

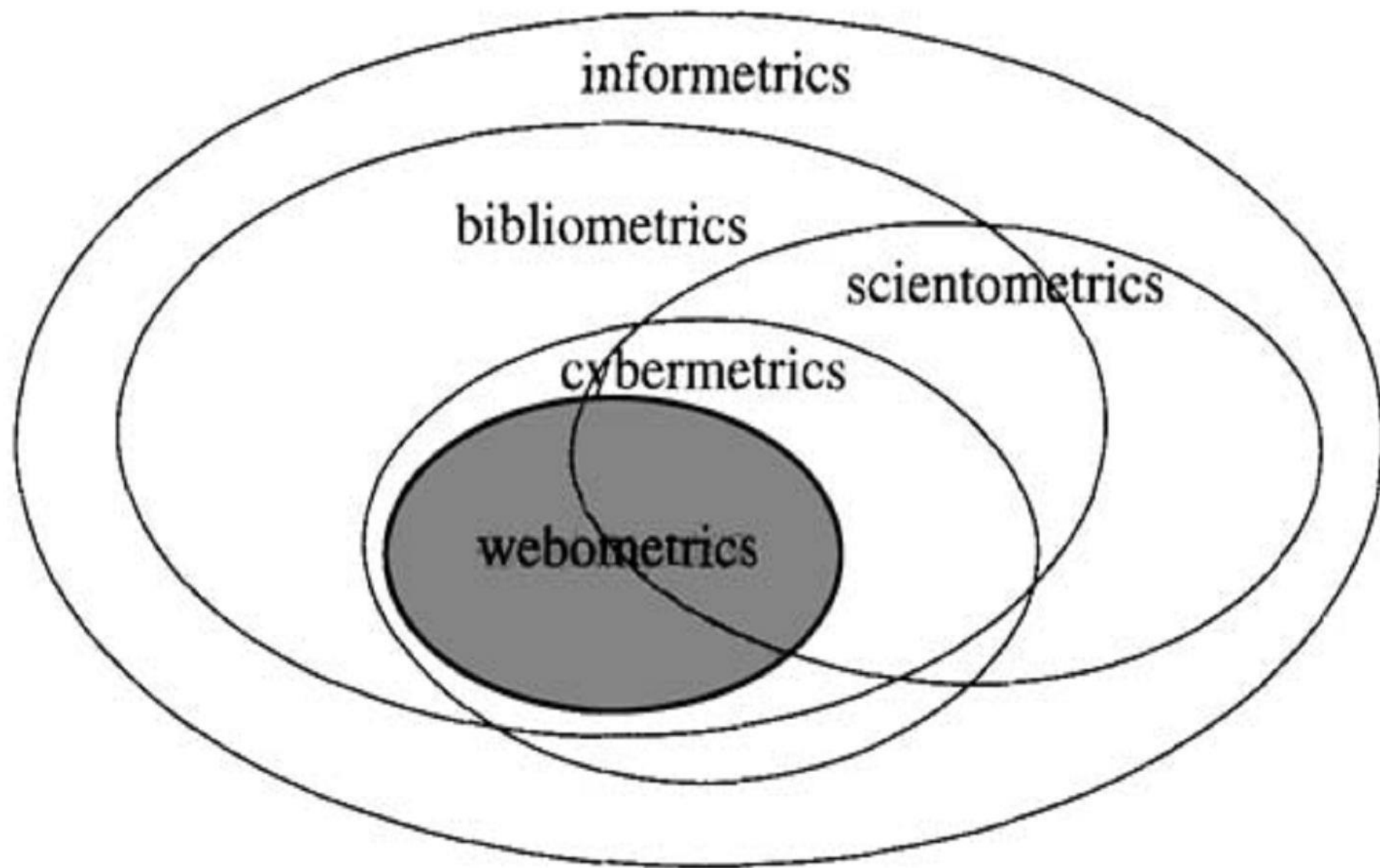
Trend metrics

History

- سابقه این علم به دهه هفتاد میلادی برمی گردد. نقطه شروع و شکل گیری این علم در روسیه شوروی بود
- پژوهشهای محاصر بر اساس فرایند اندازه گیری در حوزه اطلاع رسانی تدوین شده اند
- هم چنین برای ارزیابی و رتبه بندی سازمان های پژوهشی و دانشگاهها نیز شاخصهای علم سنجی مورد استفاده قرار میگیرند.

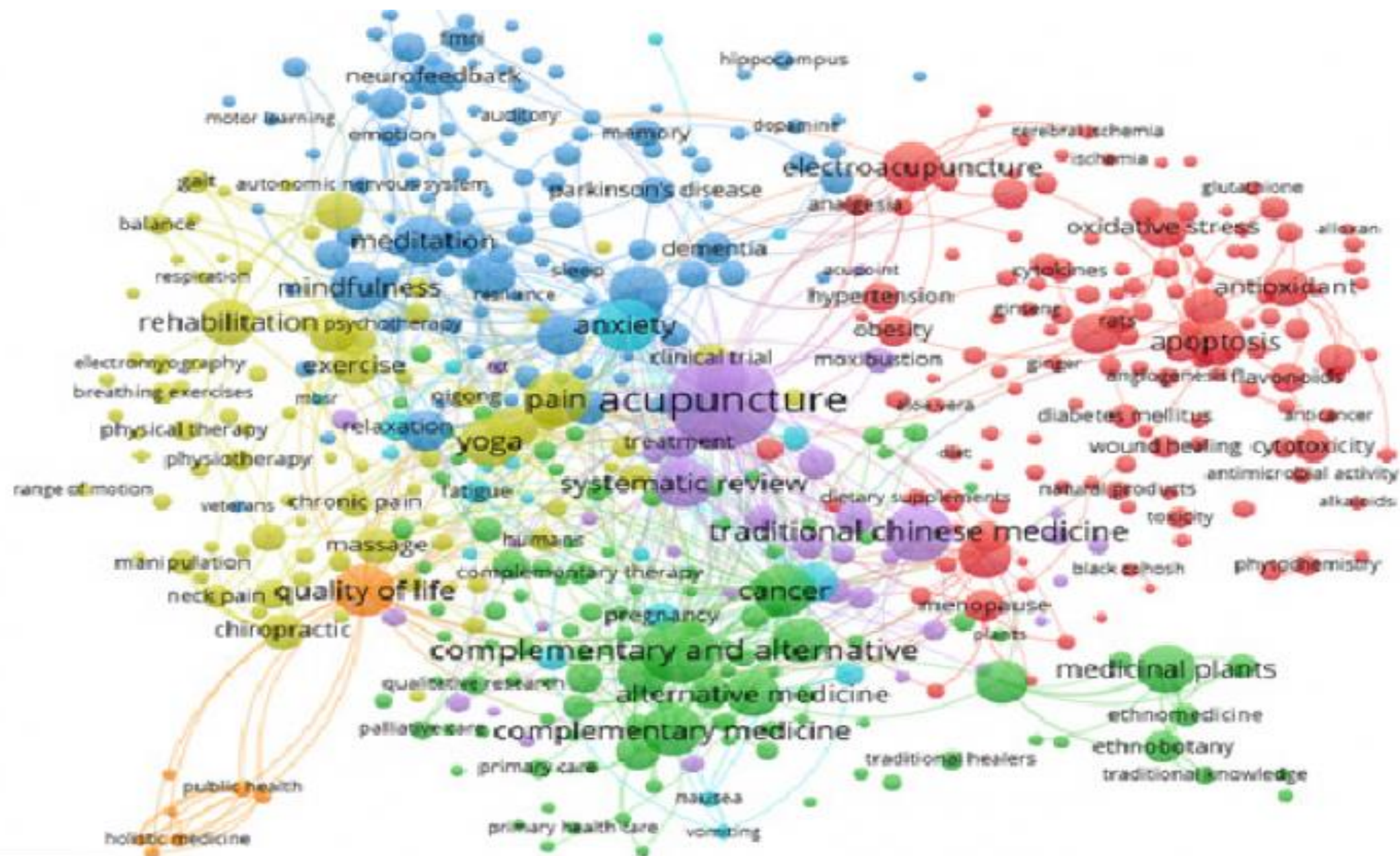
Metric studies

- **Bibliometrics:** is the use of statistical methods to analyze books, articles and other publications. The sub-field of bibliometrics which concerns itself with the analysis of scientific publications is called [scientometrics](#).
- **Scientometrics:** is the field of study which concerns itself with measuring and analysing scholarly literature. Scientometrics is a sub-field of [bibliometrics](#). Major research issues include the measurement of the impact of research papers and academic journals, the understanding of scientific citations, and the use of such measurements in policy and management contexts.
- **Webometrics:** is a quantitative analysis of web phenomena, which includes link analysis, web citation analysis, search engines etc
- **Altmetrics:** It is alternative methods of measuring the resources through social networking sites. Eg: citation metrics
- **Infometrics:** an interdisciplinary approach to scientific modeling, inference and efficient information processing. It is the science of modeling, reasoning, and drawing inferences under conditions of noisy and limited information



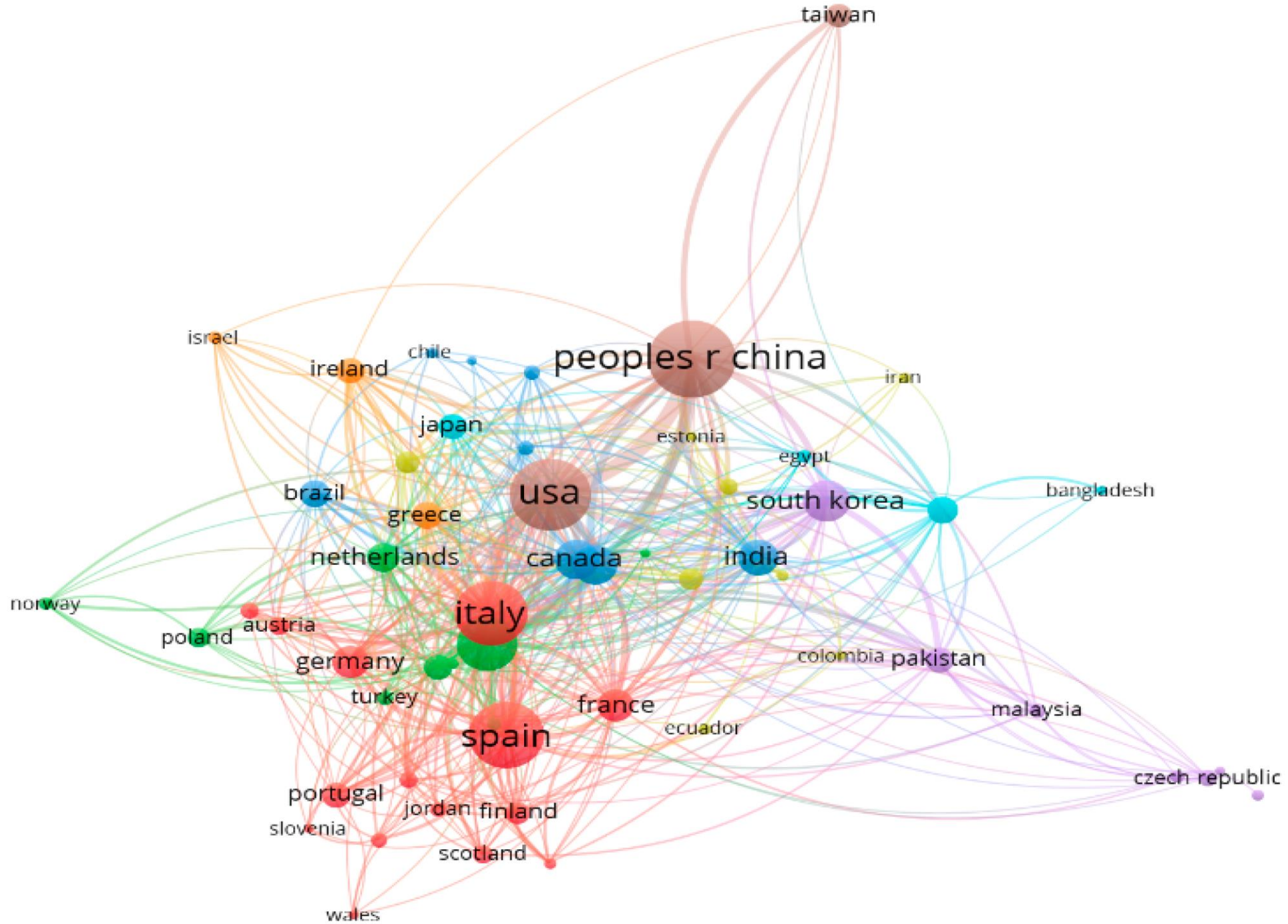
Bibliometrics

- Bibliometrics is a study or measurement of format aspects of
- texts,
- documents,
- books and information



Scientometrics

- **Scientometrics** is the field of study which concerns itself with measuring and analysing scholarly literature. Scientometrics is a sub-field of [bibliometrics](#). Major research issues include the measurement of the impact of research papers and academic journals, the understanding of scientific citations, and the use of such measurements in policy and management contexts.



Altmetrics

- Tweets
- Blog mentions
- Face book
- Presentations
- News articles
- Shared citations and
- Data uploads

webometrics

- The five categories of metrics. Such as
- Usage e.g., downloads
- Captures, e.g., bookmarks,
- Mentions, e.g., blogs,
- Social Media, e.g., tweets, and
- Citations, e.g., Scopus

کاربردهای علم سنجی

1. ترسیم حرکت و پویایی علم (کالون و همکاران، ۱۹۸۶)؛
2. ترسیم ساختار حوزه‌ها و زمینه‌های علمی (وایتاکر، ۱۹۸۹)؛
3. ترسیم روابط میان تحقیقات بنیانی و تحقیقات فناورانه (کالون و همکاران، ۱۹۹۱)؛
4. دیداری‌سازی شبکه مفهومی علم و فناوری (سالمی و کوشا، ۱۳۹۲)؛
5. تحلیل سیر تحول مفهومی در طول دوره‌های زمانی؛

1. تعیین و تحلیل نواحی مورد پژوهش؛

2. ارزیابی درون داد و برون داد روابط در یک شبکه پژوهشی؛

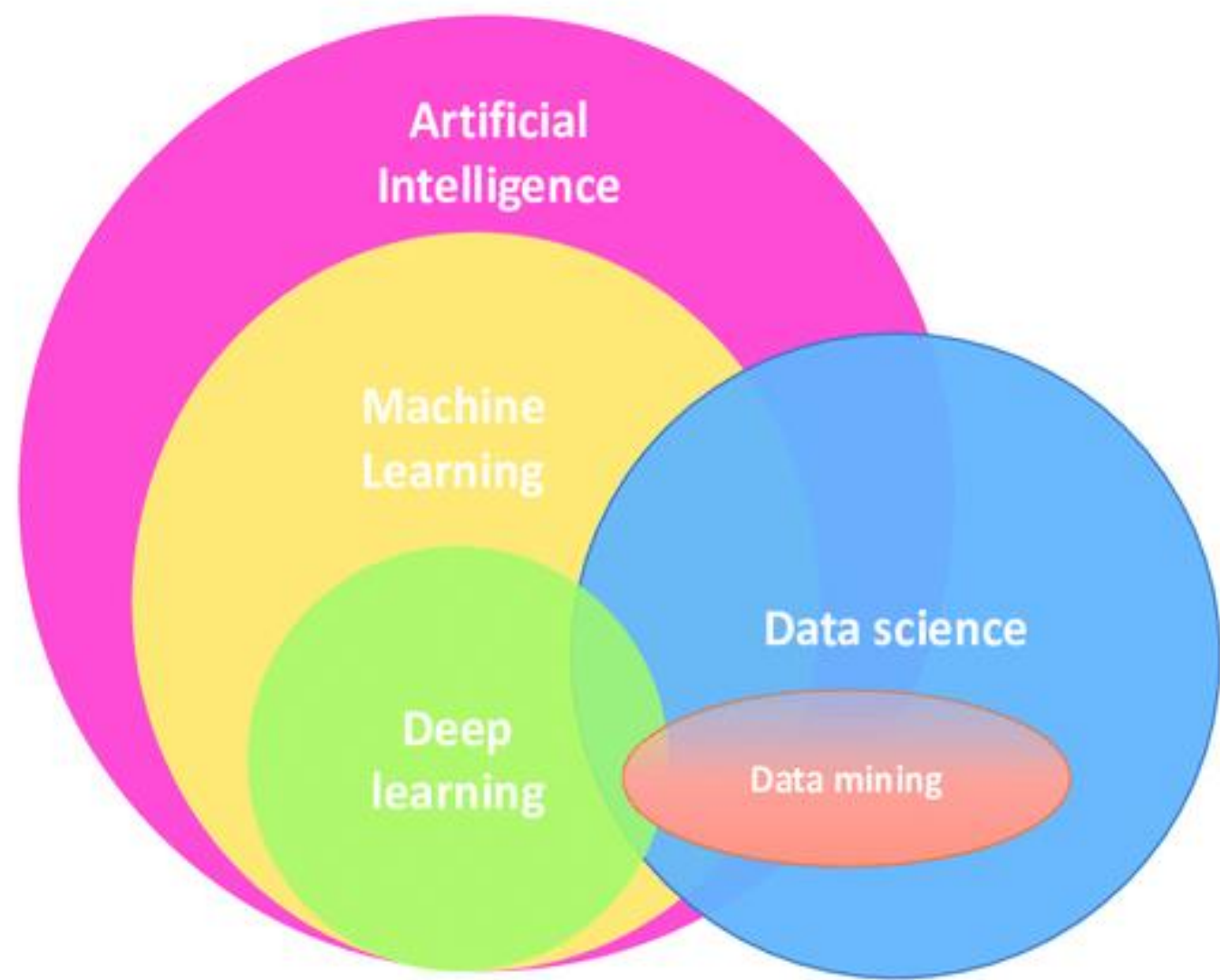
3. دسته‌بندی مدارک بر اساس موضوعات؛

4. خوشه‌بندی مفاهیم حوزه‌های علمی (احمدی و عصاره، ۱۳۹۶)؛

5. درک و کشف روابط پنهان در حوزه‌های علوم؛

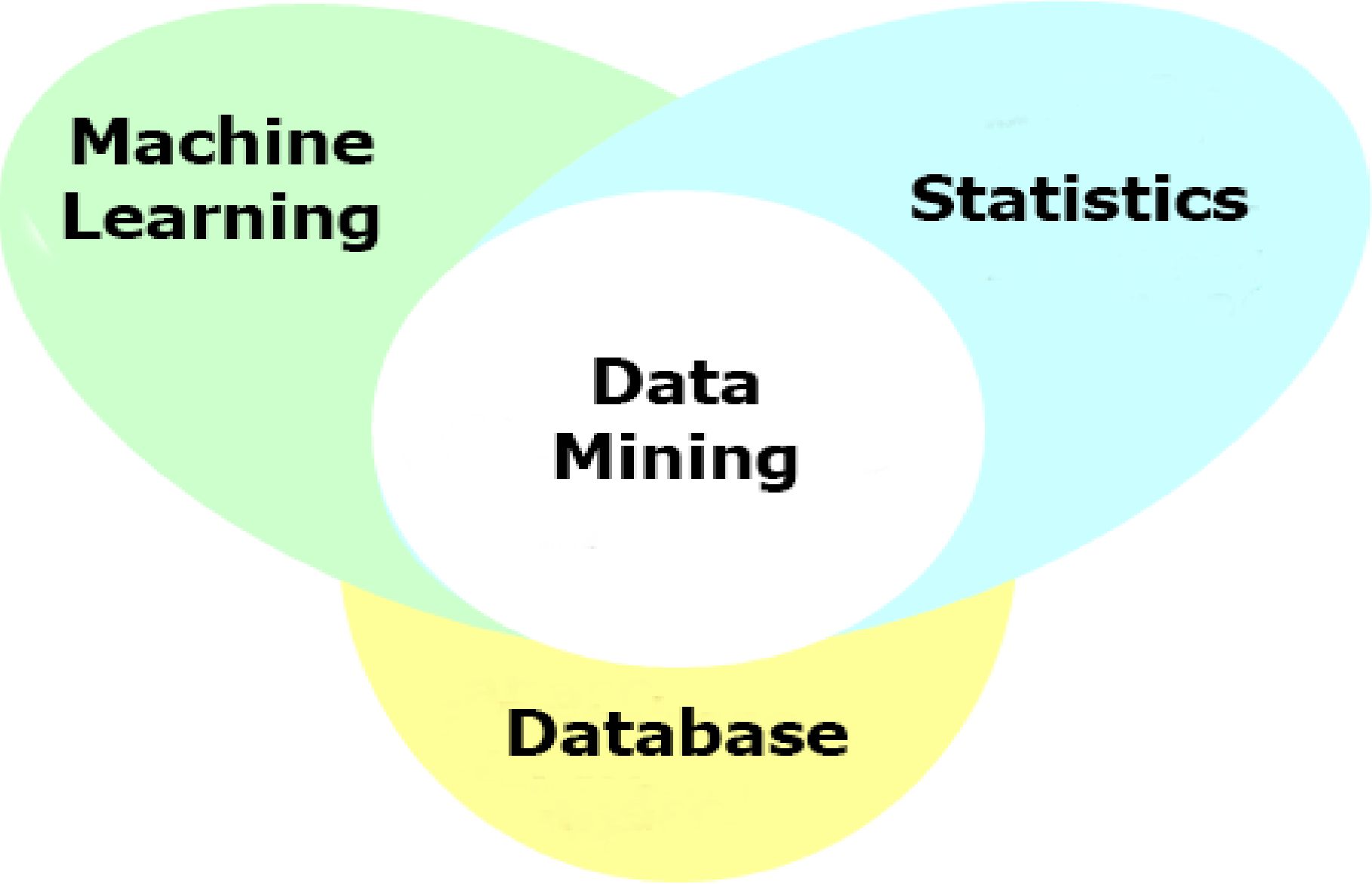
6. کشف الگوهای برجسته و رویدادهای در حال ظهور (احمدی و عصاره، ۱۳۹۶)؛

• تعیین روابط سلسله مراتبی مفاهیم یک حوزه یا یک زمینه خاص علمی (احمدی و عصاره، ۱۳۹۶)



Data mining

- **Data mining** is a process of extracting and discovering patterns in large [data sets](#) involving methods at the intersection of [machine learning](#), [statistics](#), and [database systems](#)



A Venn diagram illustrating the relationship between four fields: Machine Learning, Statistics, Database, and Data Mining. The diagram consists of three overlapping circles. The top-left circle is green and labeled 'Machine Learning'. The top-right circle is light blue and labeled 'Statistics'. The bottom circle is yellow and labeled 'Database'. The central area where all three circles overlap is white and labeled 'Data Mining'. The text is in a bold, black, sans-serif font.

Machine Learning

Statistics

Data Mining

Database

Digital image processing

- **Digital image processing** is the use of a [digital computer](#) to process [digital images](#) through an [algorithm](#). As a subcategory or field of [digital signal processing](#), digital image processing has many advantages over [analog image processing](#). It allows a much wider range of algorithms to be applied to the input data and can avoid problems such as the build-up of [noise](#) and [distortion](#) during processing. Since images are defined over two dimensions (perhaps more) digital image processing may be modeled in the form of [multidimensional systems](#).

Digital Image Processing

Original



Processed



Processing

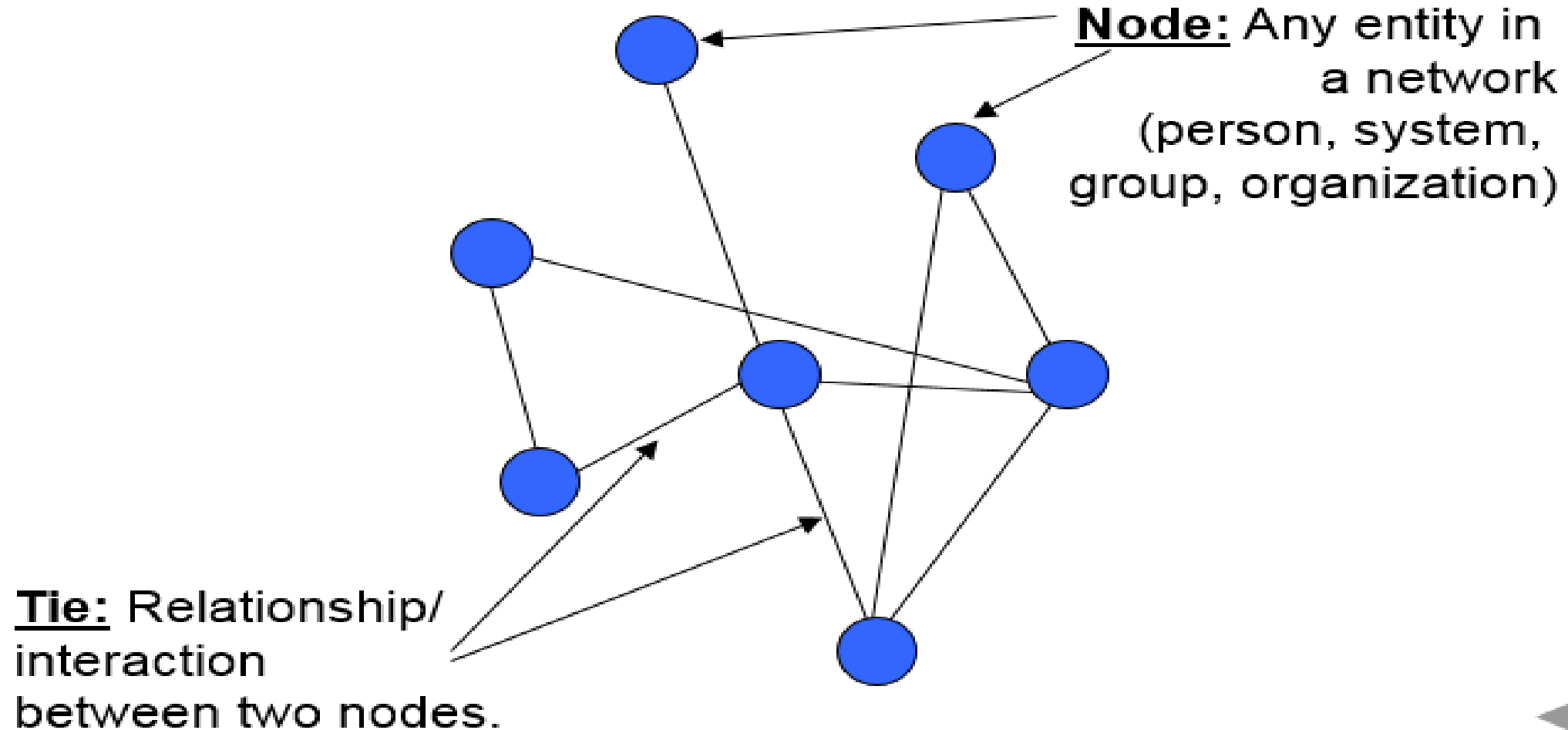
Sprawls

Network analysis

- is the process of investigating social structures through the use of [networks](#) and [graph theory](#).^[1]
- It characterizes networked structures in terms of *nodes* (individual actors, people, or things within the network) and the *ties*, *edges*, or *links* (relationships or interactions) that connect them

Social Network Analysis:

Focus on *interactions* between individuals/
groups



Outline

Small Worlds

Random Graphs

Alpha and Beta

Power Laws

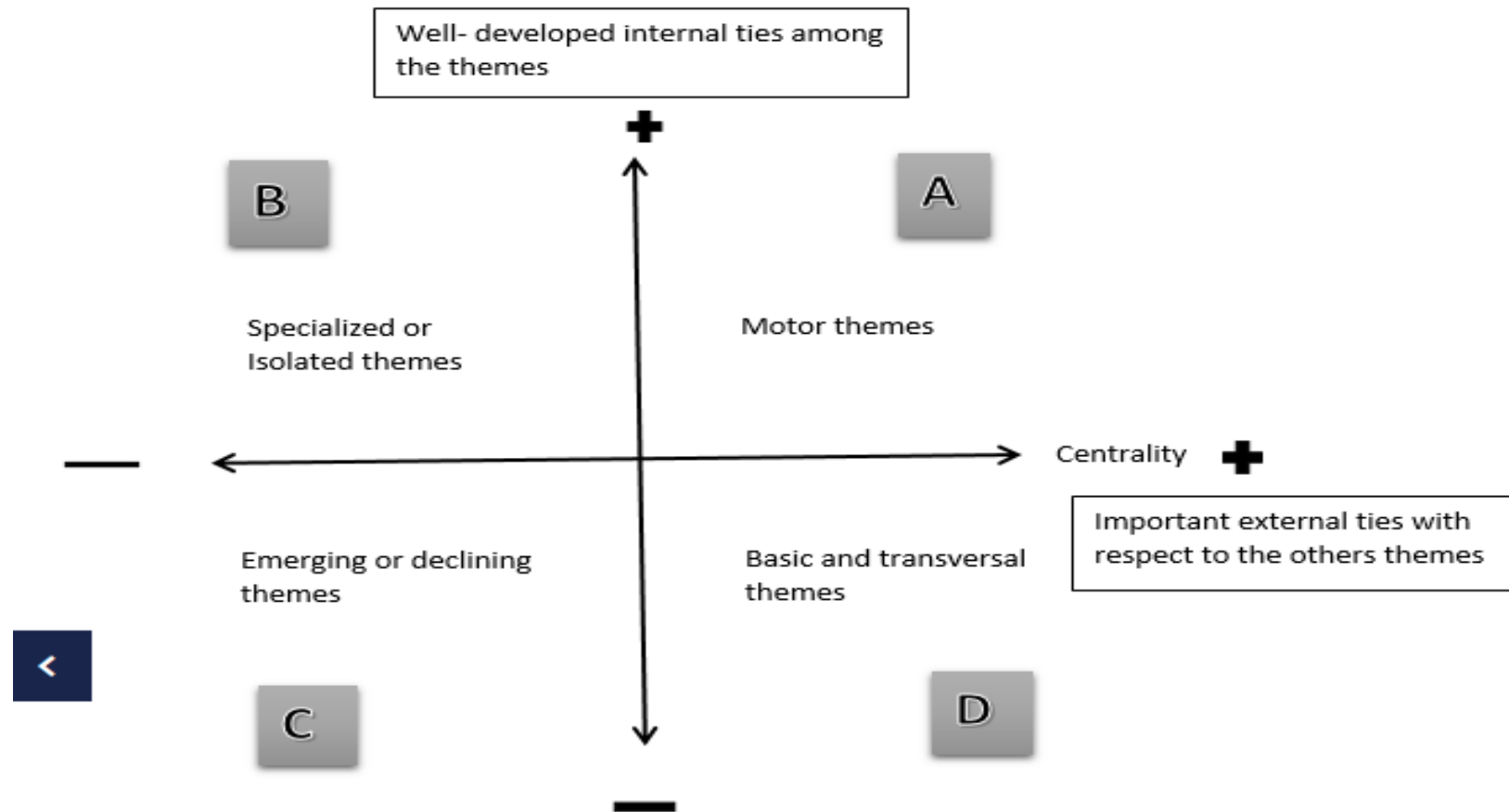
Searchable Networks

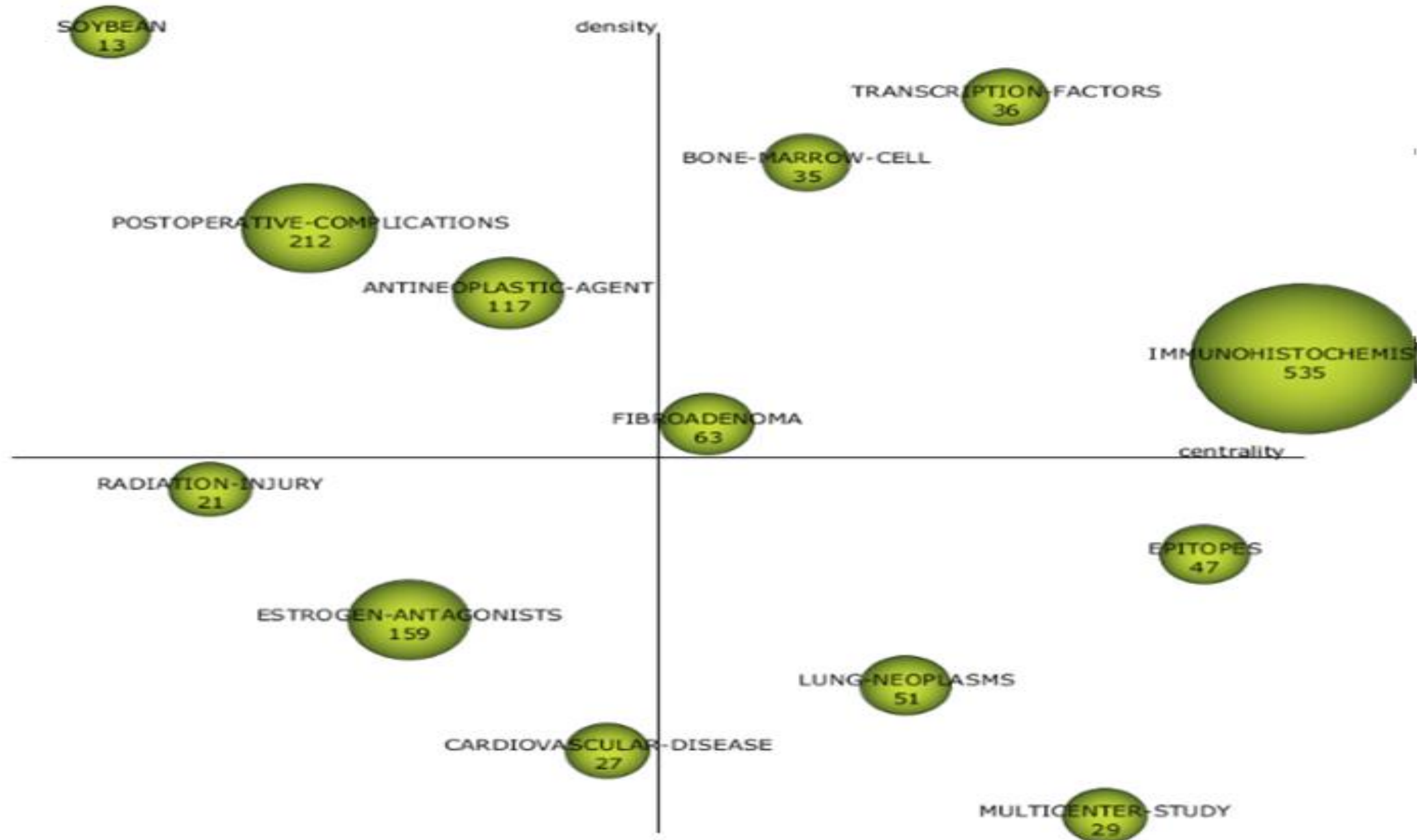
Six Degrees of Separation

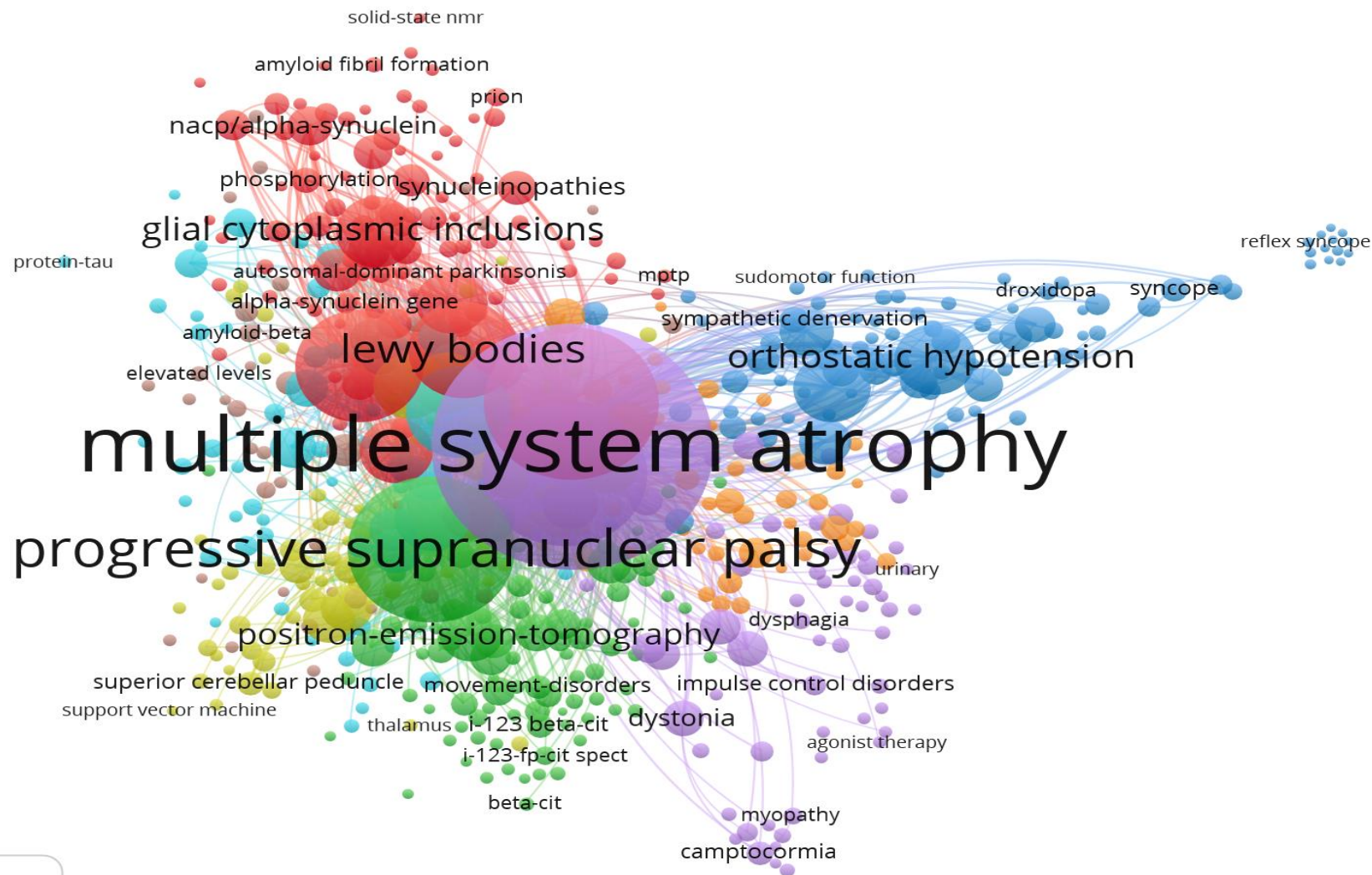
Visualizing is...

- A reading strategy
- A way to help you understand what you read
- An important tool for reading fiction and nonfiction
- - Making a picture in your mind

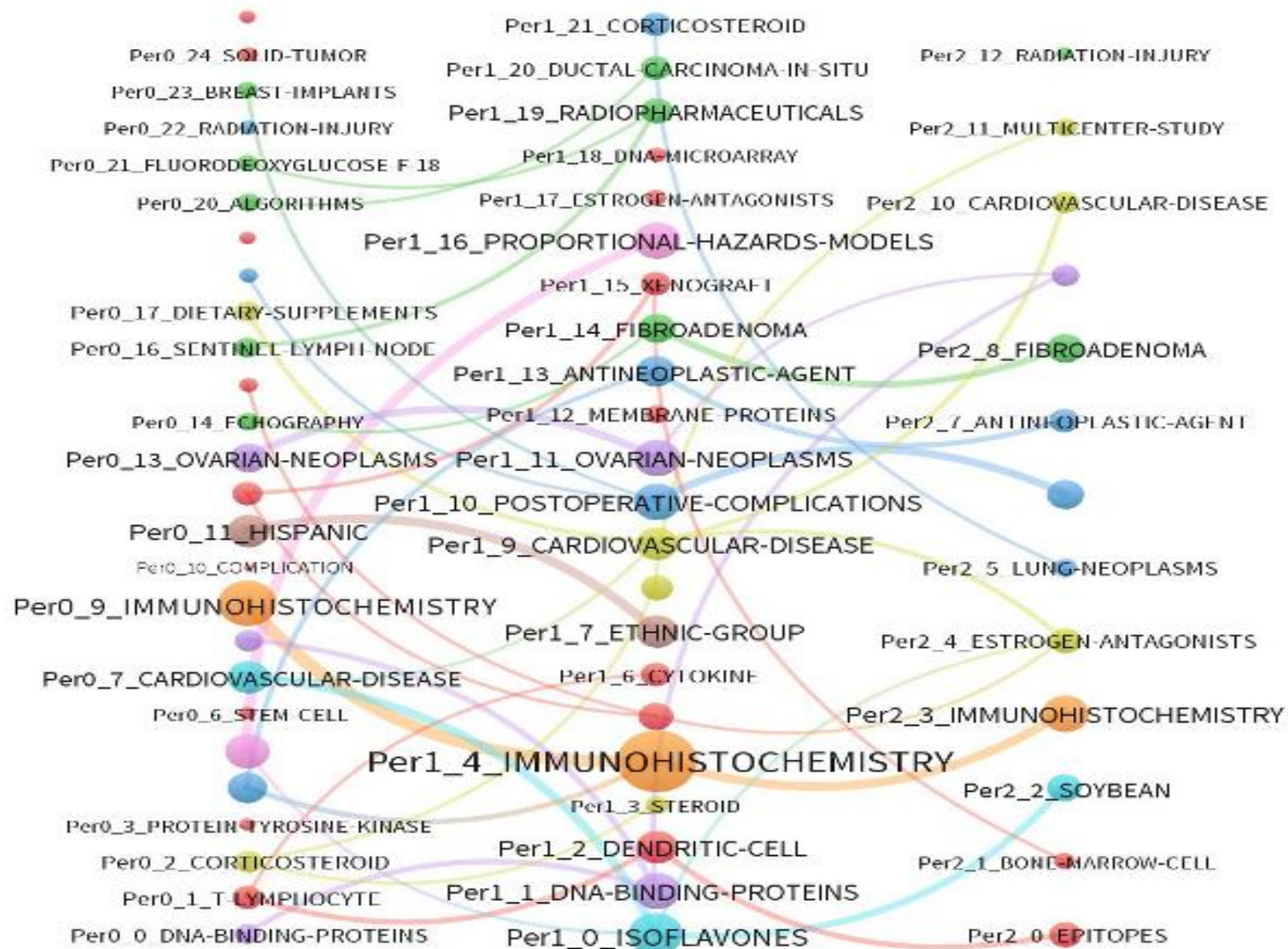
Centrality and density





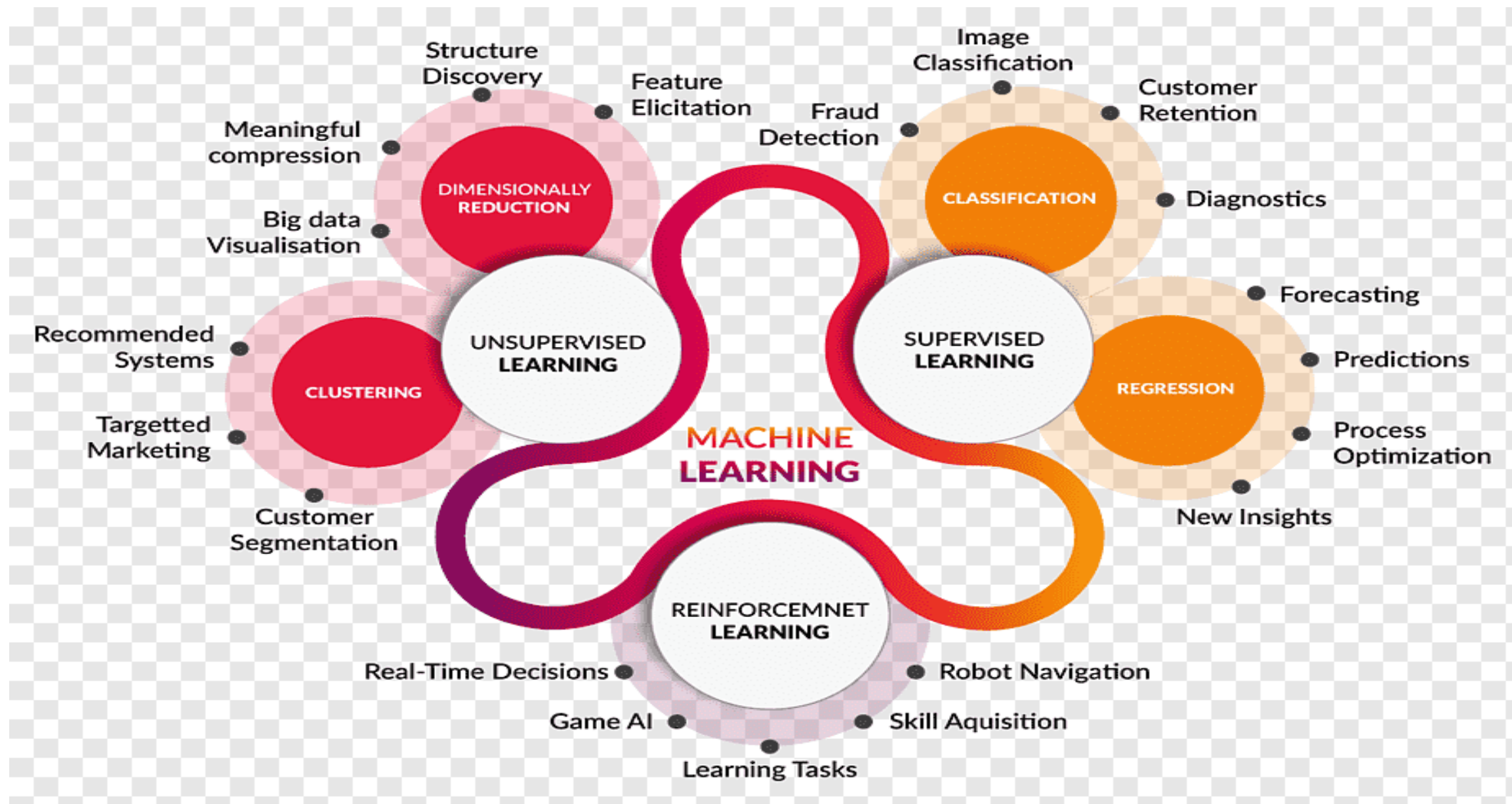


VOSviewer



Machine learning

- **Supervised learning (SL)** is the [machine learning](#) task of learning a function that [maps](#) an input to an output based on example input-output pairs
- **Supervised learning**
([classification](#) • [regression](#))
- Un supervised learning

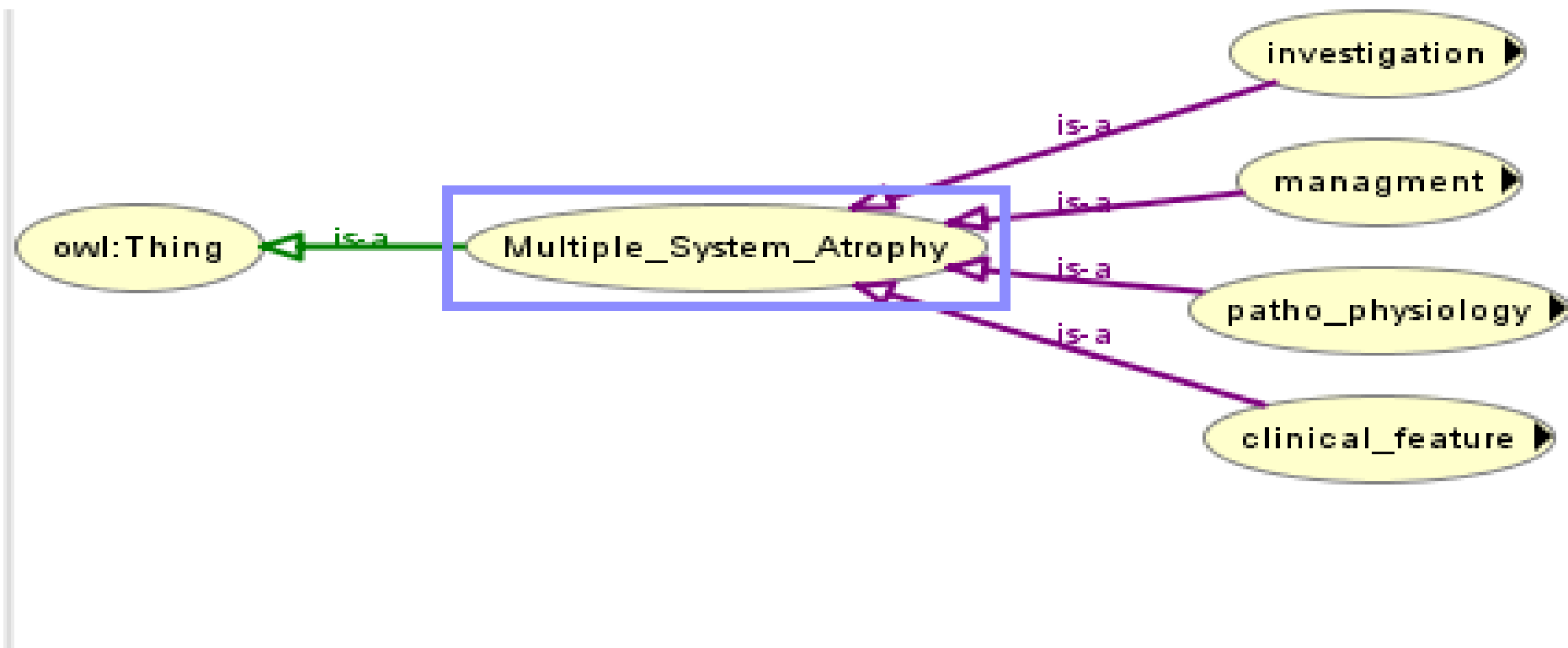


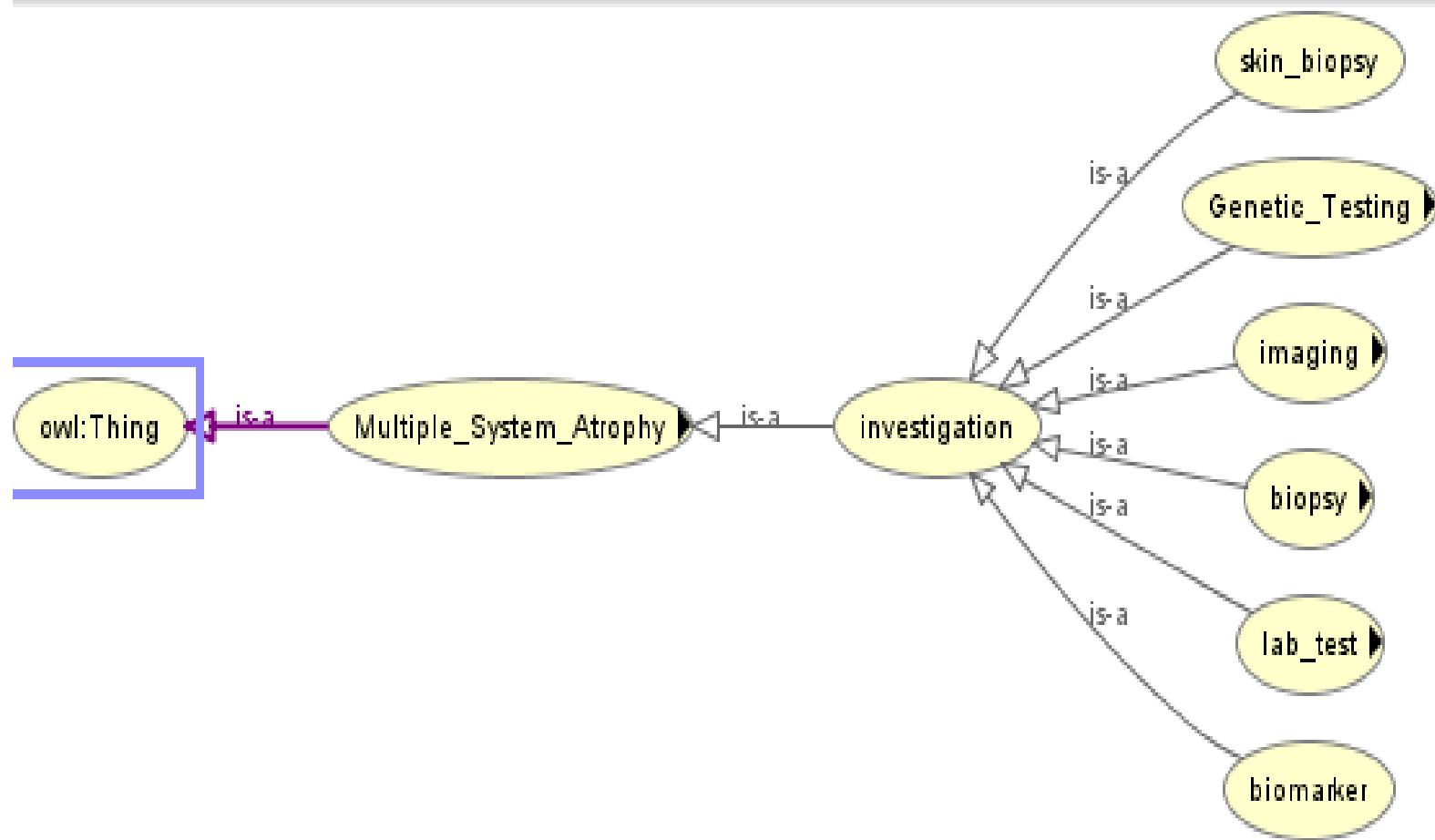
Algorithms

- Linear Regression.
- Logistic Regression.
- Decision Tree.
- SVM.
- Naive Bayes.
- kNN.
- K-Means.
- Random Forest.

ontology

- the Disease Ontology (DO) database (see Relevant Website section) is a knowledge base related to human diseases. The current version stores information about 8000 diseases. The aim of DO is to connect biological data (e.g. genes) considering a disease-centred point of view. The DO semantically integrates a disease and existing medical vocabularies.





Question?