Visualizing Science Using OpenAlex and VOSviewer

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Centre for Science and Technology Studies (CWTS), Leiden University

OpenAlex how-to webinar
December 14, 2023

Outline

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

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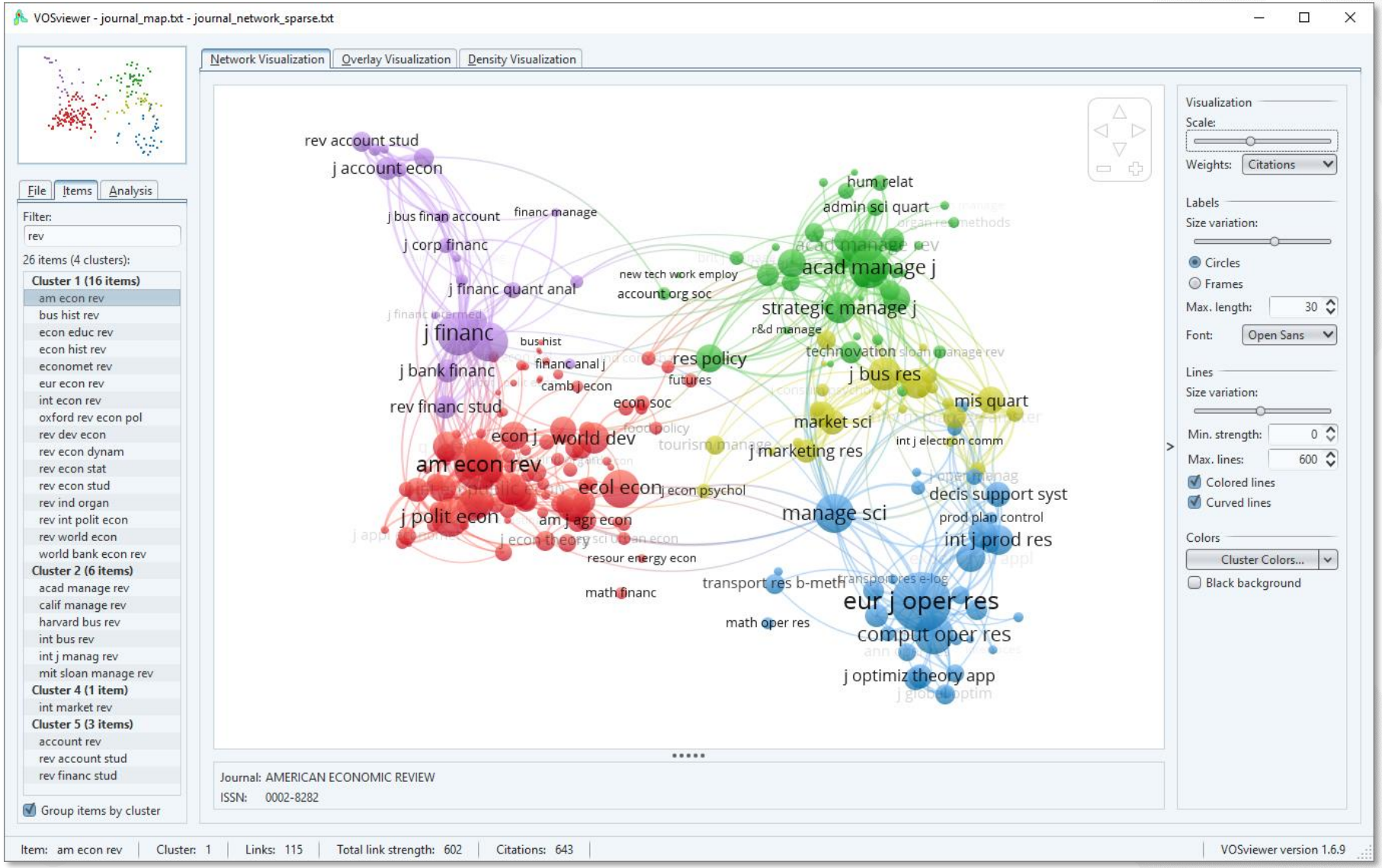
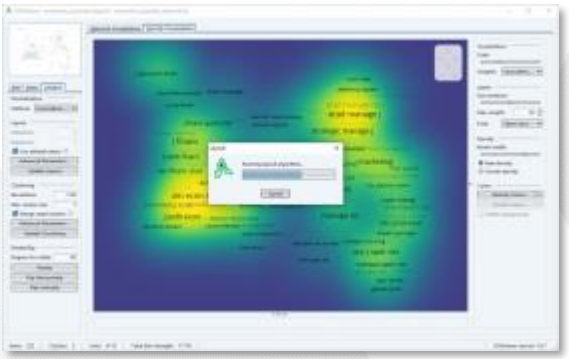
VOSviewer

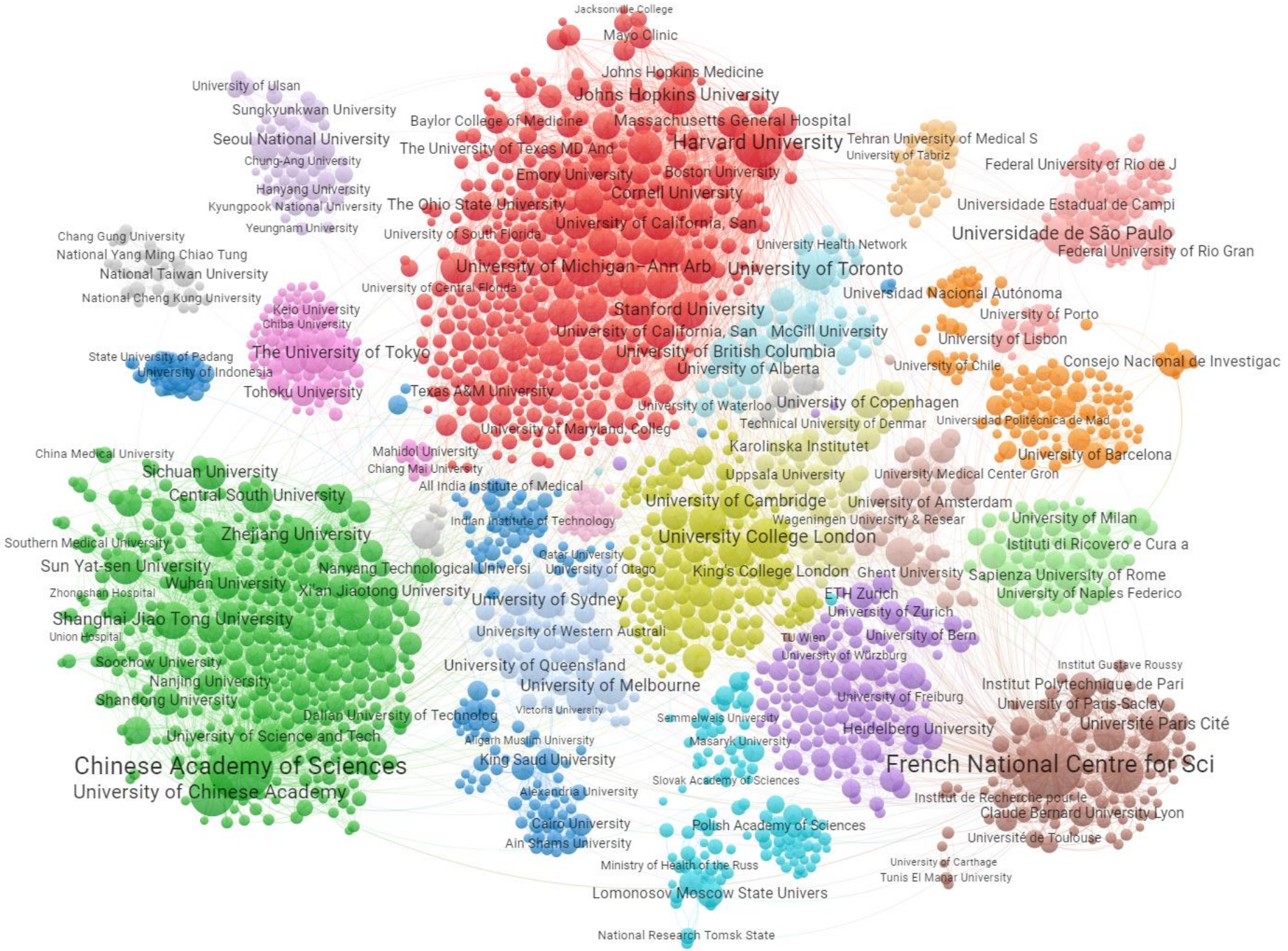

VOSviewer - journal_map.txt - journal_network_sparse.txt
Network Visualization
Overlay Visualization
Density Visualization
File
Items
Analysis
Filter:
rev
26 items (4 clusters):
Cluster 1 (16 items)
am econ rev
bus hist rev
econ educ rev
econ hist rev
economet rev
eur econ rev
int econ rev
oxford rev econ pol
rev dev econ
rev econ dynam
rev econ stat
rev econ stud
rev ind organ
rev int polit econ
rev world econ
world bank econ rev
Cluster 2 (6 items)
acad manage rev
calif manage rev
harvard bus rev
int bus rev
int j manag rev
mit sloan manage rev
Cluster 4 (1 item)
int market rev
Cluster 5 (3 items)
account rev
rev account stud
rev financ stud
Group items by cluster
rev account stud
j account econ
j bus finan account
financ manage
j corp financ
j financ quant anal
new tech work employ
account org soc
j financ
bus hist
financ anal j
j bank financ
camb j econ
res policy
futures
econ soc
rev financ stud
econ j
world dev
am econ rev
ecol econ
j econ psychol
j polit econ
am j agr econ
j econ theory
resour energy econ
math financ
hum relat
admin sci quart
acad manage rev
acad manage j
strategic manage j
r&d manage
technovation
j bus res
mis quart
market sci
int j electron comm
j marketing res
manage sci
decis support syst
prod plan control
int j prod res
transport res b-meth
transport res e-log
eur j oper res
math oper res
comput oper res
j optimiz theory app
Journal: AMERICAN ECONOMIC REVIEW
ISSN: 0002-8282
Visualization
Scale:
Weights: Citations
Labels
Size variation:
Circles
Frames
Max. length: 30
Font: Open Sans
Lines
Size variation:
Min. strength: 0
Max. lines: 600
Colored lines
Curved lines
Colors
Cluster Colors...
Black background
Item: am econ rev
Cluster: 1
Links: 115
Total link strength: 602
Citations: 643
VOSviewer version 1.6.9



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

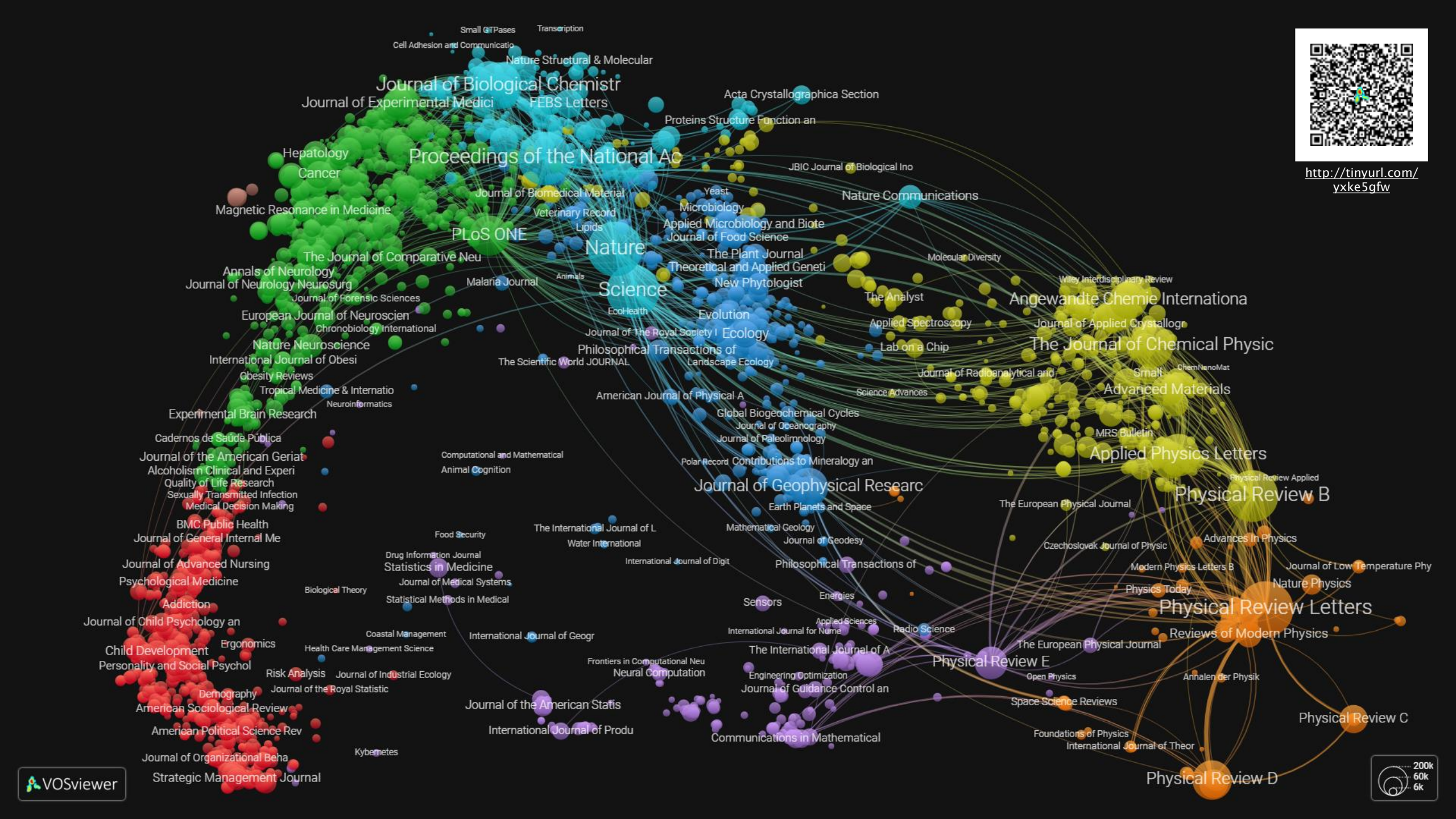
CWTS



http://tinyurl.com/ynd9ad2r

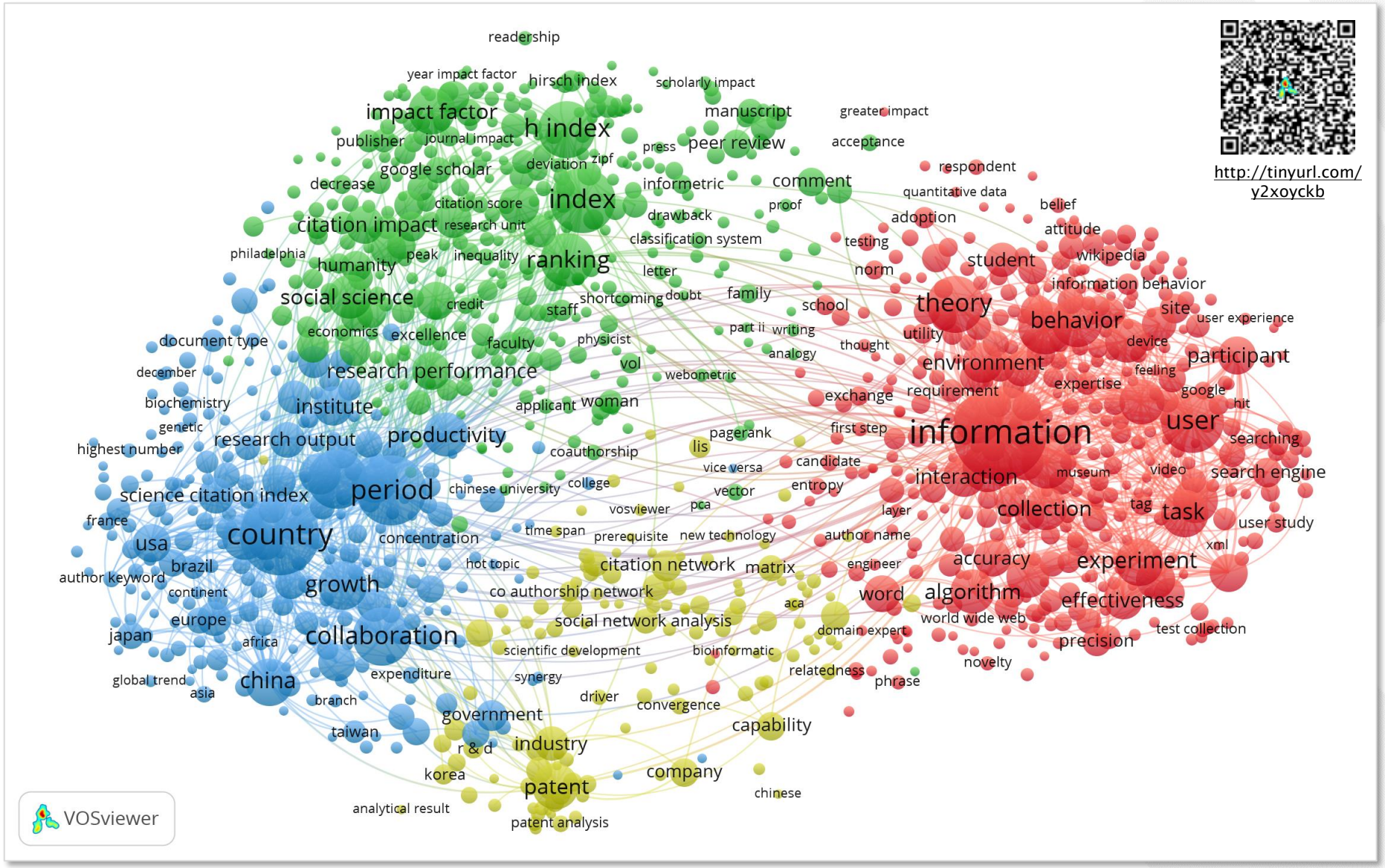
VOSviewer

100k
50k
8k



http://tinyurl.com/yxke5gfw

Text mining



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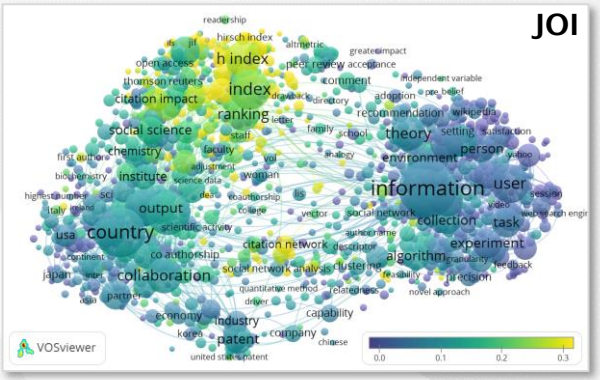
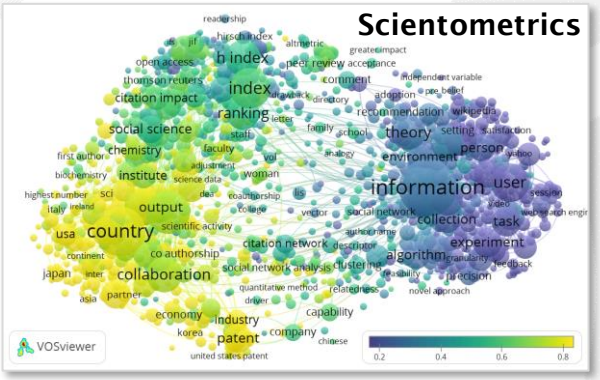
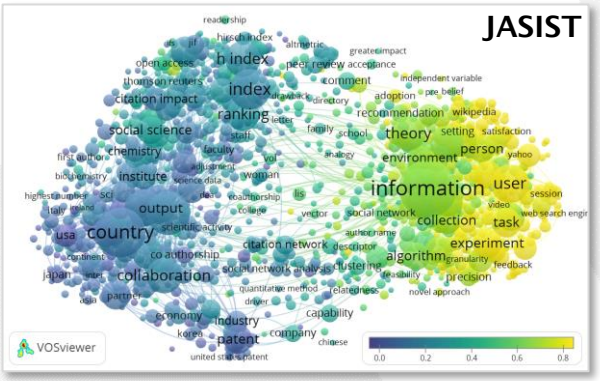
JOI



Scientometrics

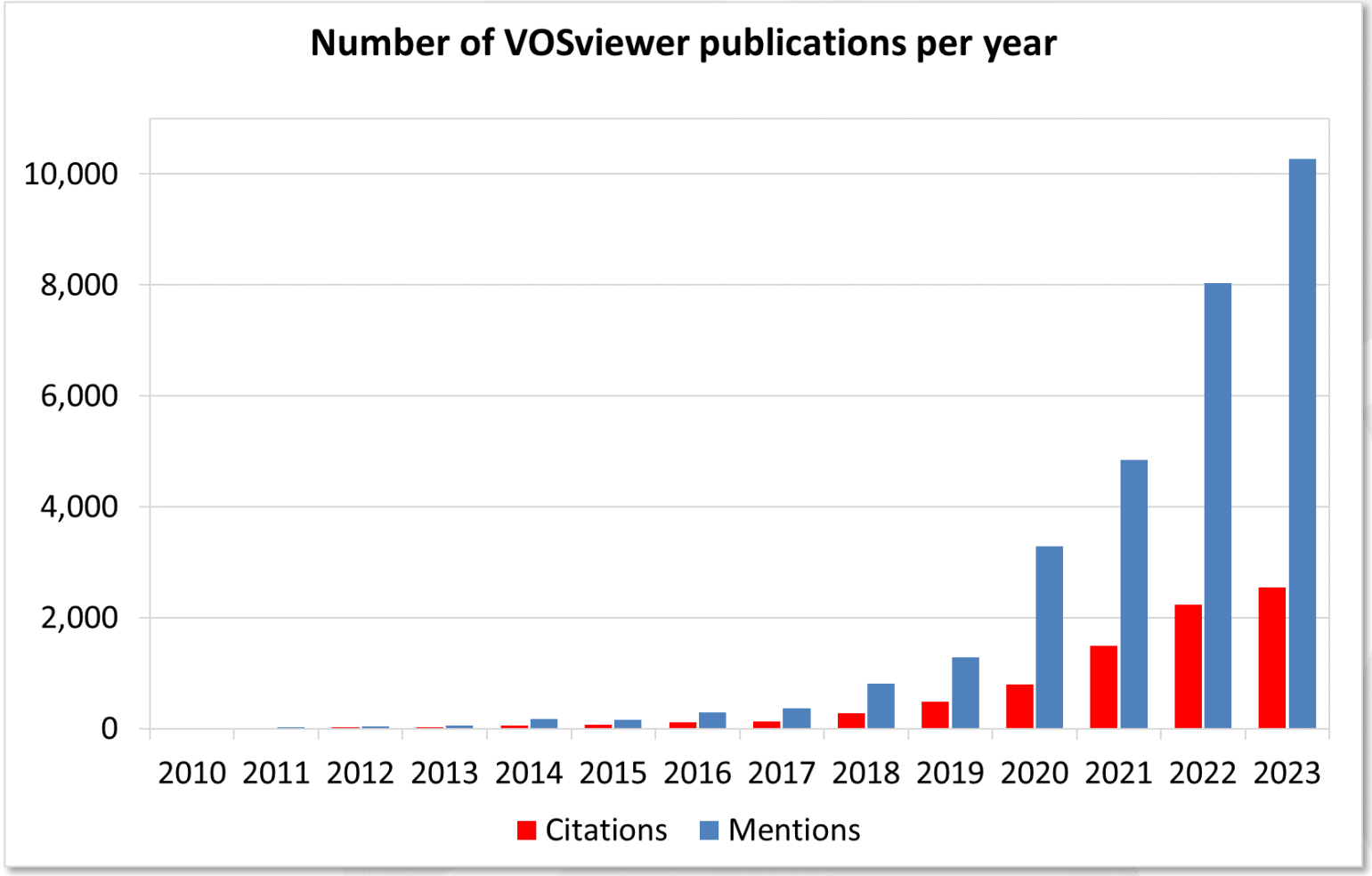


JASIST



Users of VOSviewer

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



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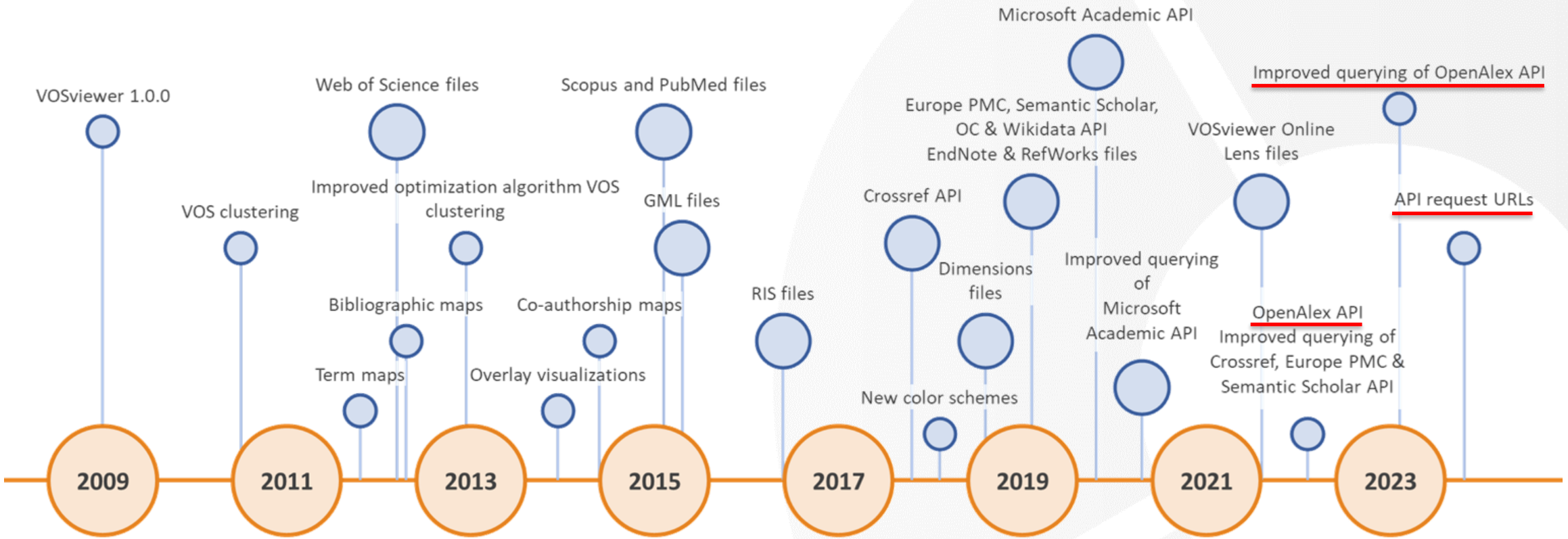
Development



Data sources supported by VOSviewer

OpenAlex

Crossref

Europe PMC

WIKIDATA

PubMed

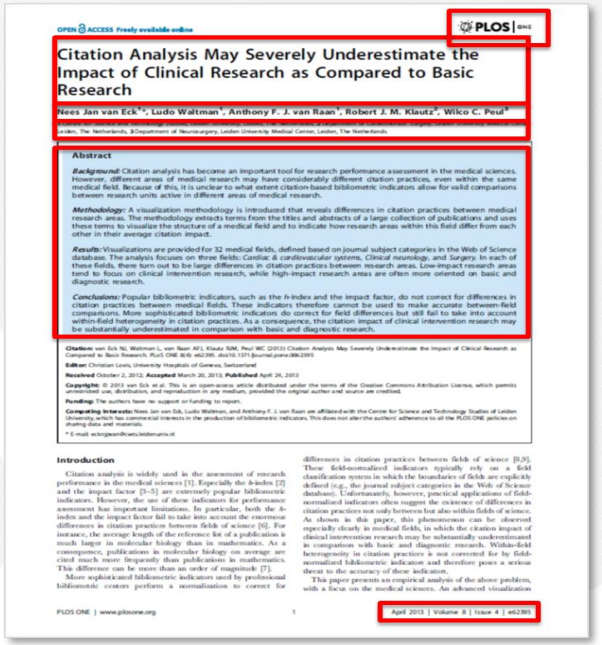
LENS.ORG
Solving The Problem Of Problem Solving™

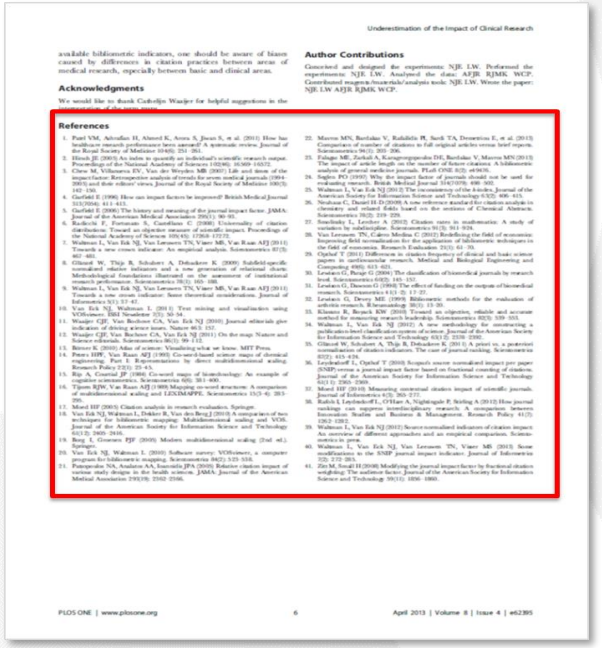
Semantic Scholar

Dimensions

Web of Science

Scopus


Citation Analysis May Severely Underestimate the Impact of Clinical Research as Compared to Basic Research



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

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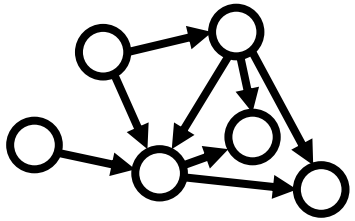
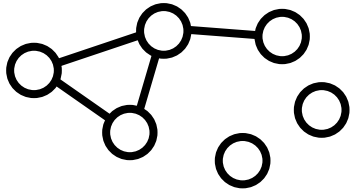
Bibliometric networks in VOSviewer

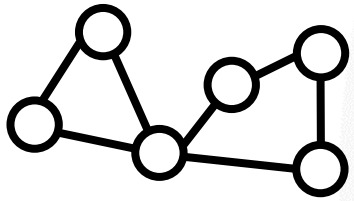
Bibliographic data source



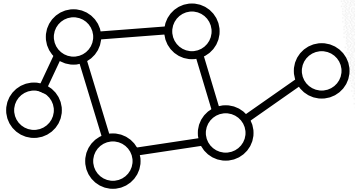
Citation network
of pubs / journals / authors / orgs / countries



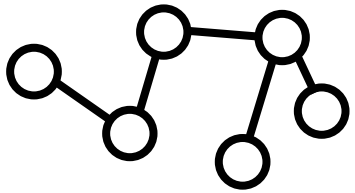
Co-authorship network
of authors / orgs / countries



Co-citation network
of pubs / journals / authors / orgs / countries



Bibliographic coupling network
of pubs / journals / authors



Co-occurrence network
of keywords / terms

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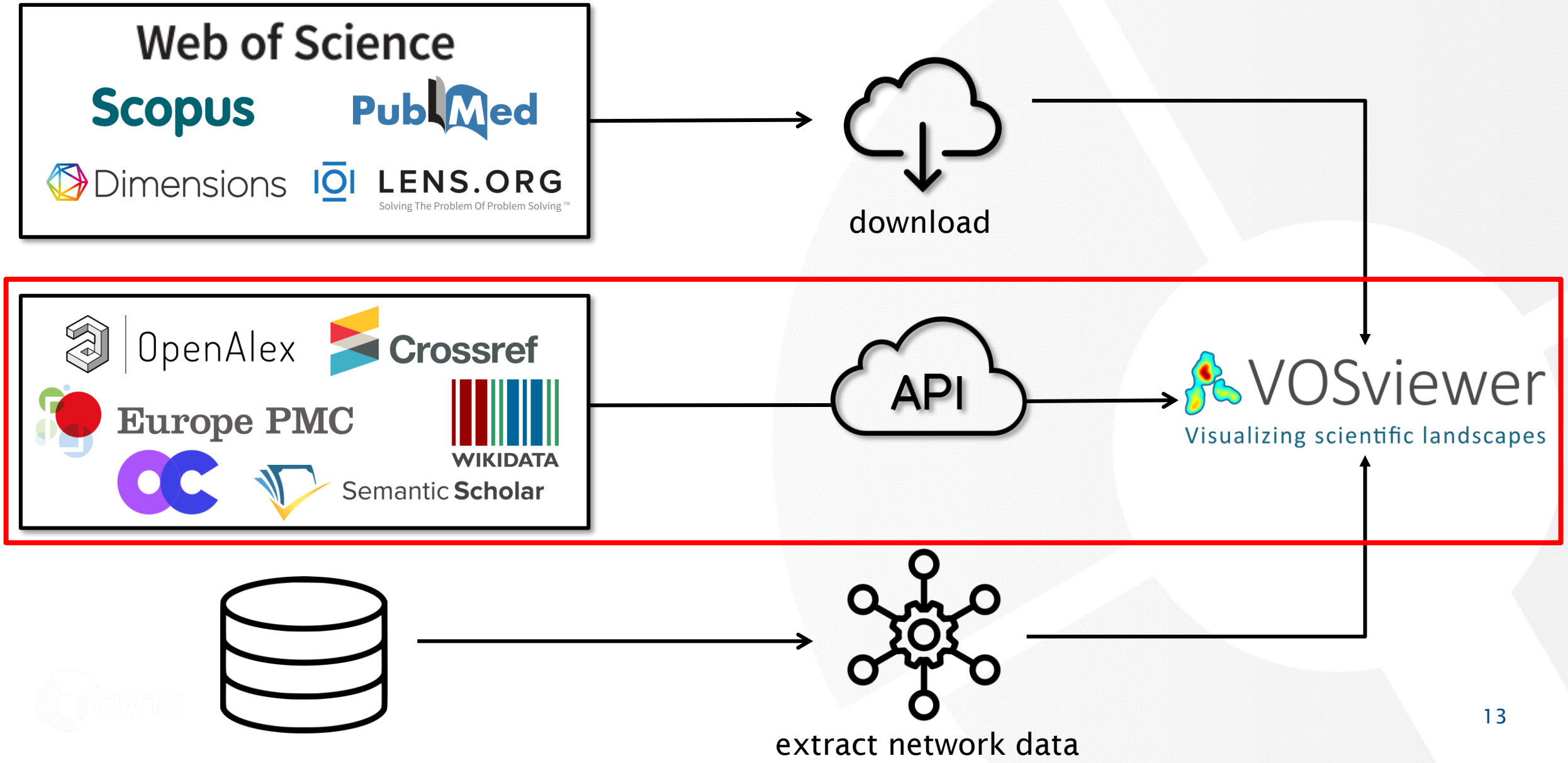
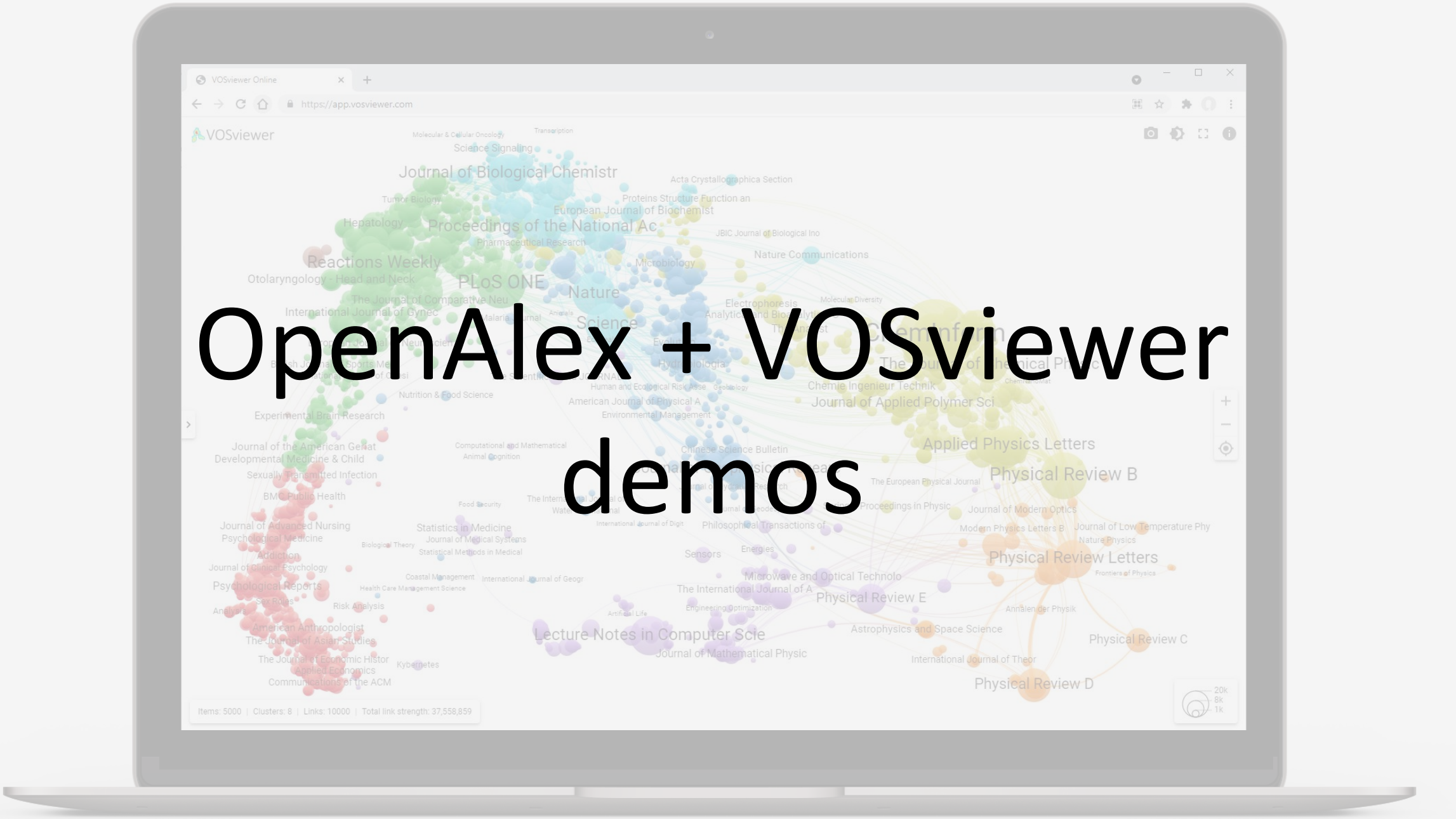
Types of networks supported by each data source

	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

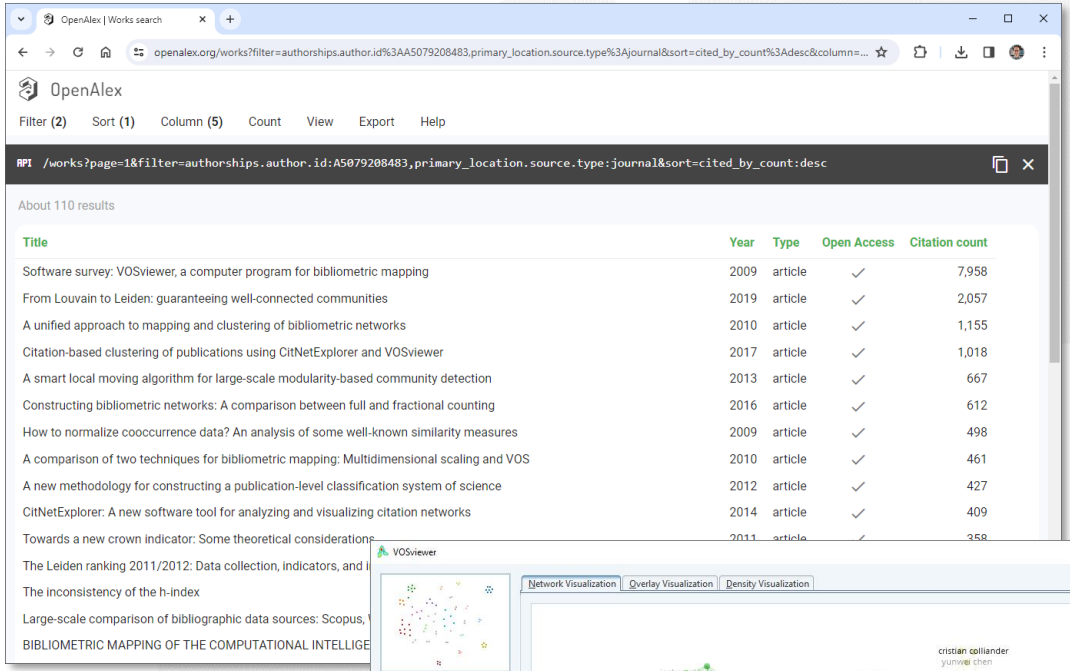

Web of Science
Scopus
PubMed
Dimensions
LENS.ORG
Solving The Problem Of Problem Solving™
download
OpenAlex
Crossref
Europe PMC
WIKIDATA
Semantic Scholar
API
VOSviewer
Visualizing scientific landscapes
extract network data



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



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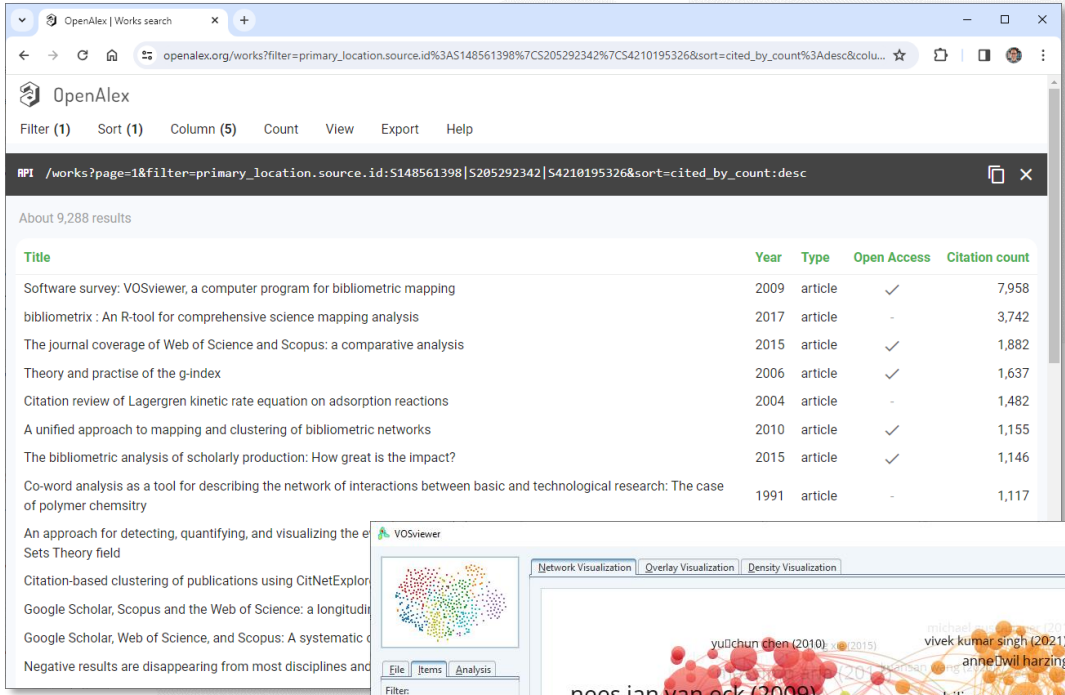
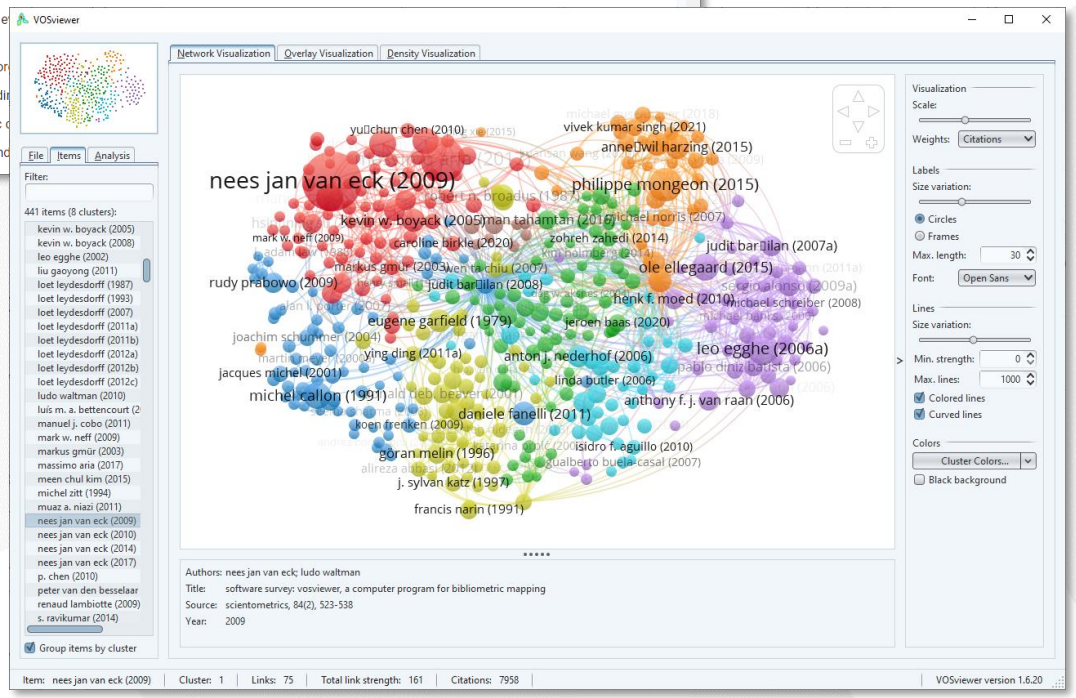
Demo 2: Bibliographic coupling network of highly cited publications

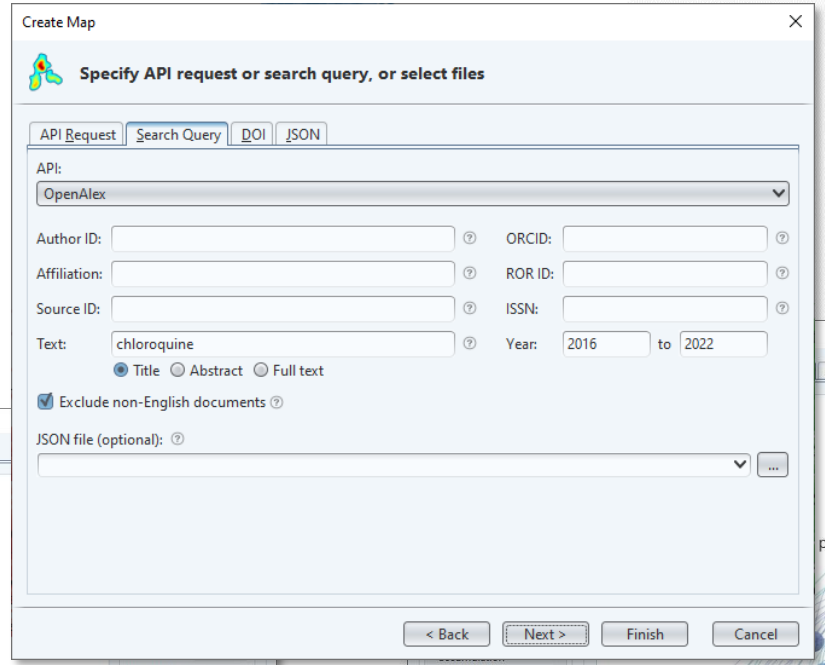
- OpenAlex
  - Filters:
    - Sources: Scientometrics OR Journal of Informetrics OR Quantitative Science Studies
- VOSviewer
  - API: OpenAlex
  - API request URL: https://api.openalex.org/works?page=1&filter=primary_location.source.id:S148561398|S205292342|S4210195326&sort=cited_by_count:desc

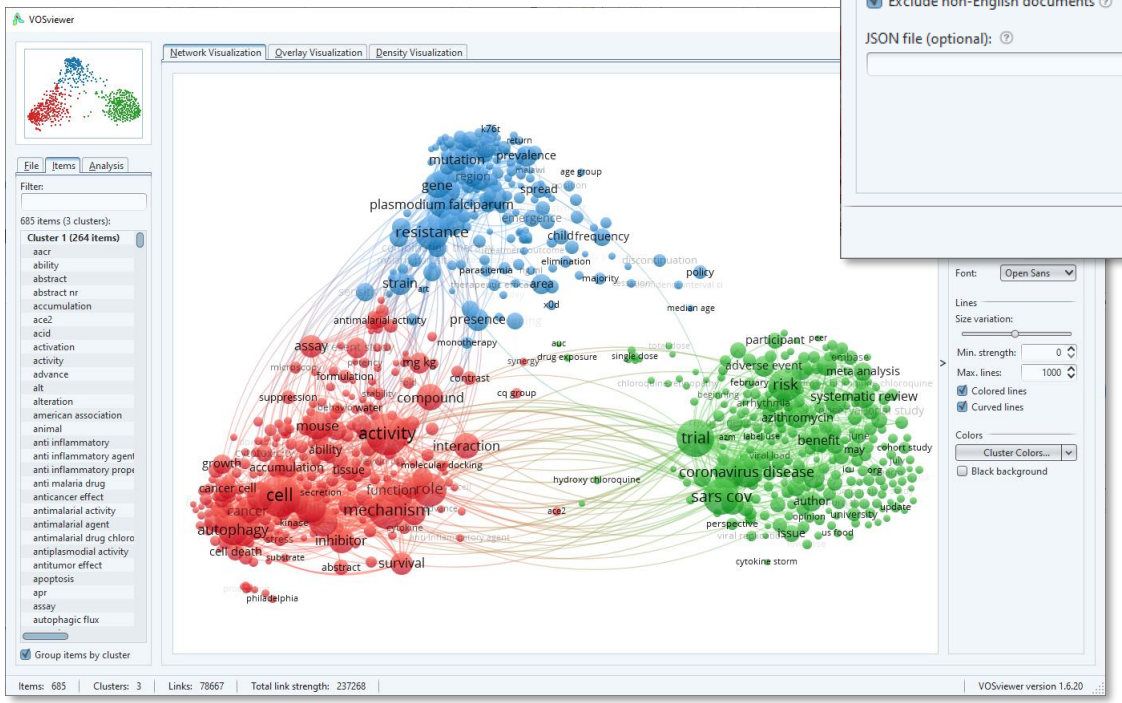


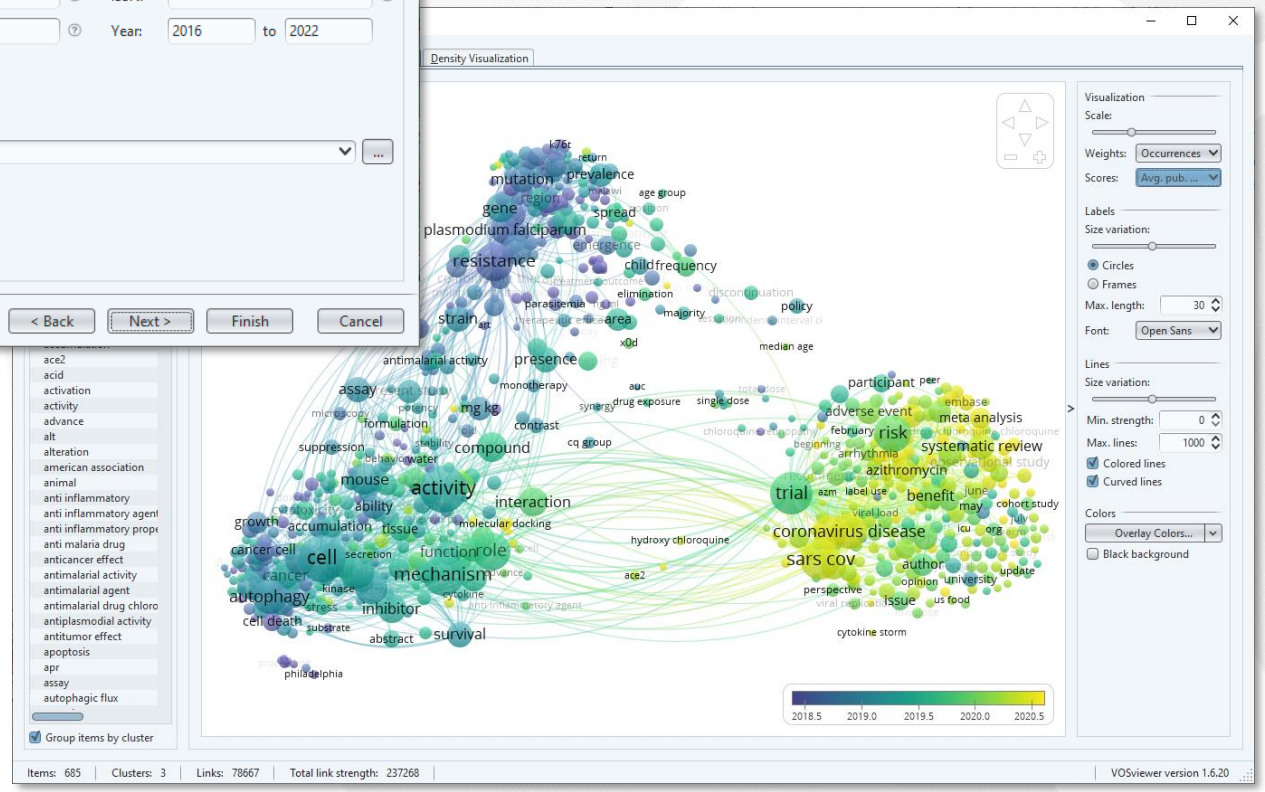


Demo 3: Co-occurrence network of terms extracted from a set of related publications

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

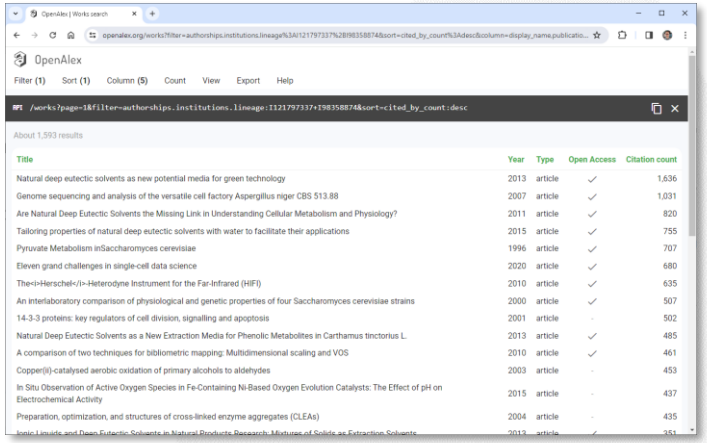


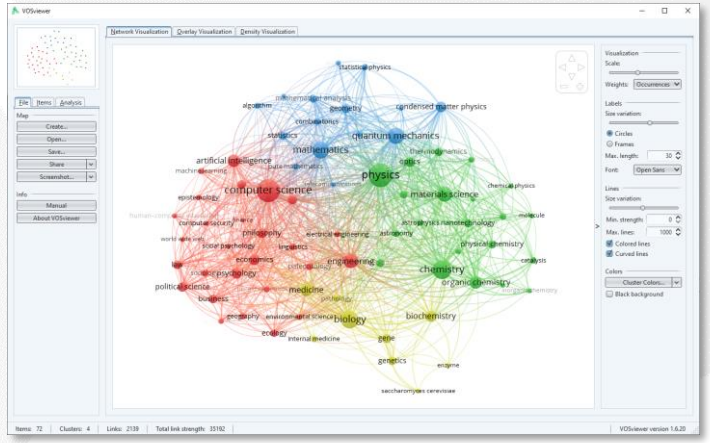


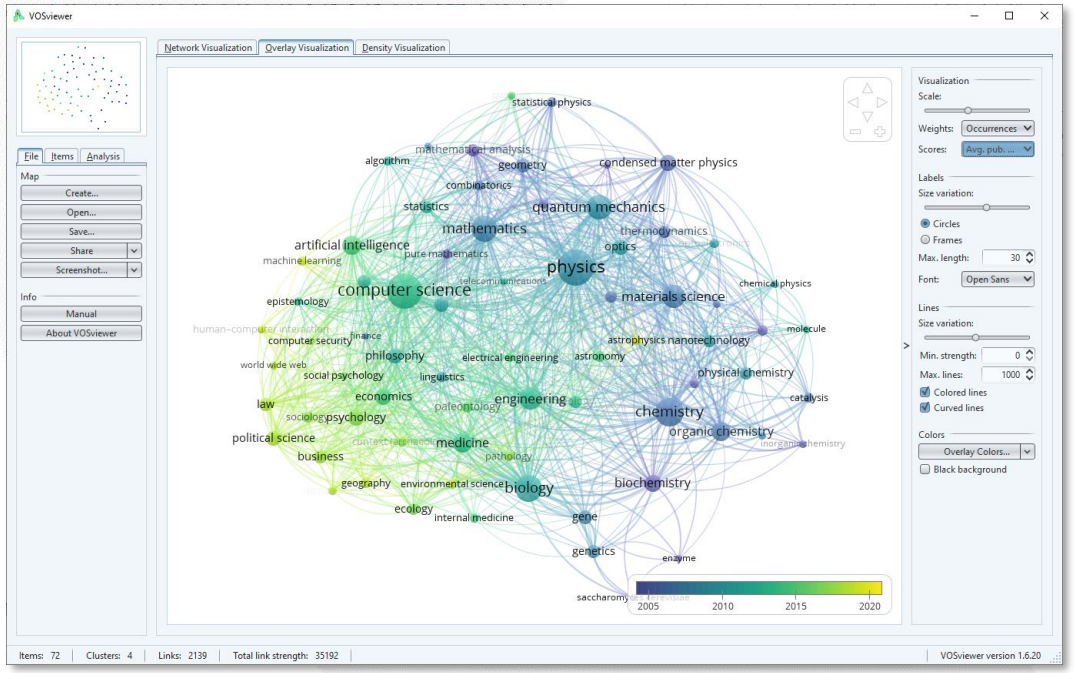


Demo 4: Co-occurrence network of concepts based on a set of collaborative publications

- 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.lineage:I98358874+I121797337&sort=cited_by_count:desc

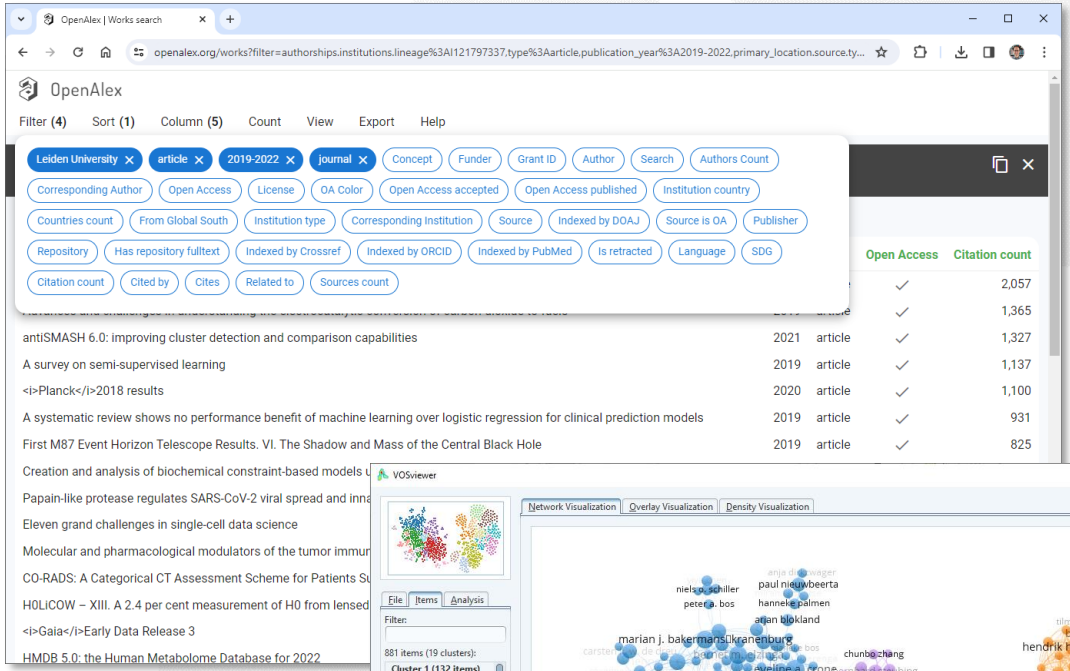






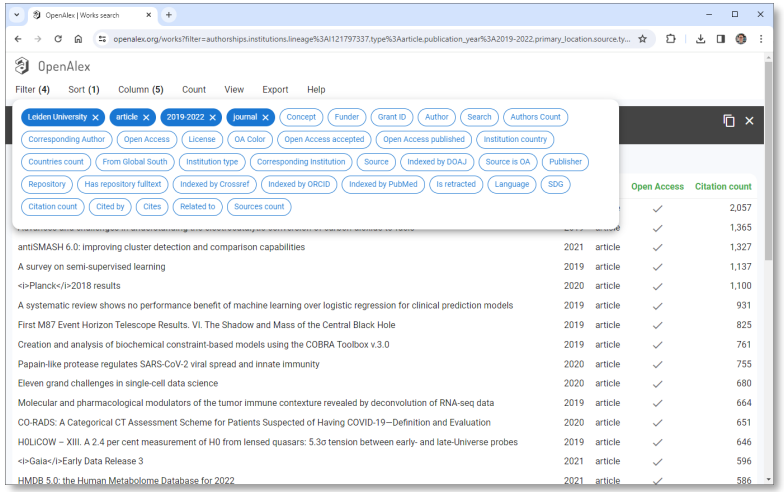
Demo 5: Co-authorship network of researchers of a university and their collaborators

- 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:I121797337,publication_year:2019-2022,type:article,primary_location.source.type:journal&sort=cited_by_count:desc



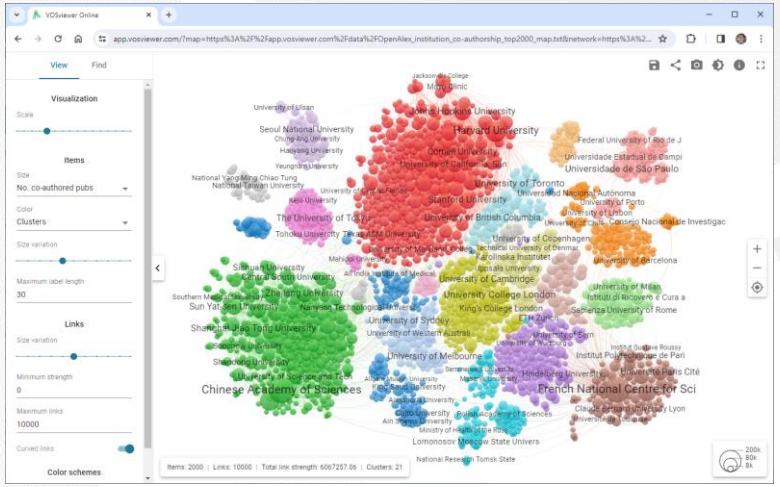
Do it yourself!

openalex.org



www.vosviewer.com

app.vosviewer.com



Thank you for your attention!

Q&A