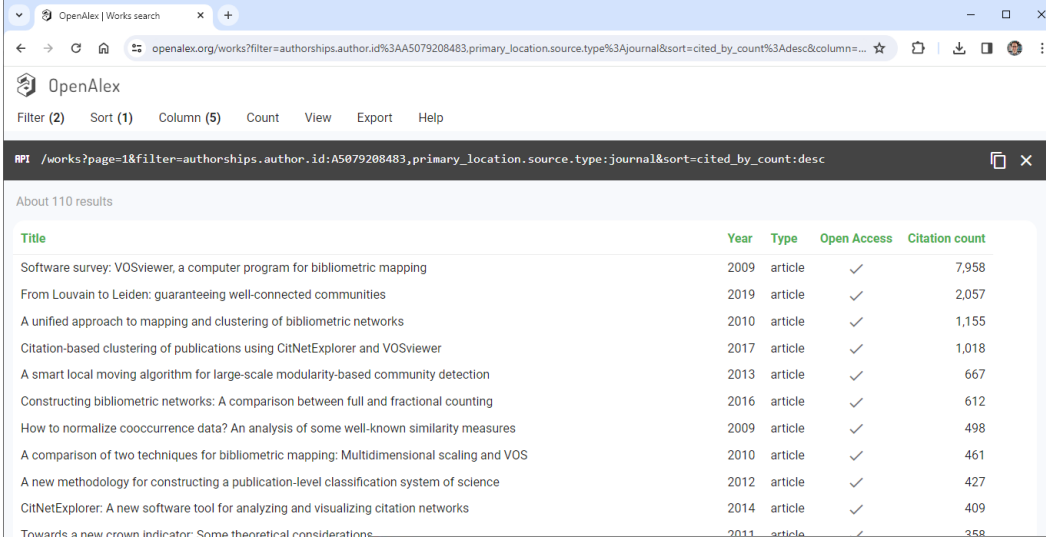




OpenAlex + VOSviewer demos

# Demo 1: Co-authorship network of a researcher

- OpenAlex
  - Filters:
    - Author: Nees Jan van Eck
    - Source type: journal
- VOSviewer
  - API: OpenAlex
  - API request URL:  
[https://api.openalex.org/works?page=1&filter=authorships.author.id:A5079208483,primary\\_location.source.type:journal&sort=cited\\_by\\_count:desc](https://api.openalex.org/works?page=1&filter=authorships.author.id:A5079208483,primary_location.source.type:journal&sort=cited_by_count:desc)



OpenAlex

Filter (2) Sort (1) Column (5) Count View Export Help

API /works?page=1&filter=authorships.author.id:A5079208483,primary\_location.source.type:journal&sort=cited\_by\_count:desc

About 110 results

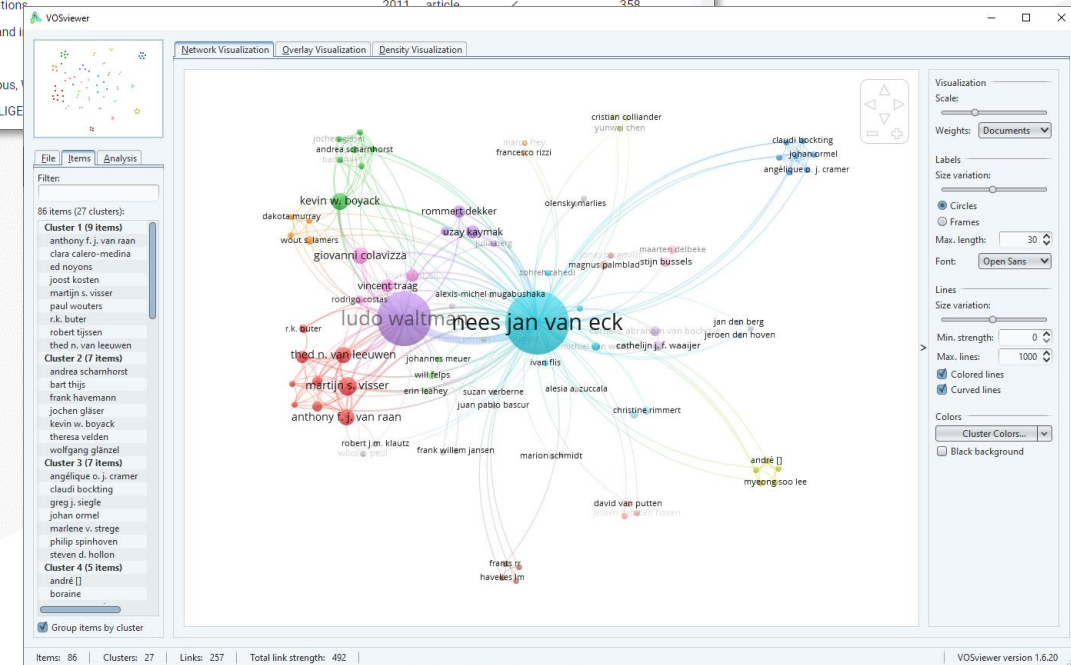
Title	Year	Type	Open Access	Citation count
Software survey: VOSviewer, a computer program for bibliometric mapping	2009	article	✓	7,958
From Louvain to Leiden: guaranteeing well-connected communities	2019	article	✓	2,057
A unified approach to mapping and clustering of bibliometric networks	2010	article	✓	1,155
Citation-based clustering of publications using CitNetExplorer and VOSviewer	2017	article	✓	1,018
A smart local moving algorithm for large-scale modularity-based community detection	2013	article	✓	667
Constructing bibliometric networks: A comparison between full and fractional counting	2016	article	✓	612
How to normalize cooccurrence data? An analysis of some well-known similarity measures	2009	article	✓	498
A comparison of two techniques for bibliometric mapping: Multidimensional scaling and VOS	2010	article	✓	461
A new methodology for constructing a publication-level classification system of science	2012	article	✓	427
CitNetExplorer: A new software tool for analyzing and visualizing citation networks	2014	article	✓	409
Towards a new crown indicator: Some theoretical considerations	2011	article	✓	258

The Leiden ranking 2011/2012: Data collection, indicators, and

The inconsistency of the h-index

Large-scale comparison of bibliographic data sources: Scopus, V

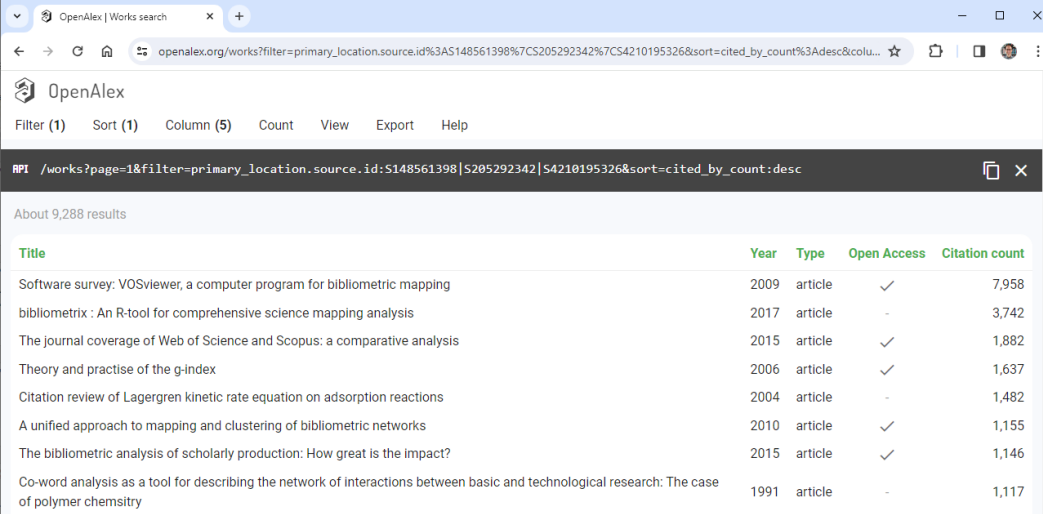
BIBLIOMETRIC MAPPING OF THE COMPUTATIONAL INTELLIGENCE



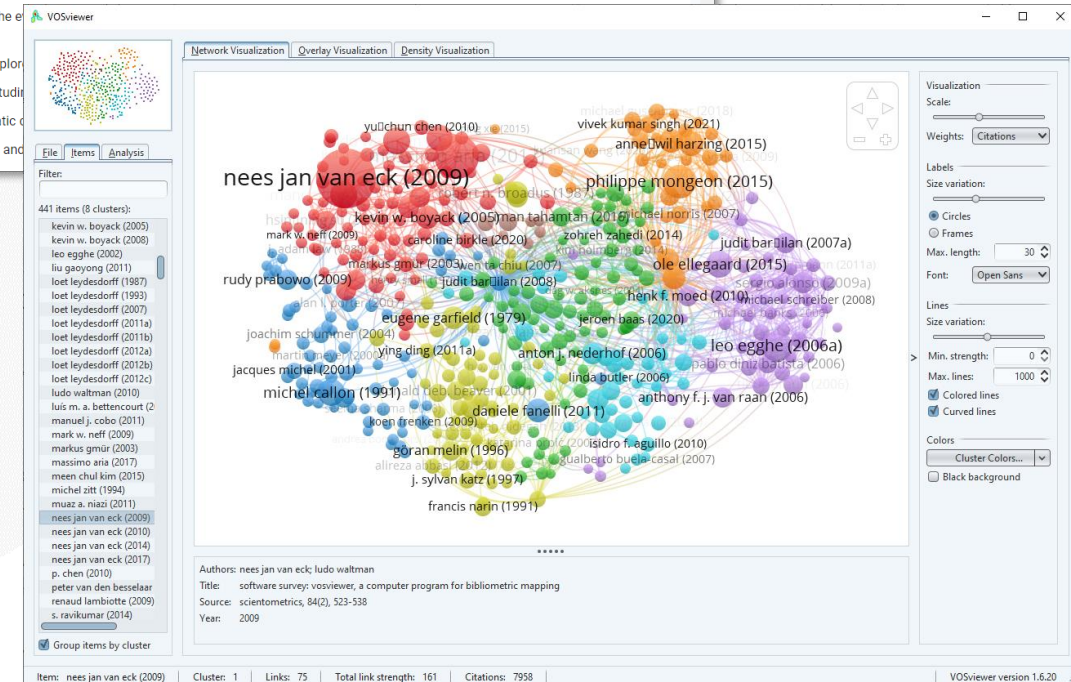


# Demo 2: Bibliographic coupling network of highly cited publications

- OpenAlex
  - Filters:
    - Sources: Scientometrics OR Journal of Informetrics OR Quantitative Science Studies
- VOSviewer
  - API: OpenAlex
  - API request URL:  
[https://api.openalex.org/works?page=1&filter=primary\\_location.source.id:S148561398|S205292342|S4210195326&sort=cited\\_by\\_count:desc](https://api.openalex.org/works?page=1&filter=primary_location.source.id:S148561398|S205292342|S4210195326&sort=cited_by_count:desc)

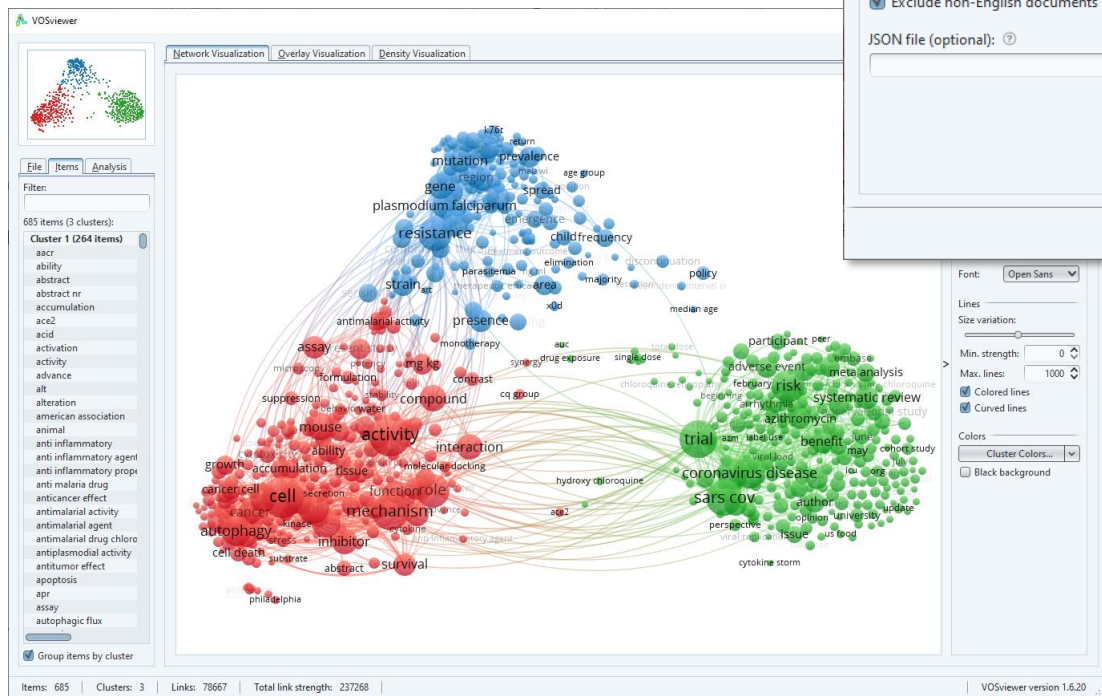


Title	Year	Type	Open Access	Citation count
Software survey: VOSviewer, a computer program for bibliometric mapping	2009	article	✓	7,958
bibliometrix : An R-tool for comprehensive science mapping analysis	2017	article	-	3,742
The journal coverage of Web of Science and Scopus: a comparative analysis	2015	article	✓	1,882
Theory and practise of the g-index	2006	article	✓	1,637
Citation review of Lagergren kinetic rate equation on adsorption reactions	2004	article	-	1,482
A unified approach to mapping and clustering of bibliometric networks	2010	article	✓	1,155
The bibliometric analysis of scholarly production: How great is the impact?	2015	article	✓	1,146
Co-word analysis as a tool for describing the network of interactions between basic and technological research: The case of polymer chemistry	1991	article	-	1,117



# Demo 3: Co-occurrence network of terms extracted from a set of related publications

- VOSviewer
  - API: OpenAlex
  - Search query:
    - Text (title): chloroquine
    - Year: 2016-2022



Create Map

Specify API request or search query, or select files

API Request | Search Query | DOI | JSON

API: OpenAlex

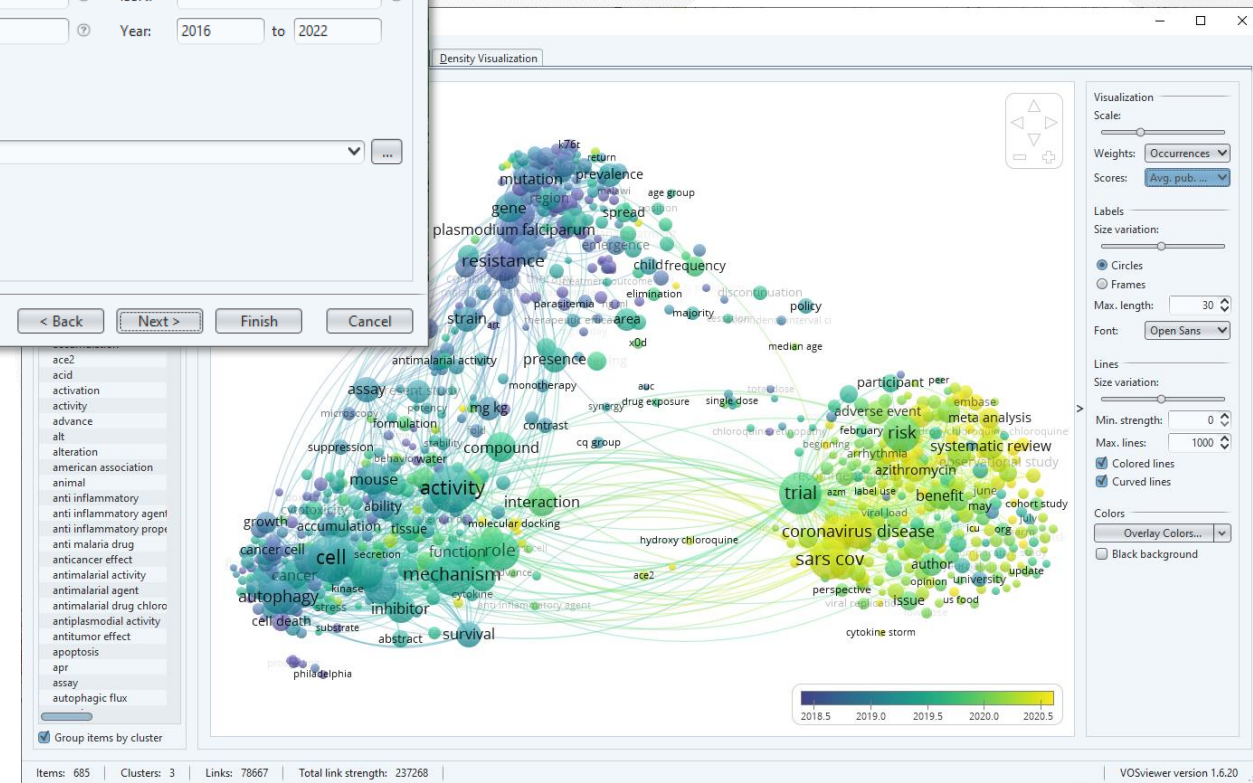
Author ID: ORCID: Affiliation: ROR ID: Source ID: ISSN: Text: chloroquine Year: 2016 to 2022

☒ Title ☐ Abstract ☐ Full text

☒ Exclude non-English documents

JSON file (optional):

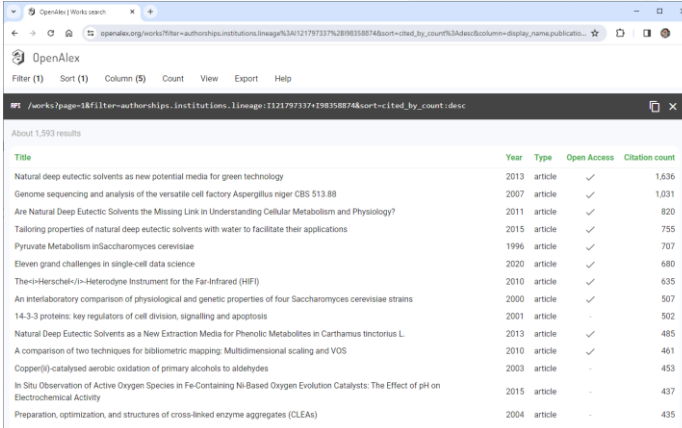
< Back Next > Finish Cancel





# Demo 4: Co-occurrence network of concepts based on a set of collaborative publications

- OpenAlex
  - Filters:
    - Institution: Leiden University AND Delft University of Technology
- VOSviewer
  - API: OpenAlex
  - API request URL:  
[https://api.openalex.org/works?page=1&filter=authorships.institutions.name:198358874+1121797337&sort=cited\\_by\\_count:desc](https://api.openalex.org/works?page=1&filter=authorships.institutions.name:198358874+1121797337&sort=cited_by_count:desc)



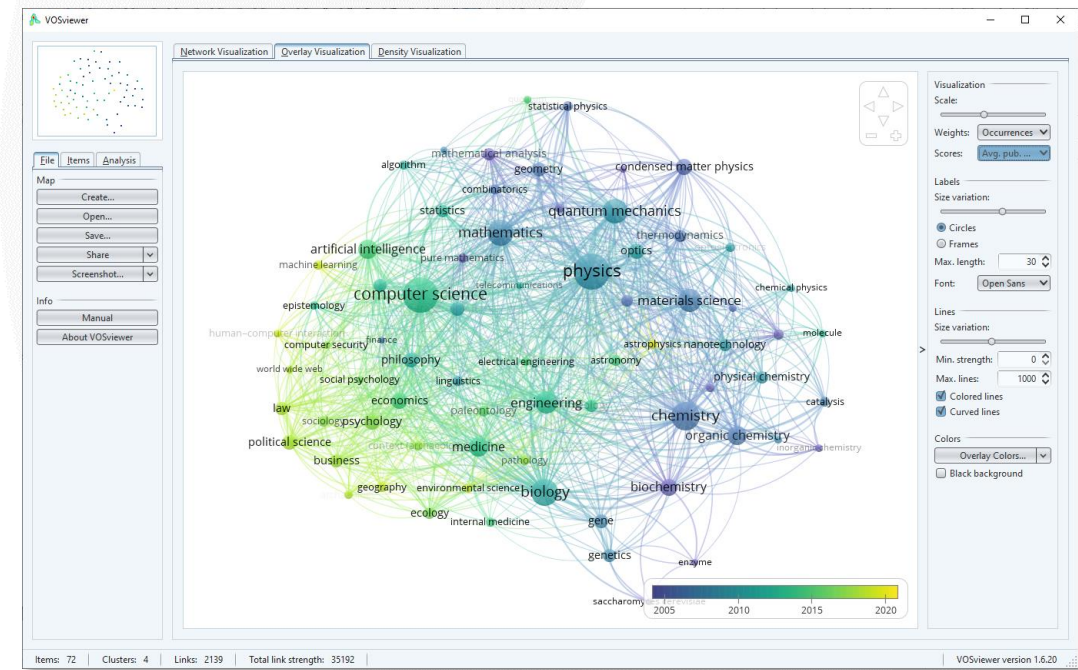
OpenAlex

Filter (1) Sort (1) Column (5) Count View Export Help

API /works?page=1&filter=authorships.institutions.name:198358874+1121797337&sort=cited\_by\_count:desc

About 1,593 results

Title	Year	Type	Open Access	Citation count
Natural deep eutectic solvents as new potential media for green technology	2013	article	✓	1,636
Genome sequencing and analysis of the versatile cell factory <i>Aspergillus niger</i> CBS 513.68	2007	article	✓	1,031
Are Natural Deep Eutectic Solvents the Missing Link in Understanding Cellular Metabolism and Physiology?	2011	article	✓	820
Tailoring properties of natural deep eutectic solvents with water to facilitate their applications	2015	article	✓	755
Pyruvate Metabolism in <i>Saccharomyces cerevisiae</i>	1996	article	✓	707
Eleven grand challenges in single-cell data science	2020	article	✓	680
The <i>i</i> -Herschel- <i>i</i> -Heterodyne Instrument for the Far-Infrared (HIFI)	2010	article	✓	635
An interlaboratory comparison of physiological and genetic properties of four <i>Saccharomyces cerevisiae</i> strains	2000	article	✓	507
14-3-3 proteins: key regulators of cell division, signalling and apoptosis	2001	article	✓	502
Natural Deep Eutectic Solvents as a New Extraction Media for Phenolic Metabolites in <i>Carthamus tinctorius</i> L.	2013	article	✓	485
A comparison of two techniques for bibliometric mapping: Multidimensional scaling and VOS	2010	article	✓	461
Copper(II)-catalysed aerobic oxidation of primary alcohols to aldehydes	2003	article	-	453
In Situ Observation of Active Oxygen Species in Fe-Containing Ni-Based Oxygen Evolution Catalysts: The Effect of pH on Electrochemical Activity	2015	article	-	437
Preparation, optimization, and structures of cross-linked enzyme aggregates (CLEAs)	2004	article	-	435
ionic Liquids and Deep Eutectic Solvents in Natural Products Research: Mixtures of Solids as Extraction Solvents	2013	article	✓	351



# Demo 5: Co-authorship network of researchers of a university and their collaborators

- OpenAlex

- Filters:

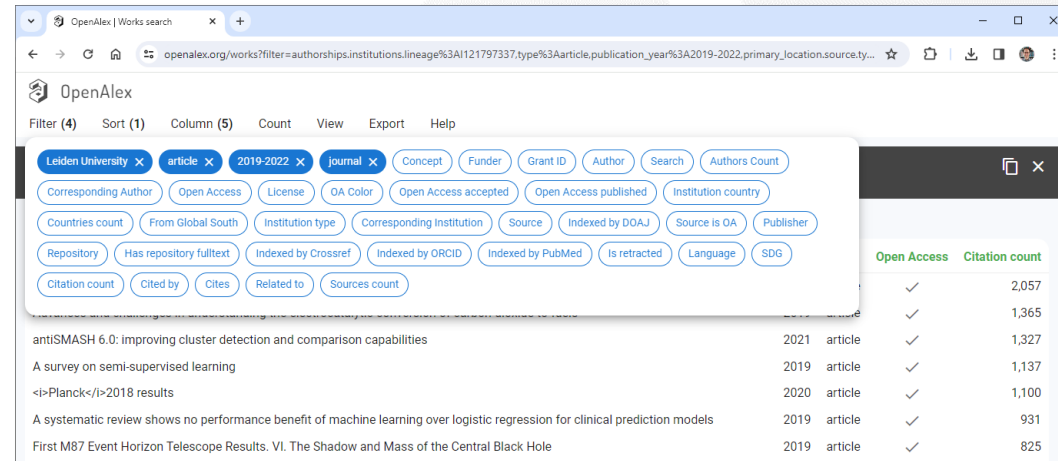
- Institution: Leiden University
    - Work type: article
    - Source type: journal
    - Year: 2019-2022

- VOSviewer

- API: OpenAlex

- API request URL:

[https://api.openalex.org/works?page=1&filter=authorships.institutions.lineage:1121797337,publication\\_year:2019-2022,type:article,primary\\_location.source.type:journal&sort=cited\\_by\\_count:desc](https://api.openalex.org/works?page=1&filter=authorships.institutions.lineage:1121797337,publication_year:2019-2022,type:article,primary_location.source.type:journal&sort=cited_by_count:desc)



OpenAlex

Filter (4) Sort (1) Column (5) Count View Export Help

Leiden University article 2019-2022 journal Concept Funder Grant ID Author Search Authors Count

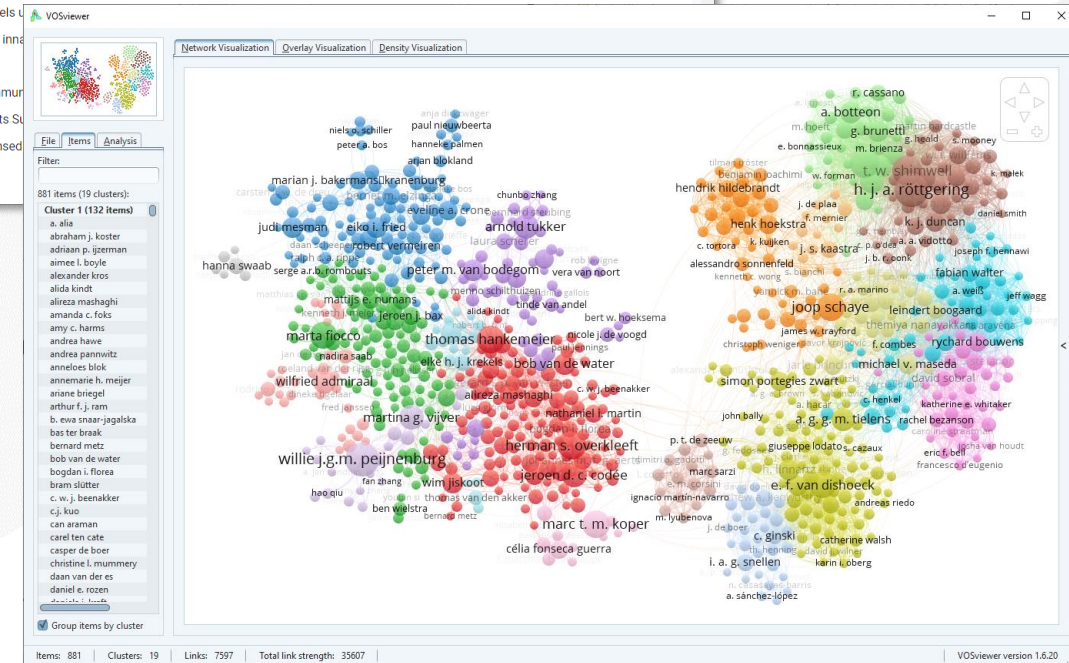
Corresponding Author Open Access License OA Color Open Access accepted Open Access published Institution country

Countries count From Global South Institution type Corresponding Institution Source Indexed by DOAJ Source is OA Publisher

Repository Has repository fulltext Indexed by Crossref Indexed by ORCID Indexed by PubMed Is retracted Language SDG

Citation count Cited by Cites Related to Sources count

	Open Access	Citation count
antiSMASH 6.0: Improving cluster detection and comparison capabilities	✓	2,057
A survey on semi-supervised learning	✓	1,365
<math>\langle \mathbf{I} \rangle</math> Planck results	✓	1,327
A systematic review shows no performance benefit of machine learning over logistic regression for clinical prediction models	✓	1,137
First M87 Event Horizon Telescope Results. VI. The Shadow and Mass of the Central Black Hole	✓	1,100
Creation and analysis of biochemical constraint-based models	✓	931
Papain-like protease regulates SARS-CoV-2 viral spread and innate immunity	✓	825
Eleven grand challenges in single-cell data science		
Molecular and pharmacological modulators of the tumor immune microenvironment		
CO-RADS: A Categorical CT Assessment Scheme for Patients Suspected of Lung Cancer		
HOLICOW – XIII. A 2.4 per cent measurement of H <sub>0</sub> from lensed quasars		
<math>\langle \mathbf{I} \rangle</math> Gaia Early Data Release 3		
HMDB 5.0: the Human Metabolome Database for 2022		







**Thank you for your attention!**



# Q&A