

# Automating the Systematic Review Process: A Bibliometric Analysis



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Why is this important? Systematic reviews (SRs) require a lot of time and effort. The SR process can take over a year to complete. Automation can help speed up the process for researchers, students, and librarians through many stages of the review, including searching, deduplication, screening, bias assessment, and extraction.

## Why do this study?

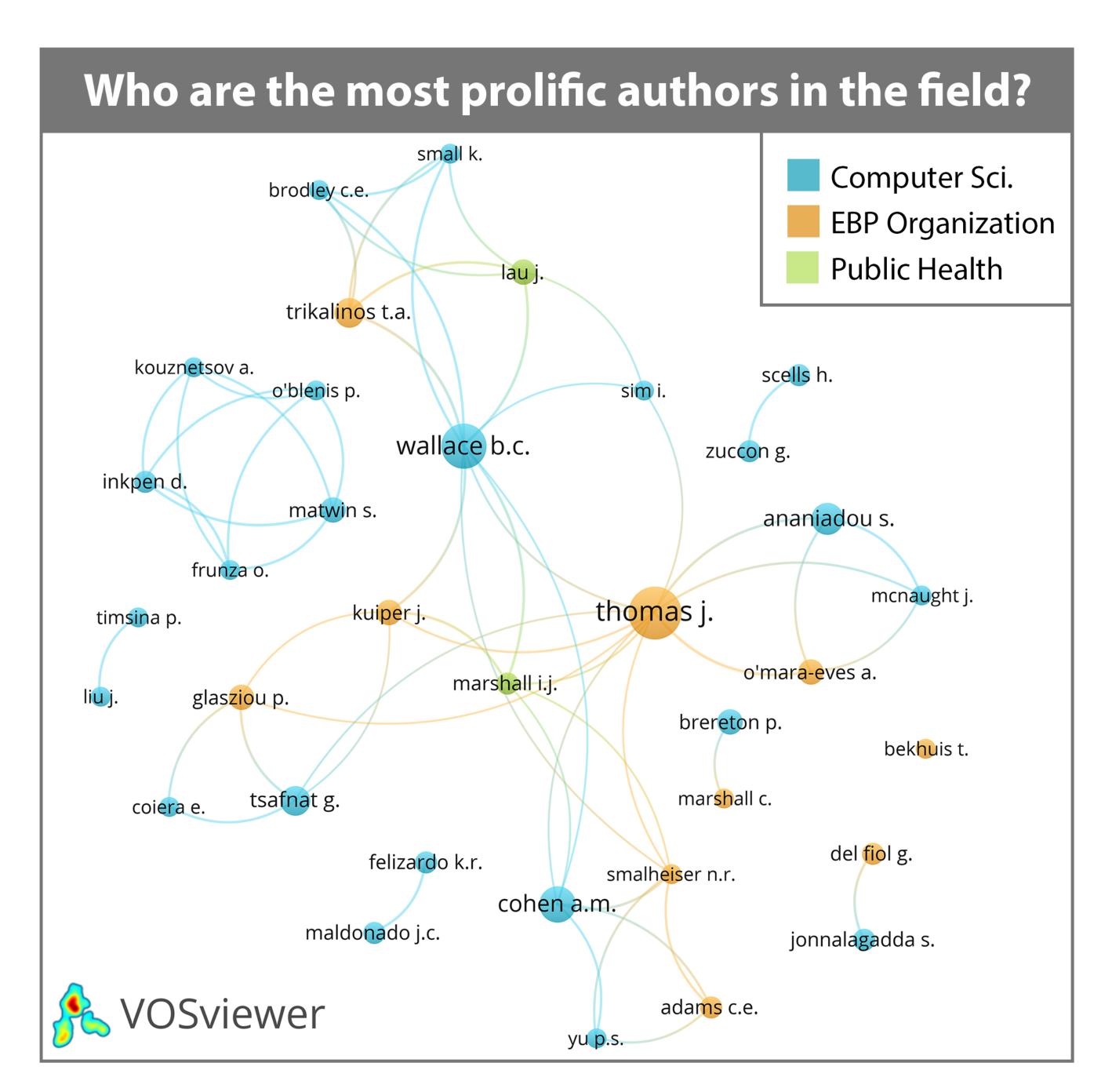
- To describe the state of the science in SR automation
- To identify popular SR automation tools
- To locate resources for learning about SR tools

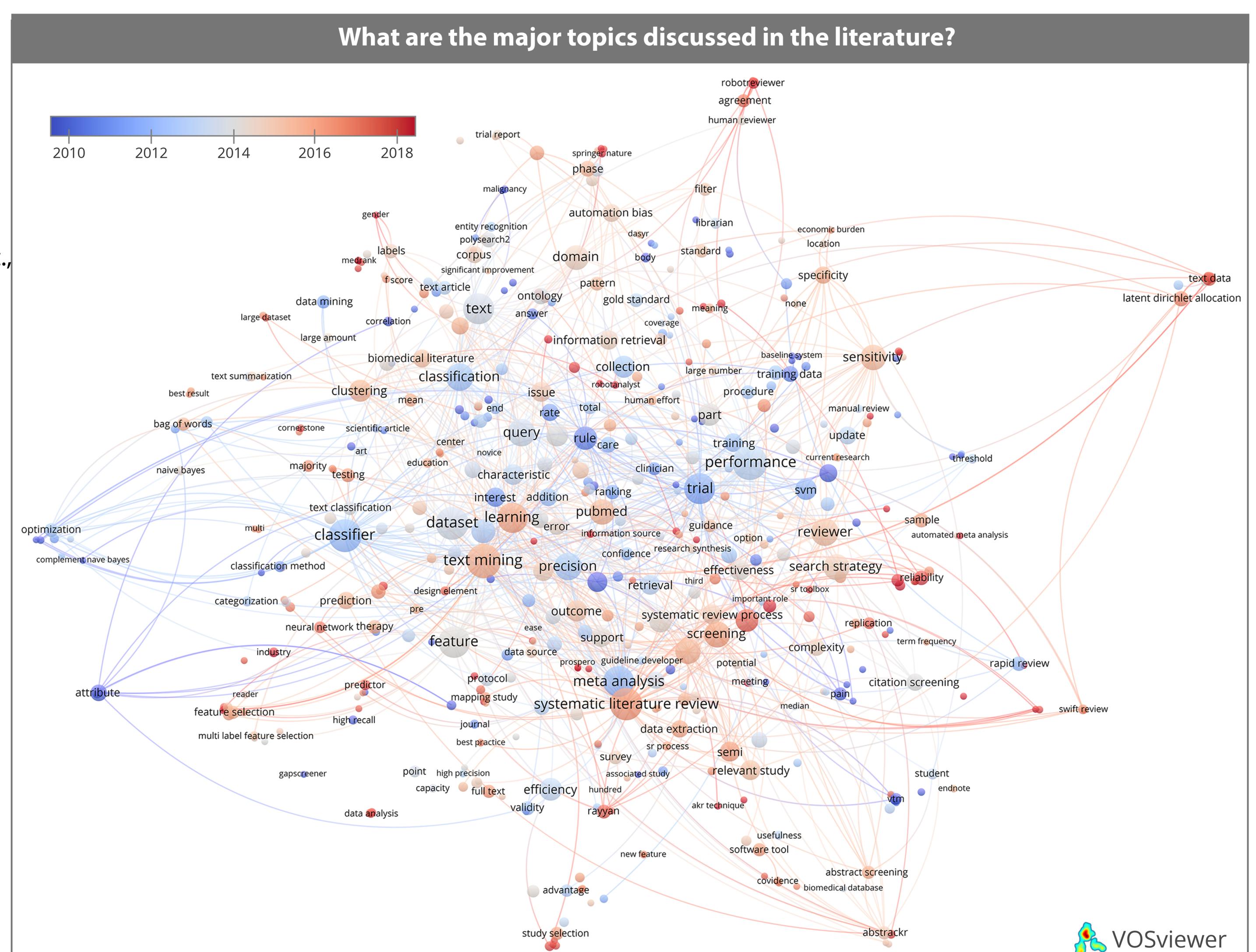
### What did we do?

- Search in Pubmed, Web of Science, Scopus, LISS, LISTA, LISA, & ACM for terms including machine learning, text mining, optimization, automation, etc., and systematic review or meta-analysis
- Deduplication of records and data cleaning
- Screening of a random sample of records to identify seed articles to use as training data
- Article prioritization with clustering tool
- Title/abstract and full text screening
- Aggregation of data
- Visualization with VOSviewer

## What are the top sources for new research?

- Systematic Reviews
- J Clinical Epidemiology
- J Biomedical Informatics
- ACM International Conference Proceedings Series
- AMIA Symposium Proceedings
- Research Synthesis Methods
- JAMIA
- Lecture Notes in Computer Science
- PLOS ONE
- BMC Bioinformatics





#### Results

- •The most prolific authors work in computer science or for evidence-based practice (EBP) organizations and are based in countries where EBP has been widely adopted. The majority of librarians have not yet adopted these tools.
- Over time, representation in publications has moved from conference proceedings or computer science journals to health sciences or systematic review journals.
- •The research focus has transitioned from theory to problem-solving, with development of bespoke tools to automate specific parts of the SR process. Prominent tools include DistillerSR, Rayyan, Abstrackr, RobotReviewer, and Swift Review, among others.

## Conclusions

- While adoption has increased in SR-focused publications and groups, more work must be done to gain acceptance in biomedical publications, including validation of algorithms and tools, guidelines for use in systematic reviews, and education for librarians and researchers.
- As key partners in performing systematic reviews and as educators in systematic review methods, librarians are poised to play an important role in the adoption and acceptance of this technology.

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