

”Computational Literature Reviews og Forskningskvalitet” - muligheder og udfordringer

- et fælles projekt sammen med
forskningsgruppe ved Institut for
Virksomhedsledelse



**DET KGL.
BIBLIOTEK**
Royal Danish Library

Lars Lund Thomsen og Gina Bay, AU Library
1. november 2023

En mail tikker ind i juli 2021:

Hej Gina

Ved du noget om computational literature review ?

Har du lyst til at være med ??

/Lars

Sent: 8. juli 2021 11:16

Subject: Computational Literature Reviews workshop

Hej Lars

I august afholder vores ... forskningsgruppe en workshop/et seminar om computational literature reviews (CLR).

Jeg (og mange af mine kolleger) husker tydeligt at du har/har haft stor interesse indenfor området og vi tænkte på

om du har lyst til at være en hjælpende hånd på projektet?

Vi kan godt bruge sparring i forhold til vores fremgang på workshoppen.

Udfordring:

*“The substantial volume, continued growth, and resulting complexity of the scientific literature available today not only **increases the need for systematic, replicable, and rigorous literature reviews**, but also makes it **increasingly resource-intensive** to conduct them. Given the natural limits of human researchers’ information-processing capabilities, extracting critical evidence, detecting subtle cues and recognizing latent patterns from large and complex scientific text corpora will, at best, become more costly and lengthy and, at worst, become **infeasible**.”*

Antons, D., Breidbach, C. F., Joshi, A. M., & Salge, T. O. (2023). Computational Literature Reviews: Method, Algorithms, and Roadmap. *Organizational Research Methods*, 26(1), 107-138. <https://doi.org/10.1177/1094428121991230>



Mulighed? Computational Literature Reviews

"We define the CLR method as:

*a structured process intended to **augment** human researchers' information processing capabilities through the **use of machine learning algorithms** that help **analyze** the content of a comprehensive text corpus in a specific knowledge domain..."*



Algoritmer ~ Objectivity eller black box?

*“the CLR method we put forth – especially when relying on unsupervised techniques [fx topic modelling]– enhances the **objectivity** of the CLR process by reducing the need to apply **predefined mental models** or **existing knowledge** structures on the corpus of interest. This **increases the reliability of reviews by reducing systematic biases***

[...]

*One important limitation, particularly for first-time users of CLRs, is the possible overreliance on standardized outputs generated by **the “black box” of underlying algorithms.**”*



Opstart:

Indledende fælles workshop i august 2021

- De enkelte forskere (9 i alt) præsenterer idéer til individuelle reviews
- Diskussion af mulighed for fælles paper om erfaringer med CLR
- Lars & Gina præsenterer værktøjer vi bruger i literature reviews

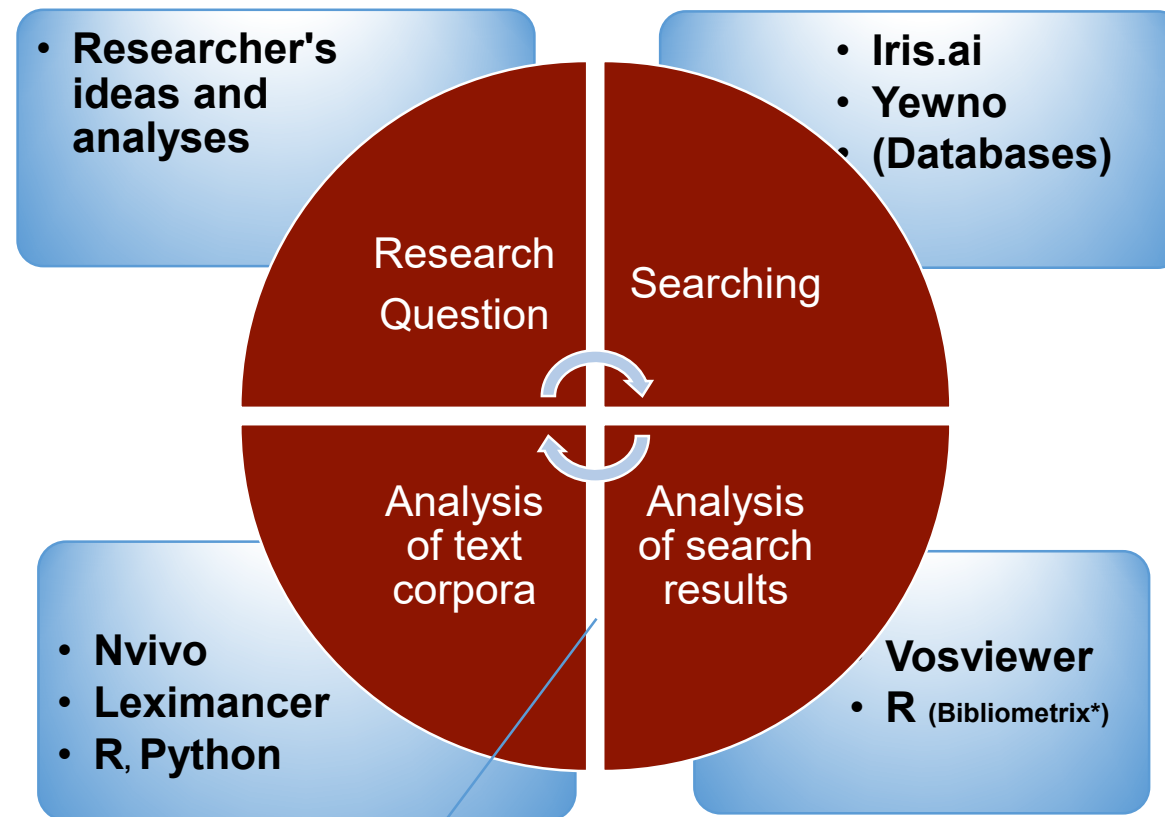
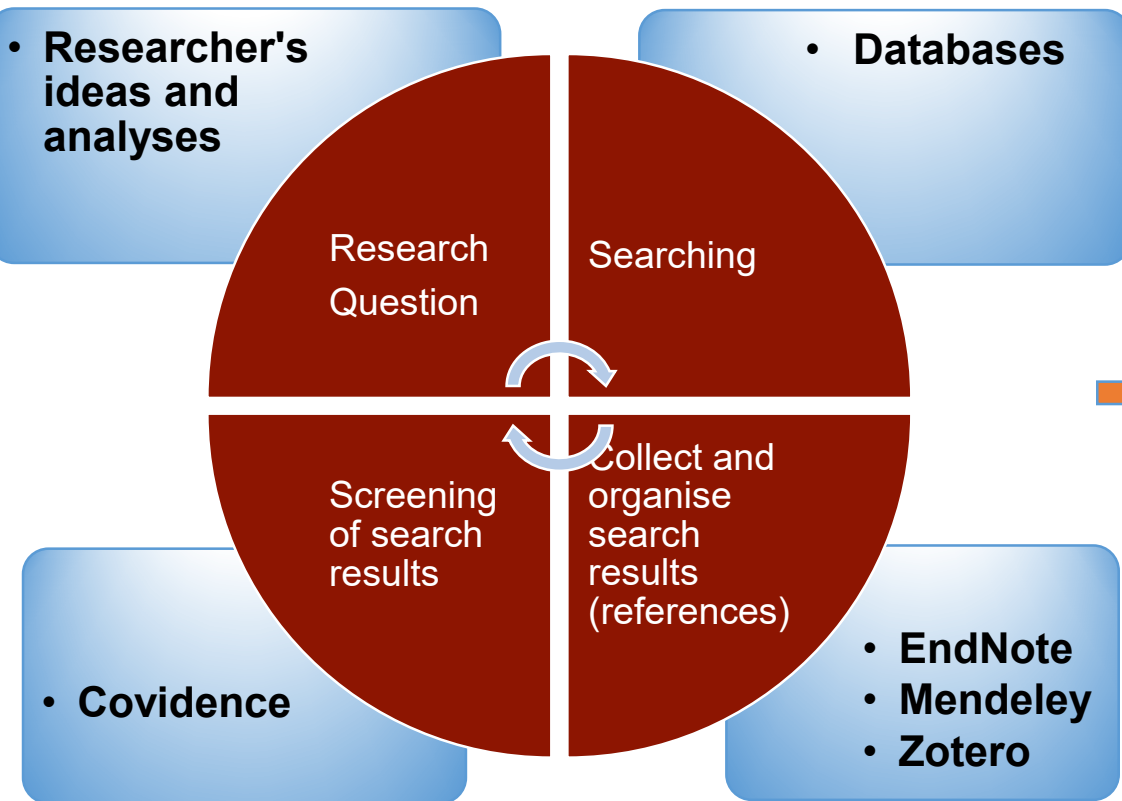
- Diskussionen om "tension" mellem black box – og det at kunne håndtere mængderne og *ikke* lave "kunstige" afgrænsninger i sin litteratursøgning fyldte meget(!) allerede fra starten



Hvad bruger vi "nu" (efteråret 2021)



AI augmented/ computer-aided



Screening tools:
DistillerSR
Rayyan
Abstrackr
ASReview



Efteråret 2021

- Efter 1. workshop vejledning på de enkelte forskeres reviews
- Jævnlig møder med gruppen
- Online-demo: DistillerSR (3 forskere + L&G)

*In conclusion: no one present would be really sad, if we did not chose DistillerSR, as there are too many limitations in the tool, and it takes too much time to get to know it – collaborate with ‘onboarding’ and **them setting up your ‘forms’ etc.***

- Deltage i Hackathon (Iris.ai og Yewno) arrangeret af KB’s AI projekt
(2 forskere + L&G)



Marts 2022

2 dages seminar i Sandbjerg

- Arbejde på fælles paper til konference i december
- Test-søgninger om brug af AI-tools i literature reviews i Scopus (L&G)
- Lege med søgeresultater i Vosviewer og Bibliometrix (L&G)



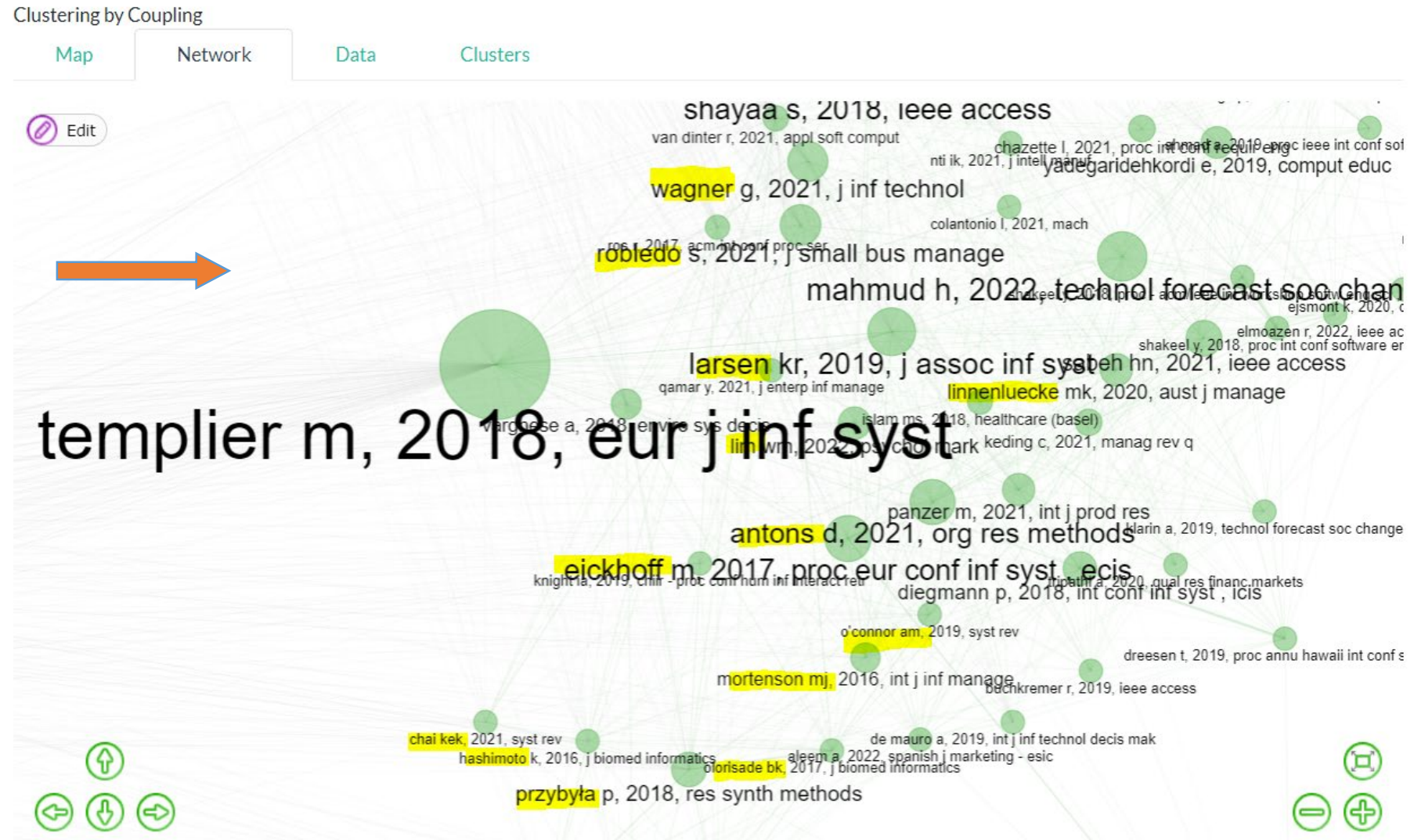
Dynamisk
arbejdsform:
skift mellem
individuel arbejde
og fællesmøder

	Tuesday	Wednesday
8-9		Breakfast
9-10	Drive from Aarhus	Individual work
10-11		
11-12	Check-in	Lunch
12-13	Lunch	
14-15	Meeting 1: kick start	Meeting 3: catching up
15-16	Work (in pairs)	Walk
16-17		Individual work
17-18		
18-19	Dinner	Dinner
19-20	Meeting 2: planning Wednesday	Social time and sleep
20-21		
21-	Social time and sleep	

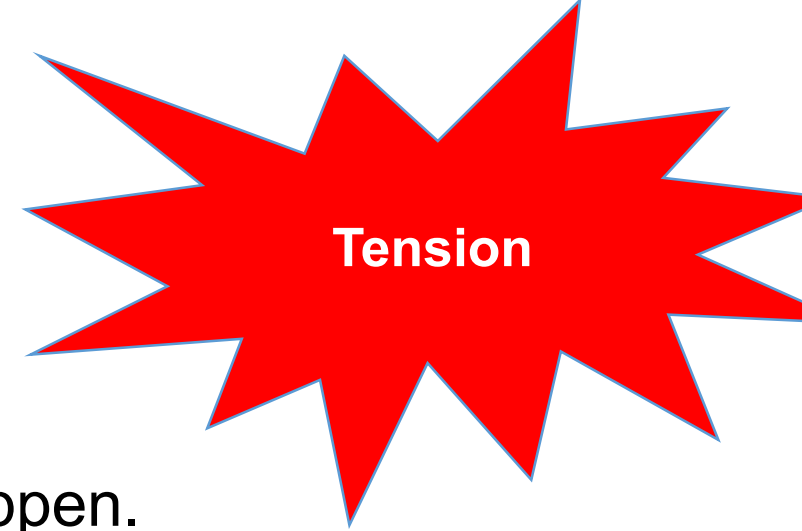


Forfatter-analysen i Bibliometrix (kan vi se nu) var ok – men ingen sammenhæng til Vosviewer ...

Nogle af de referencer vi nu identificerer som relevante, fandt **Bibliometrix** også i marts...



Diskussion om aftenen i Sandbjerg med forskergruppen om vores frustrationer



- Vi præsenterede vores frustrationer for forskningsgruppen.
- Vi blev ved med at vende tilbage til diskussionen om den “tension” vi så mellem AI Black box og transparency – og hvordan det påvirker forskningskvaliteten – hvad det så end er ??
- Det førte til at vi sammen med forskningsgruppen blev mere konkrete ift. hvad vi forstår ved forskningskvalitet – og så kom der en liste med begreber som: **validity; reliability; transparency; credibility; comprehensiveness; replicable; reproducible; trust**



Indledende observationer

- Antons-artiklen siger ikke noget om selve *review-processen*, primært analyse-delen → Sandbjerg, vi prøvede med nogle indledende testsøgninger
- ”Skuffet” over manglen på entydige resultater: Vosviewer og Bibliometrix giver forskellige udlægninger → det stritter i alle retninger
Gav megen lidt mening (måske) fordi det var en blanding af metoder, fag etc.
(bekræfter tidligere erfaringer med brede søgninger)
- Review søgning i april 2022 i Scopus
 - Ud fra diskussionen med forskerne om forskningskvalitet opbygger vi en søgestreng til et literature review om brug af AI-tools i literature reviews – og hvad det betyder for ”forskningskvalitet”



Søgestreng der skal undersøge AI tools i review proces – og sammenhæng til ‘forskningskvalitet’

(TITLE-ABS-KEY("computational literature review*" OR "AI based literature review*"))
OR
((TITLE-ABS-KEY("literature review*" OR "systematic review*")) **AND**
((TITLE-ABS-KEY(("topic model*" OR "text mining" OR "data mining" OR automati* OR
"machine learning" OR "artificial intelligence" OR ai))
AND TITLE-ABS-KEY((validity OR reliability OR transparen* OR credibility OR
comprehensiv* OR replicab* OR reproduc* OR trustworthiness))))))
AND (LIMIT-TO (PUBYEAR,2022) OR LIMIT-TO (PUBYEAR,2021) OR LIMIT-TO (PUBYEAR,2020) OR LIMIT-TO (PUBYEAR,2019) OR LIMIT-TO (PUBYEAR,2018) OR LIMIT-TO (PUBYEAR,2017) OR LIMIT-TO (PUBYEAR,2016) OR LIMIT-TO (PUBYEAR,2015) OR LIMIT-TO (PUBYEAR,2014)) → **2419 resultater i Scopus, 6.4.22**



Erfaringer fra screening af søgeresultatet:



- Vi bestræbte os på at være åbne – for at kunne ”mappe” hvilke tools der bliver brugt hvor i processen
- Udfordring1: Vi kunne ikke se om AI var anvendt på fagområdet eller review-processen → Vi brugte lang tid på ti,ab screening (april-juni 2022)
- Udfordring2: AI på review-processen ikke nødvendigvis nævnt i ti,ab - så vi kan være gået glip af en del i første omgang screening.
 - **Startede med 2419 → ti, ab screening: 512 → fuldtekstscreening: 376 relevante**
- Forsker1: ”*AI black box er problematisk*”,
- L&G: vores erfaring at som mennesker er der også en black box ... Vi er *ikke* stabile screenerne! Vi lærer undervejs i processen.
- Forsker2: ”*Screen det hele – og så screener du igen ...*”)



Human reviewers1

Lars: “how do we translate all the human subtleties involved in a review to a transparent and reproducible model/method fitted for AI ML??”

- *“human researchers can be prone to errors caused by overapplying prior experience, past mental models, or knowledge structures. This is why, when used in conjunction with human insights, algorithms can enhance the rigor of CLR s compared to MLR approaches”* (Antons et al 2021/2023)
- *“When considering potential AI-support of this step [ti,ab screening], the reliability of manual screening processes should not be overestimated”* (Wagner et al 2021)



Human reviewers2

- *“Human reviewers have been used as the “gold standard” in evaluating the automation tools. However, similar to those “gold standards” used in clinical medicine, 100% accuracy is unlikely in reality. We found **10.76% error rate made by human reviewers in abstract screening ...**”* (Wang et al 2020)
- *“Errors may occur at random (due to fatigue or distraction) or, more consequentially, systematic human biases or errors”* (Bannach et al 2019)
- *Og hvad med studentermedhjælpere som screenere?
– der evt. skiftes ud undervejs ??*



Jeres erfaringer: diskuter 2 og 2

Med afsæt i jeres egne erfaringer: hvilke udfordringer og muligheder oplever I ift. literature reviews specielt med fokus på:

- Transparens
- Reproducerbarhed
- Validitet

gerne i forhold til brug af AI tools (eller computer-aided tools)



Mapping på basis 376 inkluderede artikler

We identified 4 categories

1. Tools used in lit review process + 'quality' discussion
173 ud af 376

2. Tools used in lit review process % 'quality' discussion
132 ud af 376

1. Our main focus; 2. Relevant to get an overview of tools; 3.+ 4. may be excluded in the end

3. 'Quality' discussion in lit review process % tools
31 ud af 376

4. Tools & methods that might be relevant to our project but not necessarily used in lit review process
40 ud af 376



Proces, databøvl, frem og tilbage og så analyse

Proces	Kilde	Dataframe	Analyser	Værktøjer	Erfaringer
2419 screened against title and abstract	Scopus	Fuld	Bibliometri Textmining	Vosviewer Bibliometrix Orange	☹ Ingen entydige resultater
512 screened for full- text	Covidence	CSV, RIS	Textmining	Python Chatgpt	
376 studies included					
356 with doi	Scopus	Fuld	Bibliometri Textmining	Vosviewer	☺ Entydige resultater



Chatgpt: hjælp til Python



I have a long list of doi numbers and want to create a search string looking like this DOI (10.1108/lhtn-03-2023-0043) OR DOI (10.3390/su151511524) OR
Could you please give me the python code that can generate this search sting



Sure, you can generate a search string from a list of DOI numbers in Python using a loop or list comprehension. Here's a Python code snippet that does that:

python

Copy code

```
# List of DOI numbers
doi_list = [
    "10.1108/lhtn-03-2023-0043",
    "10.3390/su151511524",
    # Add more DOI numbers here
]

# Generate the search string
search_string = " OR ".join([f"DOI ({doi})" for doi in doi_list])

# Print the search string
print(search_string)
```

This code defines a list of DOI numbers (`doi_list`) and then uses a list comprehension to create a formatted string for each DOI number in the list. Finally, it joins these strings with " OR " to create the desired search string. You can add more DOI numbers to the `doi_list` as needed.

Scopus analysis – year

20 dokumenter (konferancepapers)
som ikke har doi

356 document results

Select year range to analyze: 2014



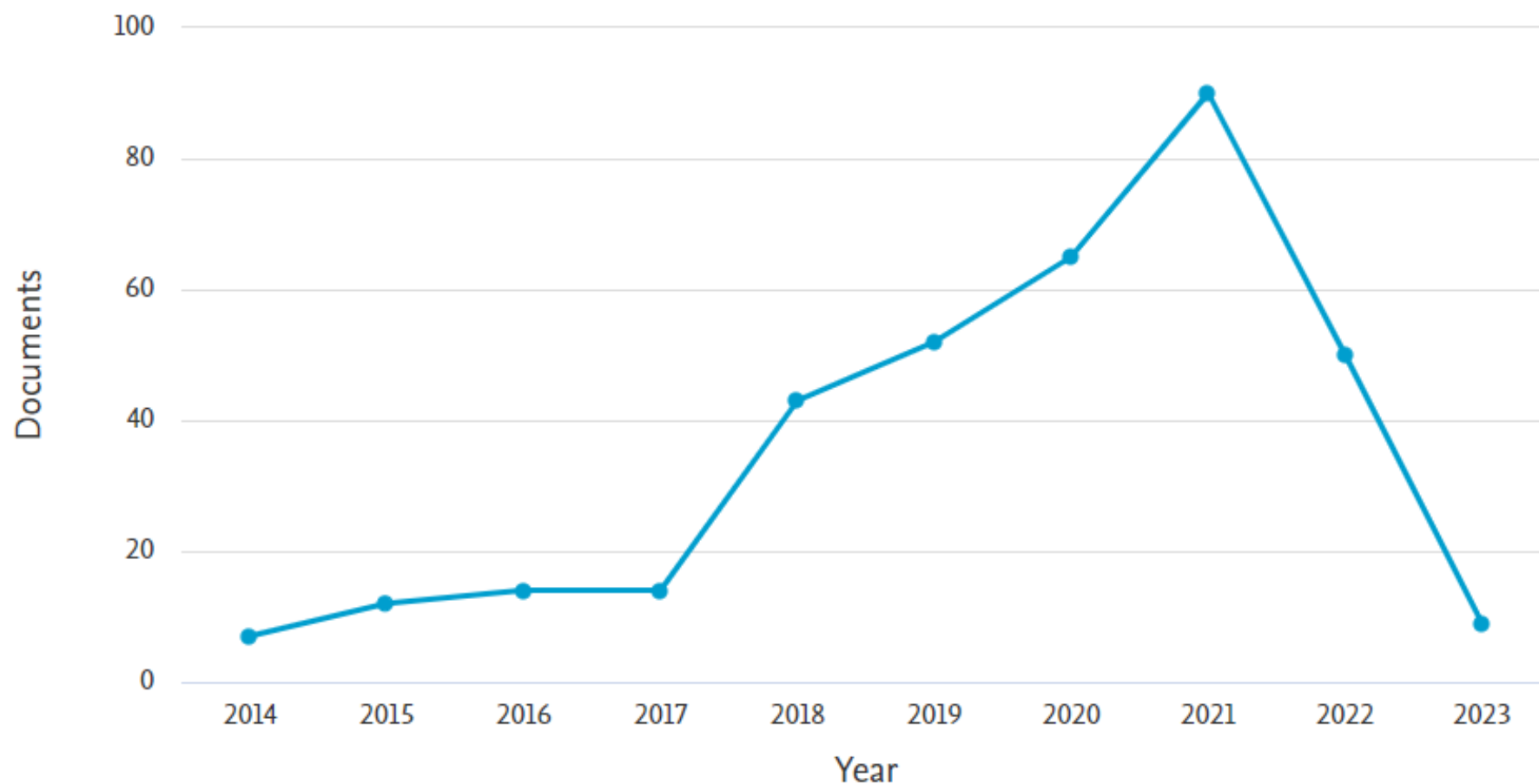
to

2023



Analyze

Documents by year



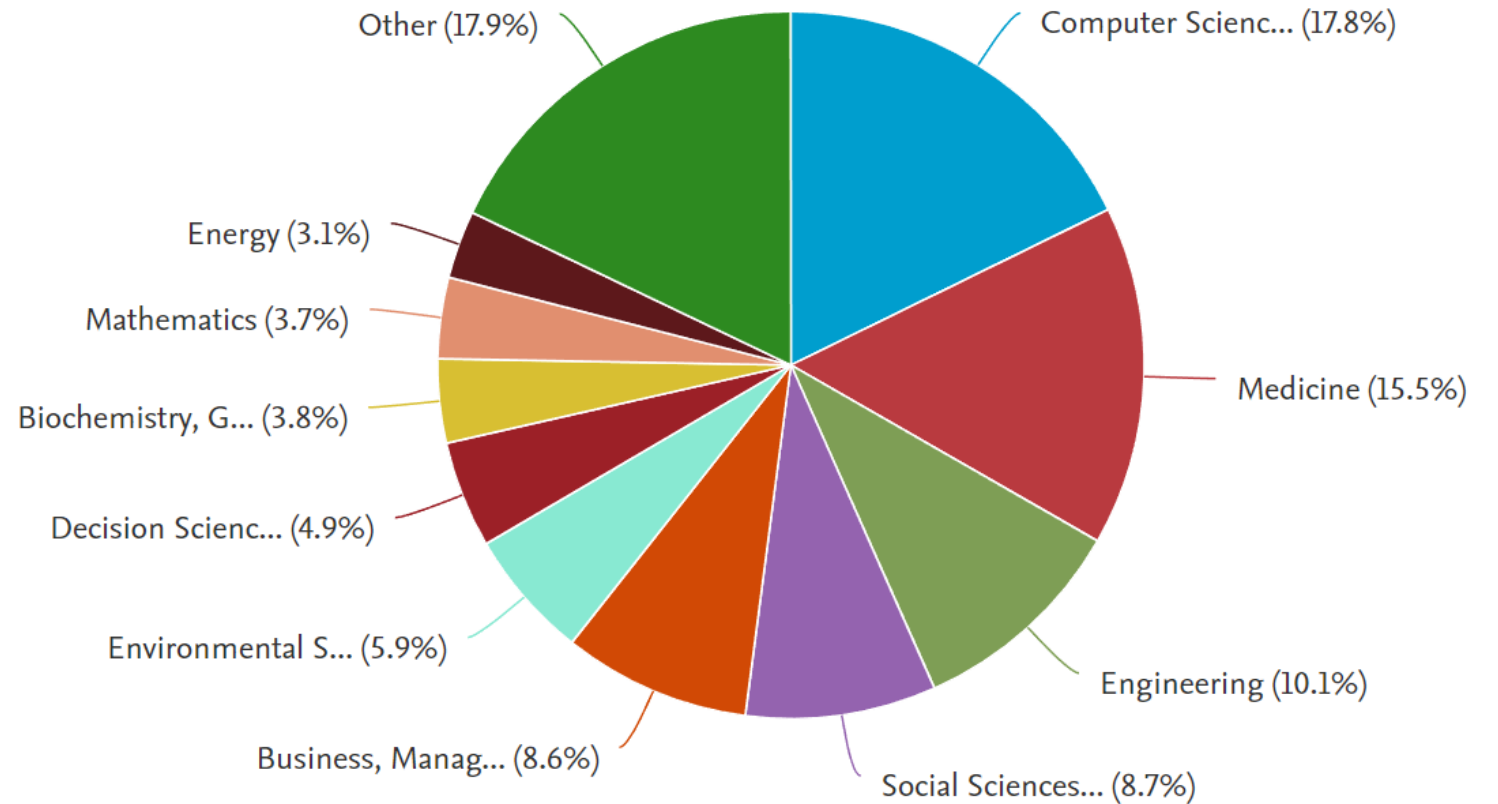


Subject area ↓

Documents ↓

Subject area	Documents
Computer Science	120
Medicine	105
Engineering	68
Social Sciences	59
Business, Management and Accounting	58
Environmental Science	40
Decision Sciences	33
Biochemistry, Genetics and Molecular Biology	26
Mathematics	25

Documents by subject area



Journals

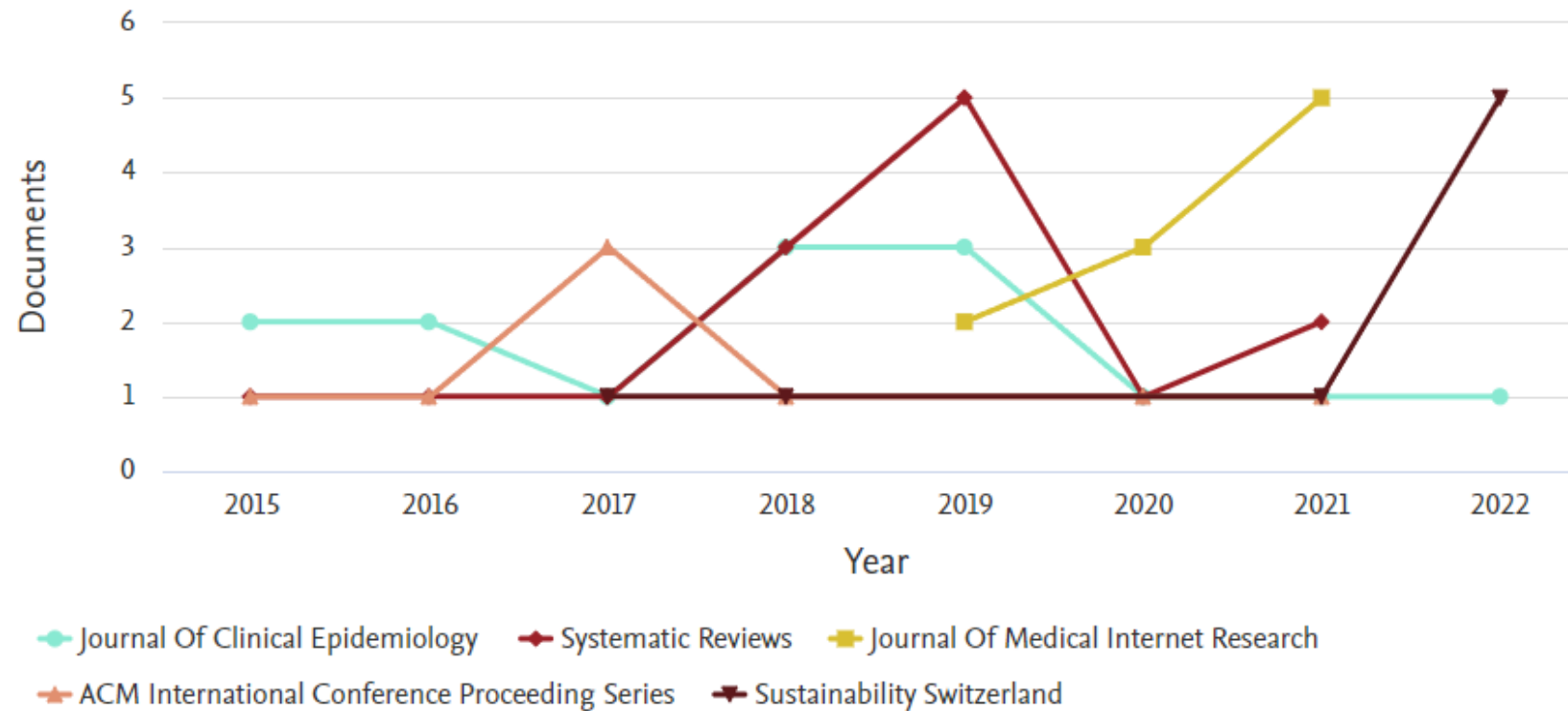
Source ↓ Documents ↑

<input checked="" type="checkbox"/> Journal Of Clinical Epidemiology	14
<input checked="" type="checkbox"/> Systematic Reviews	14
<input checked="" type="checkbox"/> Journal Of Medical Internet Research	10
<input checked="" type="checkbox"/> ACM International Conference Proceeding Series	8
<input checked="" type="checkbox"/> Sustainability Switzerland	8
<input type="checkbox"/> IEEE Access	7
<input type="checkbox"/> Journal Of Biomedical Informatics	6
<input type="checkbox"/> Plos One	6
<input type="checkbox"/> Research Synthesis Methods	6

Documents per year by source

Compare the document counts for up to 10 sources.

[Compare sources and view CiteScore, SJR, and SNIP data](#)



Snip af tabel med foreløbig manuel analyse

Hvor i reviewproces	Tools	Metode	Outcome	Kvalitetsdiskussion	Challenges
Analyse	Leximancer, R, Python, LWIC, Coh-Metrix	Text mining (supervised, unsupervised(fx LDA), dictionary based)	Six-step roadmap of the CLR method: from initially identifying the review objectives to be pursued, to selecting appropriate algorithm, and reporting the findings. Identifying critical design decisions and challenges for each step, and by providing practical guidelines,	validity; reproducibility; transparency; comprehensiveness; replicable; impactful; systematic, rigorous; increased scale and scope; scalable; real-time capable; timely; efficient; augmenting human information processing and analytical capabilities; control; CLR user need to validate and	Messiness (iterative cycles of goal specification) n overreliance on black box of un algorithms
Hele processen: Step-by-step. Fokus: AI based tools to reduce time-consuming and repetitive tasks apropos Brannach 2019 og Strümke 2023	Flere, udvalgt ift de forskellige steps	Flere	Overblik? Potential for AI support in each step	validity; reproducibility; transparency; reliability; comprehensive; replicability; rigor; bias; interoperability; inspectability; extensibility; scalability;	“transparency to remain a pe constraint on A

Kvalitets-diskussionen? “Fund” fra litteraturen:

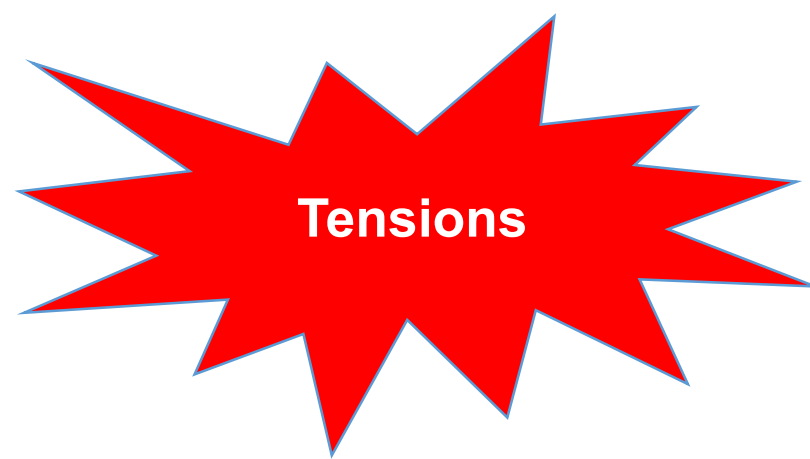
- **Augmenting human information processing and analytical capabilities**
- **Efficient**
- **Timely**
- **Ability to reveal previously undetected patterns or connections.**
(“CLR users need to validate and supplement algorithmic output”
(Antons et al 2021/23, fokus: text mining i analyse-delen)



Kvalitets-diskussionen? “Fund” fra litteraturen:

- **More resistant to bias; deeper (more accurate and detailed results and allows not only the **discovery of trends** but also an observation of their **dynamics**.**
(Wawak et al 2020, fokus: topic modelling i analyse-fasen)
- **More accurate and *updated* results**
(Asmussen & Møller 2019, fokus: topic modelling i analyse-fasen)
- **Scalability, Interoperability, inspectability, extensibility**
(Wagner et al 2022, fokus for artiklen er hele processen, men her ift 1) analyse og 2) screening)





AI

- Maskinkraft
- Skalerbart
- Opdage “latente” mønstre
- Opdatering

udfordringer

- Black box
- Transparens
- Objektiv/subjektiv
- Verificering

human

- “Kunstige” afgrænsninger
- Kreativitet
- “Review fatigue”



Udfordringer? Ophavsret – hvad må vi?

github.com/clausba/Smart-Literature-Review/blob/master/Topic%20modeling%20R-Code.Rmd

Files

master

Go to file

- Cross Validation Result.xlsx
- Output.html
- Topic modeling R-Code.Rmd

Smart-Literature-Review / Topic modeling R-Code.Rmd

Code Blame 241 lines (194 loc) · 7.78 KB

Raw Copy Download Open in IDE

```
22
23 #Get and load PDF's
24 ```{r}
25 files <- list.files(path = "C:\\Usi
26
27 Rpdf <- readPDF(control = list(text = "-layout"))
28
29 setwd("C:\\Usi
30 ###Remember to
31 documents <- lapply(files, pdf_text) #>% read_lines()
32
33 corp <- Corpus(VectorSource(documents))
34
35 ##Clean text
36 corp <-tm_map(corp,content_transformer(tolower))
37
38 #remove punctuation
39 corp <- tm_map(corp, removePunctuation)
40 #Strip digits
41 corp <- tm_map(corp, removeNumbers)
42 #remove stopwords
43 corp <- tm_map(corp, removeWords, stopwords("english"))
44 #remove whitespace
45 corp <- tm_map(corp, stripWhitespace)
46 #Remove URL
47 urlPat<-function(x) gsub("(ftp|http)(s?)://.*\\b", "", x)
48 corp<-tm_map(corp, urlPat)
49 #Remove Email
50 emlPat<-function(x) gsub("\\b[A-Z a-z 0-9._ - ]*@[.]*[.]{1,3} \\b", "", x)
51 corp<- tm_map(corp, emlPat)
52
53 #Stem document
54 corp <- tm_map(corp,stemDocument)
55
56 #Remove stopwords
57 myStopwords <- c("can", "say","one","way","use",
58 "also" "howev" "tell" "will"
```

Asmussen & Møllers
Topic modeling R-code tilgængelig i github
<https://github.com/clausba/Smart-Literature-Review>

November 2023

Udfordringer? Ophavsret – hvad må vi?

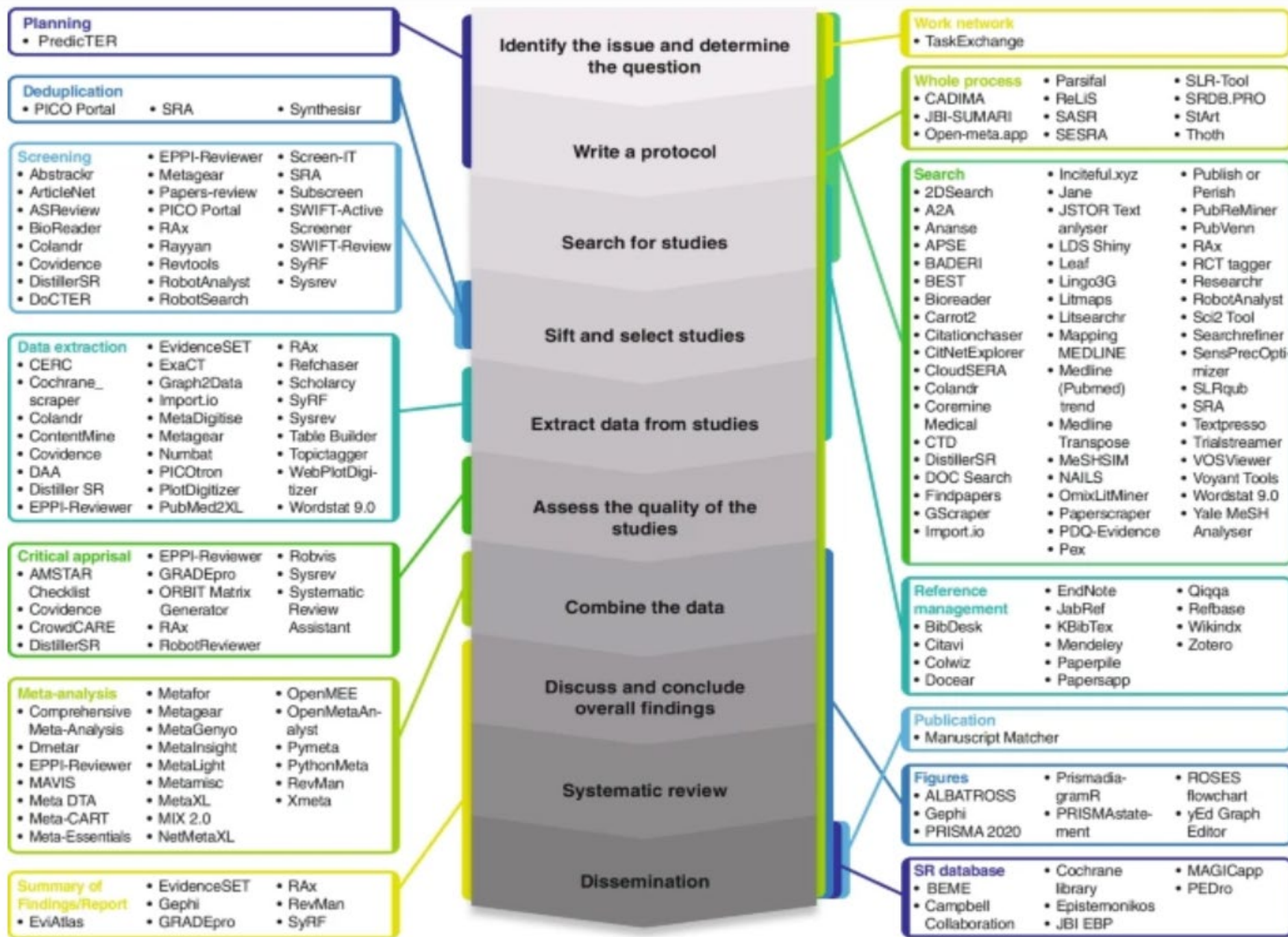
Outcome	Replication	Replicate	reproducible	transparent
<p>What is the purpose of the study?</p> <p>The purpose of the study is to provide a comparison between the results of ML/AI driven literature review tools and those of a study conducted by humans, and to provide insights into the usefulness and trade offs of available AI and ML tools for literature reviewing. The study also aims to demonstrate the power and limits of ML to replicate and expand upon human efforts, and to show that ML can reinforce human findings to support replicability and robustness</p>	<p>The text mentions replication, stating that "scrutiny of replication and rigor [in entrepreneurship and small business management scholarship] is becoming increasingly prevalent" and that "the replication crisis in general management research is far reaching." However, it does not provide a specific answer to a question about replication</p>	<p>The text answers the question. The authors investigate how scholars in entrepreneurship and small business management can capitalize on AI and ML to support their scholarship and comprehensively review, catalog, and analyze the literature</p>	<p>The text mentions replicability of human findings through the use of ML</p>	<p>The text mentions that ML can add additional layers of transparency and validity to conclusions from human derived systematic reviews</p>
<p>What was the outcome of the case?</p> <p>The outcome of the case was an overview of the research areas within the paper corpus, represented by the 20 topics and the 10 sub topics. The framework successfully placed the selected papers into groups of papers that resemble each other, and the grouping and selection of papers in the literature review, based on the framework, did make semantic sense and was successfully used for a literature review. The framework has proven its utility in enabling a faster and more comprehensive exploratory literature review, as compared to competing methods</p>	<p>What method was used to calculate perplexity?</p> <p>The method used to calculate perplexity was the perplexity method in the 'topicmodels' R library</p>	<p>What is the aim of the paper?</p> <p>The aim of the paper is to enable the use of topic modelling for researchers by presenting a step by step framework on a case and sharing a code template</p>	<p>The framework enables huge amounts of papers to be reviewed in a transparent, reliable, faster, and reproducible way</p>	<p>The framework enables huge amounts of papers to be reviewed in a transparent, reliable, faster, and reproducible way</p>

Data extraction i Elicit?
 Test: upload af 7 pdf'er – 15 kolonner

Erfaringer fra projektet

- Vi har et godt udgangspunkt i vores datasæt – der skal arbejdes videre
- Vigtigt for forskergruppen at bevare (en vis) kontrol over redskab, metode og data – derfor fx DistillerSR blev valgt fra
- Opnået viden og erfaringer er et godt grundlag for at kunne forholde sig til de mange AI tools der pibler frem nu – lever de op til kriterier som: transparency, validity, reproducibility og ”kontrol”/customisability (brugt i konkrete oplæg for AU-forskere)
- Henvendelse fra forsker om screenings-værktøjet ASReview og stopkriterier. Ud fra litteraturen kunne vi sende en håndfuld artikler
- Lars’ python opskrift er brugt ift. forskers arbejde





Vi er overhalet indenom

Cierco Jimenez, R., Lee, T., Rosillo, N., Cordova, R., Cree, I. A., Gonzalez, A., & Indave Ruiz, B. I. (2022). **Machine learning computational tools** to assist the performance of systematic reviews: A mapping review. *BMC medical research methodology*, 22(1), 322.

<https://doi.org/10.1186/s12874-022-01805-4>

Eksempel på ny artikel fra screening i ASReview. Og der er sikkert sket meget siden da ...

(det er de sikkert også ... 😊)

Plan 2023-2024

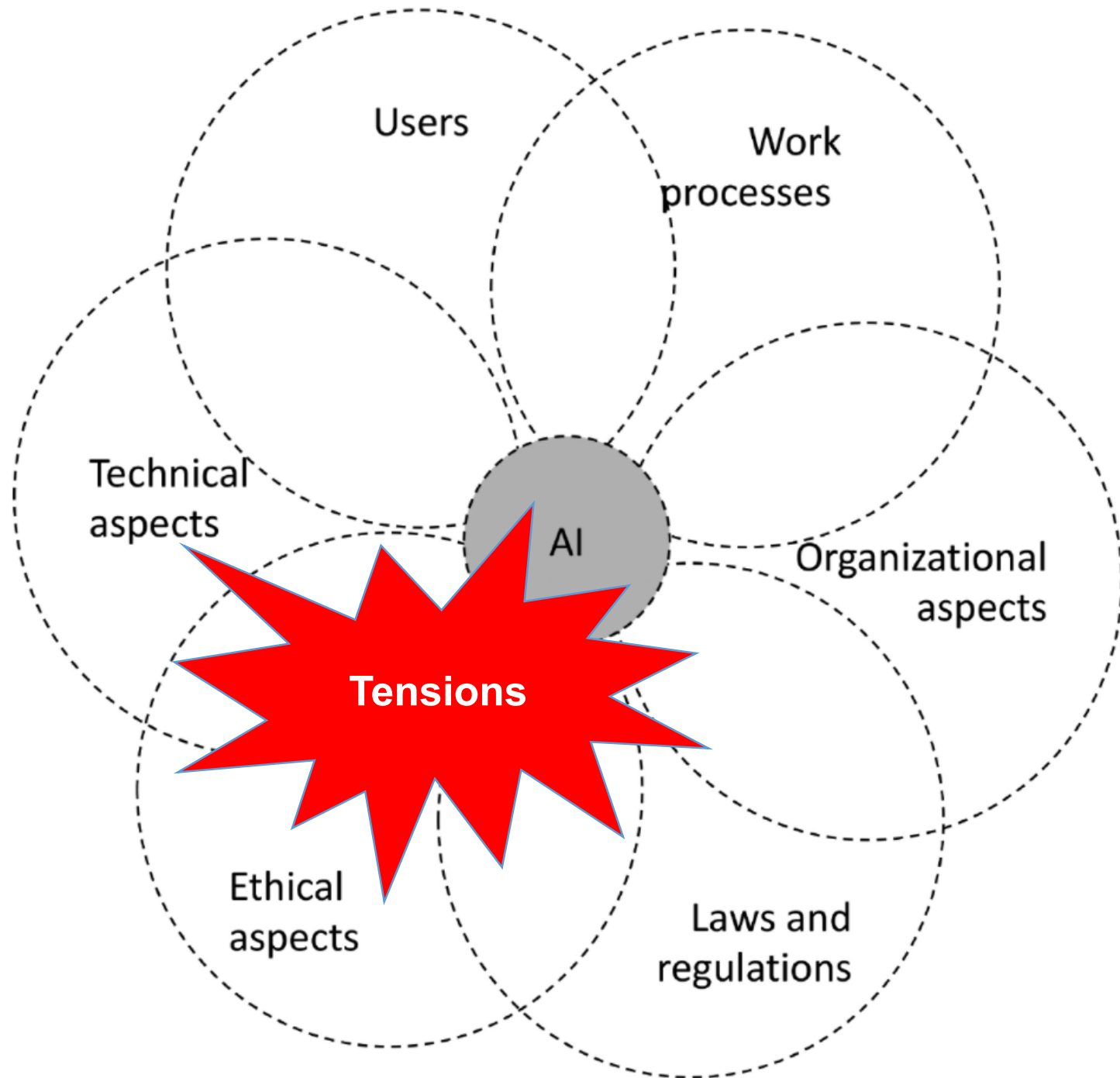
- Arbejde videre med resultater
 - Yderligere analyse, flere og bedre kompetencer, undersøge om findes der retningslinjer
- Mødes med forsker-gruppen: diskussion og verificering
- Modeller for analyse som kan anvendes på andre (bedre) data (effektivisering inkl. reproducerbarhed)
- Opbygge flere kompetencer ift. værktøjer og analyse



Diskussion

- Kan vi retfærdiggøre det **store tidsforbrug**, når det går så stærkt?
→ Det at det går stærkt gør det **ikke** mindre vigtigt at vi er obs på kvalitetsdiskussionen!
- Fx efterlyser forskere retningslinjer for hvordan man *dokumenterer* sit arbejde med AI baserede/computer-aided redskaber (transparens & reproducerbarhed) (erfaring fra oplæg for undervisere fra AU Psykologisk Institut om AI baserede værktøjer til litteratursøgning)
- Stor andel af artiklerne der ikke beskriver egen AI baseret/computer-aided metode – eller ikke forholder sig til egen metode – hvad kan det være udtryk for?
- Store forandringer på instituttet – svært at holde fast i forskergruppen





Informationsspecialisten:

Får vi en ny rolle?

Broker?

Gatekeeper?

Hvordan kommer vores kompetencer i spil?

Waardenburg, L. et al. (2021)
Managing AI Wisely: From Development to Organizational Change in Practice.

Appendix – Tests af AI baserede tools

➤ **Discovery**

- Litmaps
- ScopusAI
- Citationchaser
- Semantic Scholar

➤ **Screening**

- ASReview

➤ **Analyse**

- Elicit



Litmaps

Unsaved Search Save

4 Articles

Add/Remove from Collections

- New Collection
- 9 udvalgte 1ere 14 articles ✓
- repositories 21 articles + -
- CLR 4.5.23 15 articles + -

artificial intelligence on different types of A comparative study

os aplicado al análisis del papel del aprendizaje siones sistemáticas

... 2022 – Revista de Investigación, Desarrollo e Innova...

48 0

AI-Based Literature Reviews: A Topic Modeling Approach

● Verma, 2023 – SRELS Journal of Information Management

19 0

Contextualizing the rural in digital studies: A computational literature review of rural-digital relations

● Zhang, 2023 – Technology in Society

45 0

- Support
- What's New
- Documentation

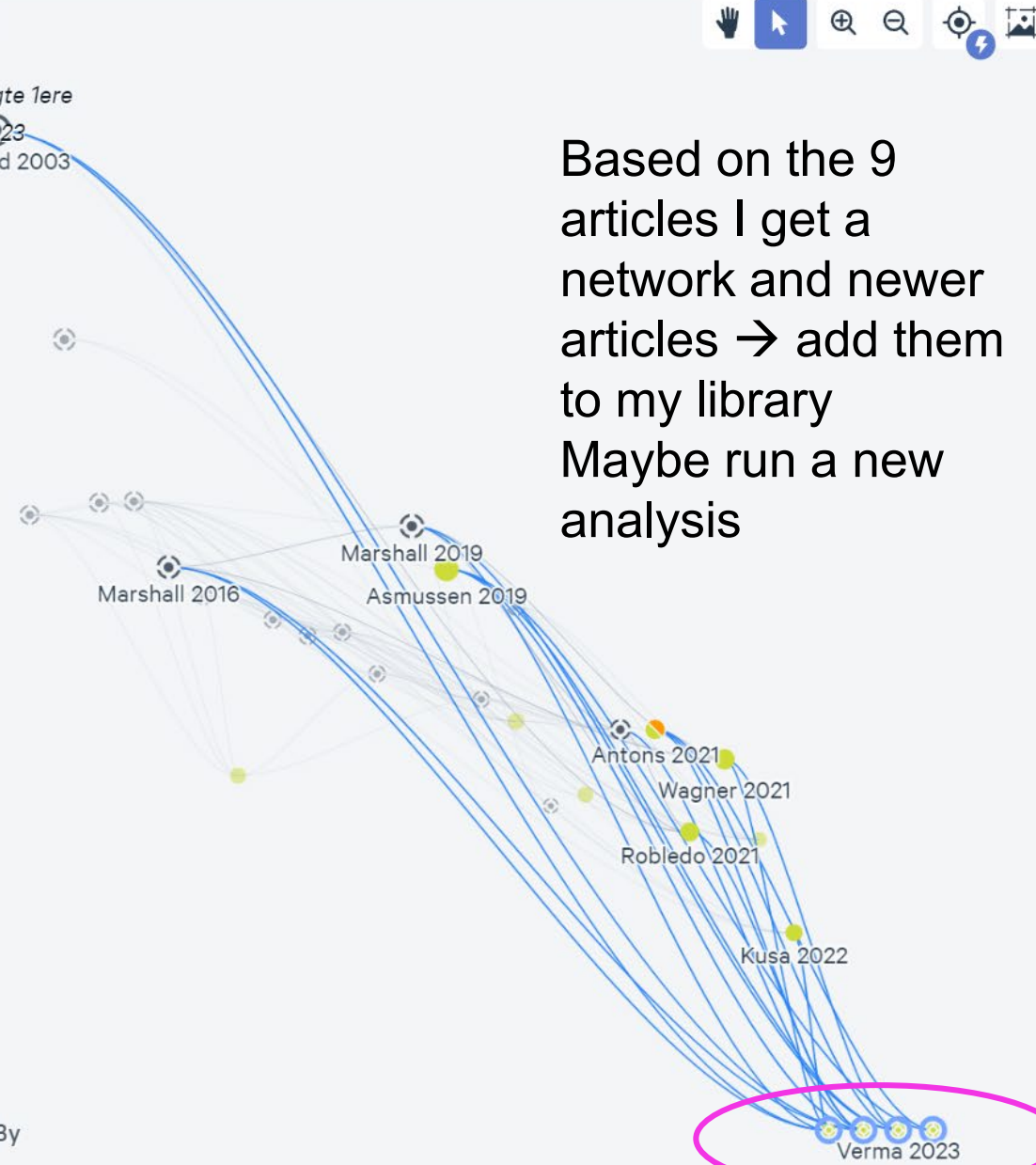
giba@kb.dk GI

Default Workspace

Results

Inputs

- 9 udvalgte 1ere
- CLR 4.5.23 Tranfield 2003



Based on the 9 articles I get a network and newer articles → add them to my library Maybe run a new analysis

- Cited By
- Cited By

↳ what are the biggest strengths and challenges when using computational literature review methods

Computational literature review methods have several strengths and challenges, as highlighted in the abstracts. Here are the key points:

Strengths:

1. **Efficiency and scalability:** Computational techniques support researchers in synthesizing large volumes of literature, addressing the natural limits of human information processing capabilities . [1](#)
2. **Systematic and replicable:** Computational literature reviews (CLRs) provide a systematic and replicable approach to literature review, ensuring rigor and reliability . [1](#)
3. **Guidance and practical guidelines:** A six-step roadmap and practical guidelines have been proposed to design, conduct, and document CLRs, making the method accessible to novice and expert users . [1](#)

Challenges:

1. **Lack of methodological guidance:** Despite the benefits, there is a lack of actionable methodological guidance for designing and conducting CLRs . [1](#)
2. **Unorganized growth in literature:** The increasing volume of literature may hinder literature review efforts by introducing complicated, competing, and implausible arguments . [2](#)
3. **Quality and limitations of AI tools:** The use of artificial intelligence (AI) tools, such as ChatGPT, in literature reviews has potential, but there are drawbacks and limitations that need to be considered . [3](#)

In conclusion, computational literature review methods offer efficiency, scalability, and systematic approaches, but challenges include the lack of methodological guidance and the limitations of AI tools.



Scopus AI **Beta**

Reference [1](#) • 27 citations

Computational Literature Reviews: Methods, Algorithms, and Roadmap [↗](#)

Antons, D. [↗](#), Breidbach, C.F. [↗](#), Joshi, A.M. [↗](#), Salgado, J. [↗](#)
Organizational Research Methods [↗](#) 2023

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Reference [2](#) • 3 citations

Towards Nuts and Bolts of Conducting Literature Review: A Typology of Literature Review [↗](#)

Taherdoost, H. [↗](#)
Electronics (Switzerland) [↗](#) 2023

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Reference [3](#) • 0 citations

Using LLM (Large Language Model) to Improve Efficiency in Literature Review for Undergraduate Research [↗](#)

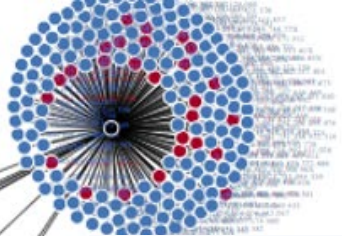
Antu, S.A. [↗](#), Chen, H. [↗](#), Richards, C.K. [↗](#)
CEUR Workshop Proceedings [↗](#) 2023

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Citationchaser



Smart literature review: a practical topic modelling approach to literature review

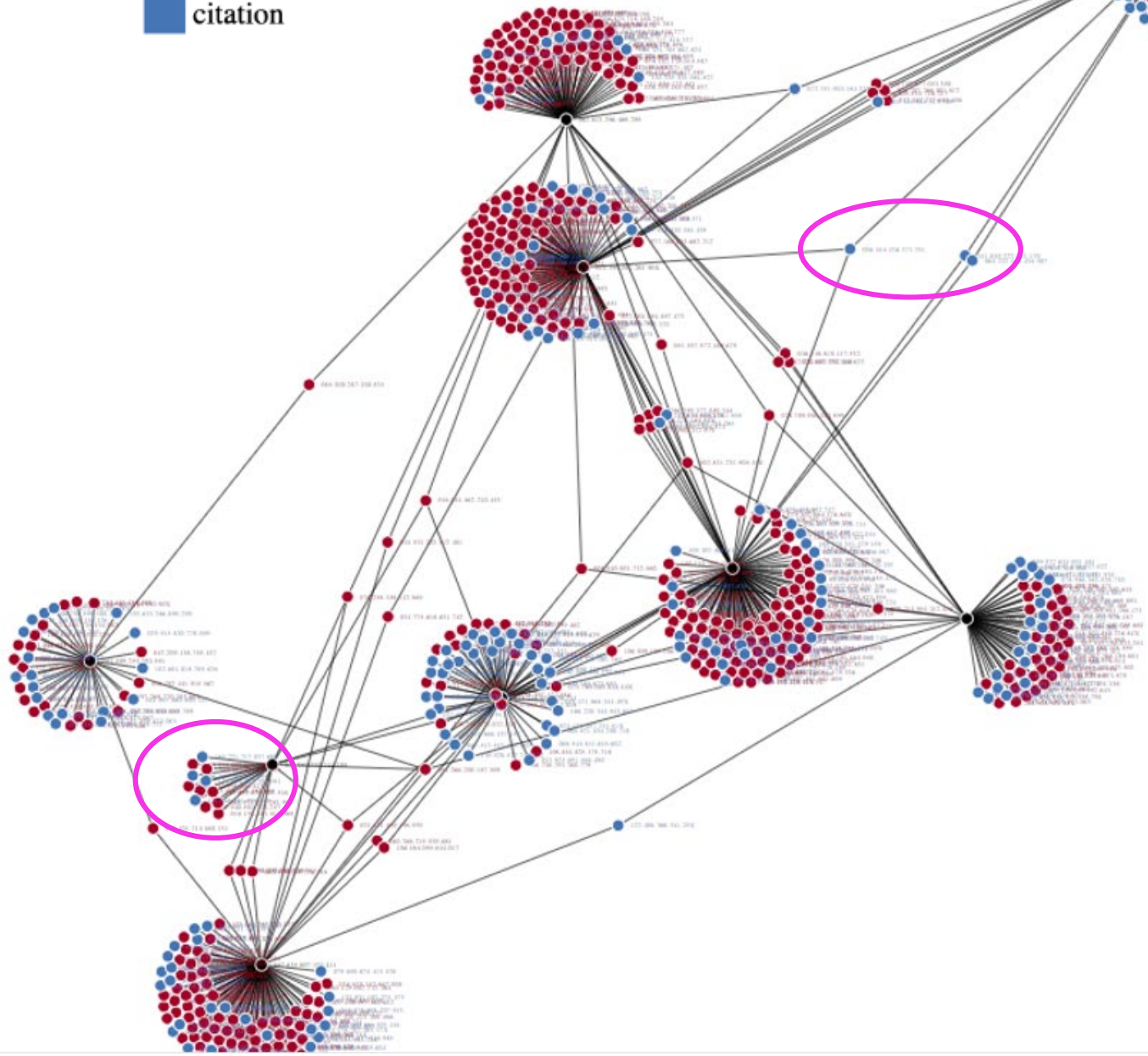
Unknown Document Open Access [Journal of Big Data](#), Volume: 6, Issue: 1, Pages: 1-18. Oct 19, 2019

Authors: Claus Boye Asmussen ¹, Charles Møller ¹

Citing Patents: 0 [Citing Scholarly Works: 0](#) [Reference Count: 31](#) [Collections: 4](#)

Additional Info: Open Access Abstract Affiliation Field of Study Published

Summary **162 Citing Works** 31 References Recommended Collections



Eks: delte citationer fra Citationchaser – new interesting stuff

The application of artificial intelligence on different types of literature reviews - A comparative study

Conference Proceedings Article

2022 International Conference on Applied Artificial Intelligence (ICAPAI), May 5, 2022

Authors: Henry Muller , Simran Pachnanda , Felix Pahl , Christopher Rosenqvist

Citing Patents: 0 Citing Scholarly Works: 0 Reference Count: 19 [141-624-362-392-581](#)

[10.1109/icapai55158.2022.9801564](#) [W4283367682](#) [LibKey](#) [WorldCat](#)

The SAFE Procedure: A Practical Stopping Heuristic for Active Learning-Based Screening in Systematic Reviews and Meta-Analyses

Preprint [Open Access](#) Aug 1, 2023

Authors: Josien Boetje , Rens van de Schoot

Citing Patents: 0 Citing Scholarly Works: 0 Reference Count: 28 Collections: 1

[147-304-735-914-289](#)

[10.21203/rs.3.rs-2856011/v1](#) [W4385461860](#) [LibKey](#) [WorldCat](#)

AI-Based Literature Reviews: A Topic Modeling Approach

Journal Article [Open Access](#)

SRELS Journal of Information Management, Pages: 97-104. May 13, 2023

Authors: Manoj Kumar Verma , Mayank Yuvaraj

Citing Patents: 0 Citing Scholarly Works: 0 Reference Count: 21 [008-444-426-373-751](#)

[10.17821/srels/2023/v60i2/170967](#) [W4376615575](#) [LibKey](#) [WorldCat](#)

The use of artificial intelligence for automating or semi-automating biomedical literature analyses: A scoping review.

Journal Article [Journal of biomedical informatics](#), Volume: 142, Pages: 104389-104389. May 13, 2023

Authors: Álisson Oliveira Dos Santos , Eduardo Sergio da Silva , Letícia Machado Couto , Gustavo Valadares Labanca Reis , Vinícius Silva Belo

Citing Patents: 0 Citing Scholarly Works: 1 Reference Count: 252 Collections: 3

[122-408-366-341-25X](#)

[10.1016/j.jbi.2023.104389](#) [37187321](#) [W4376619531](#) [LibKey](#) [WorldCat](#)

The importance of theoretical positioning and the relevance of using bibliometrics for literature reviews

Journal Article [Journal of Decision Systems](#), Pages: 1-16. Jun 12, 2023

Authors: Frantz Rowe , Nada Kanita , Isabelle Walsh

Citing Patents: 0 Citing Scholarly Works: 0 Reference Count: 27 [084-232-189-434-507](#)

[3.2217646](#) [W4380486545](#) [LibKey](#) [WorldCat](#)


Eksempler på delte citationer fra CitationChaser:


- Large Language Model Demonstrates Human-Comparable Sensitivity in Initial
- Screening of Systematic Reviews: A Semi-Automated Strategy Using GPT-3.5

Preprint Jan 1, 2023


Authors: Kentaro Matsui, Tomohiro Utsumi, Yumi Aoki, Taku Maruki, Masahiro Takeshima, Takaesu Yoshikazu

Citing Patents: 0 Citing Scholarly Works: 0 Reference Count: 18 [060-521-104-200-710](https://doi.org/10.60521-104-200-710)

 10.2139/ssrn.4520426

 W4385356790

 LibKey

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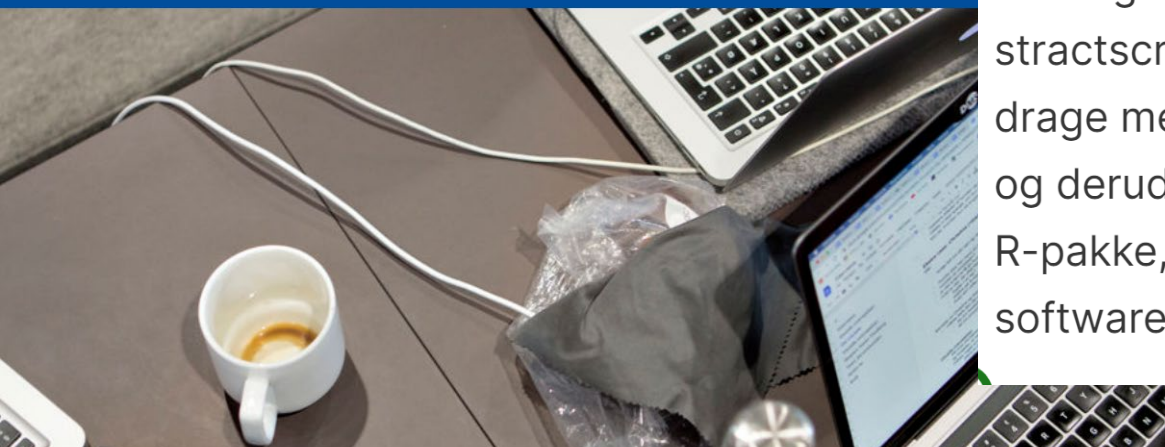
UNDERSØGELSE I GANG — 1. MAJ 2023 - 1. JUL 2024

Using AI Tools to Screen Titles and Abstracts in Literature Reviews: Common Guidelines and Introducing the AlscreenR R Package

UNDERSØGELSENS DELTAGERE: [Mikkel Holding Vemby](#) [Julian Christensen](#)

Formål

Hovedformålet med projektet er at undersøge om – og i givet fald hvordan – kunstig intelligens (AI), såsom ChatGPT, kan bidrage til at udføre titel- og abstractscreening på store mængder af bibliometriske data. Projektet vil dels bidrage med udvikling og test af arbejdsgange til den AI-assisterede screening, og derudover vil der som led i projektet blive udviklet ny software i form af en R-pakke, der kan automatisere screeningen. Det er forventningen, at man med softwaren vil kunne screene op mod **100.000 titler og abstracts på en uge**.



Files

master

Go to file

- Cross Validation Result.xlsx
- Output.html
- Topic modeling R-Code.Rmd

Smart-Literature-Review / Topic modeling R-Code.Rmd

Code Blame 241 lines (194 loc) · 7.78 KB

Raw Copy Download

```

22
23 #Get and load PDF's
24 ```{r}
25 files <- list.files(path = "C:\\Users\\cb:
26
27 Rpdf <- readPDF(control = list(text = "-layout"))
28
29 setwd("C:\\Users\\cba\\OneDrive - Aalborg Universitet\\Papers\\Litterature_after_duplicates")
30 ###Remember to manually set working directory
31 documents <- lapply(files, pdf_text) #%% read_lines()
32
33 corp <- Corpus(VectorSource(documents))
34
35 ##Clean text
36 corp <-tm_map(corp,content_transformer(tolower))
37
38 #remove punctuation
39 corp <- tm_map(corp, removePunctuation)
40 #Strip digits
41 corp <- tm_map(corp, removeNumbers)
42 #remove stopwords
43 corp <- tm_map(corp, removeWords, stopwords("english"))
44 #remove whitespace
45 corp <- tm_map(corp, stripWhitespace)
46 #Remove URL
47 urlPat<-function(x) gsub("(ftp|http)(s?)://.*\\b", "", x)
48 corp<-tm_map(corp, urlPat)
49 #Remove Email
50 emlPat<-function(x) gsub("\\b[A-Z a-z 0-9._ - ]*@[.*?][.]{1,3} \\b", "", x)
51 corp<- tm_map(corp, emlPat)
52
53 #Stem document
54 corp <- tm_map(corp,stemDocument)
55
56 #Remove stopwords

```

Asmussen & Møllers
 Topic modeling R-code
 tilgængelig i github
<https://github.com/clusba/Smart-Literature-Review>



▼ Yesterday's Recommendations

New Recommendations for [All Papers](#)

Search strategies (filters) to identify systematic reviews in MEDLINE and Embase.

[C. E. Escobar Liquitay](#), [L. Garegnani](#), [V. Garrote](#), [Ivan Solà](#), [Juan V A Franco](#) · Medicine ·

Cochrane Database of Systematic Reviews · 8 September 2023

BACKGROUND Bibliographic databases provide access to an international body of scientific literature in health and medical sciences. Systematic reviews are an important source of evidence for... [Expand](#)

👍 1 · [PubMed](#) [Save](#) [Alert](#) [Cite](#) [Not Relevant](#)

CRUISE-Screening: Living Literature Reviews Toolbox

[Wojciech Kusa](#), [Petr Knoth](#), [A. Hanbury](#) · Computer Science · [arXiv.org](#) · 4 September 2023

Keeping up with research and finding related work is still a time-consuming task for academics. Researchers sift through thousands of studies to identify a few relevant ones. Automation techniques... [Expand](#)

[arXiv](#) [Save](#) [Alert](#) [Cite](#) [Not Relevant](#)

Can artificial intelligence separate the wheat from the chaff in systematic reviews of health economic articles?

[M. O. Oude Wolcherink](#), [X. Pouwels](#), [S. V. van Dijk](#), [C. Doggen](#), [H. Koffijberg](#) · Medicine ·

Expert review of pharmacoeconomics & outcomes... · 13 August 2023

OBJECTIVES Artificial intelligence-powered tools, such as ASReview, could reduce the burden of title and abstract screening. This study aimed to assess the accuracy and efficiency of using ASReview... [Expand](#)

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Viewing...

2/2

[All Papers](#)

[CLR](#)

Library in Semantic Scholar med 9-10 artikler → får gode relevante “recommendations”

Test af ASReview – juni-august 2023

ASReview LAB

← Projects



Your project
CLR test

Analytics

Review

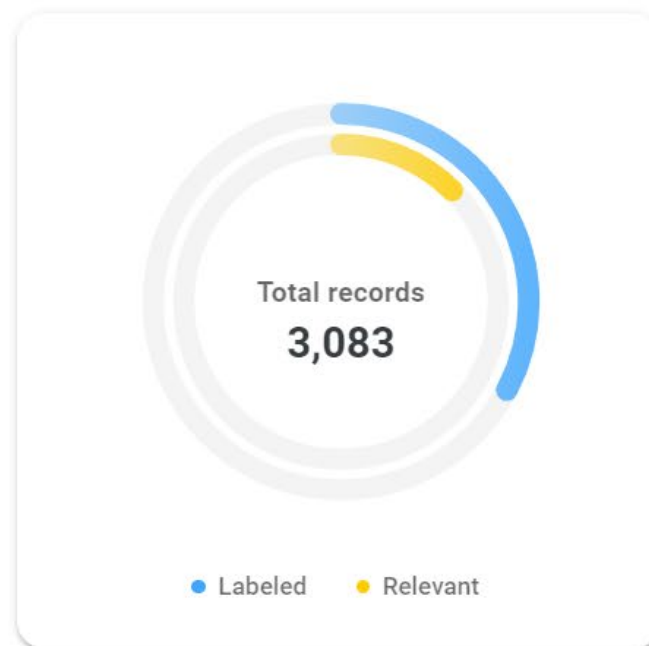
History

Export



**DET KGL.
BIBLIOTEK**
Royal Danish Library

Analytics



Labeled records

1,009

Relevant records

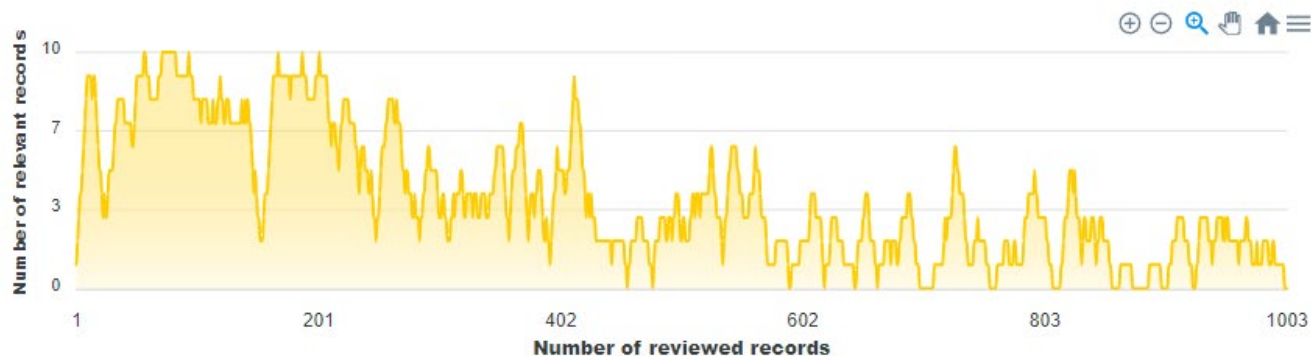
385

Irrelevant records since last relevant

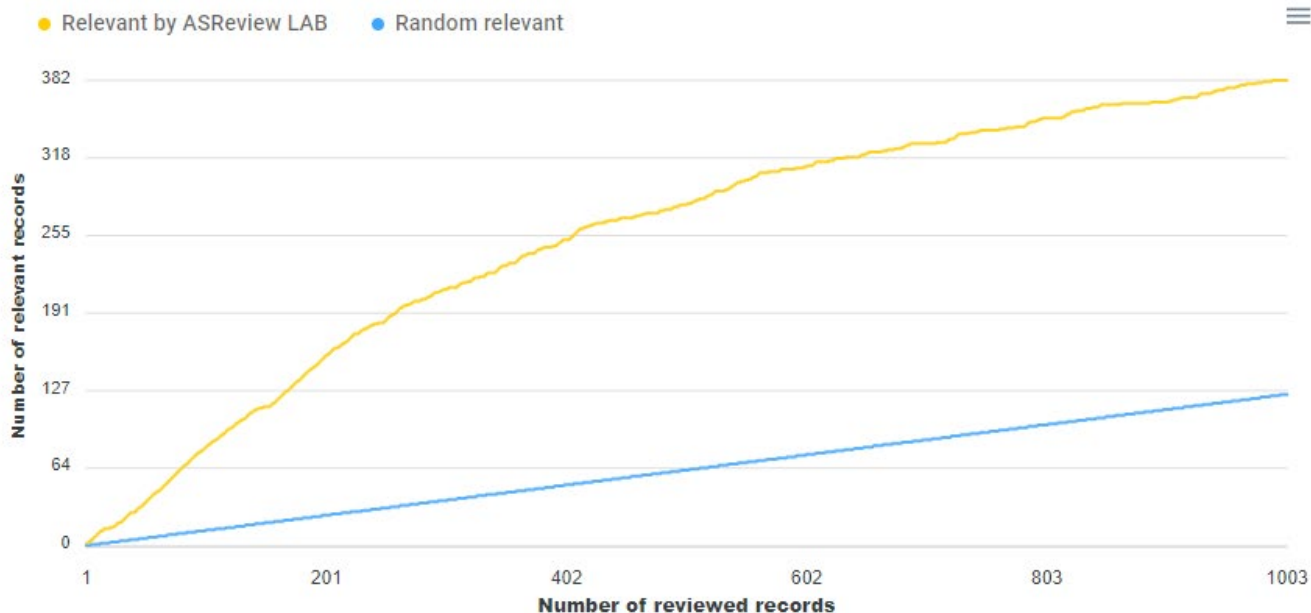
12

november 2023

Progress ?



Recall



- Lader til at den prioriterer
- Kun full text screening (Ikke første step med ti,ab screening som i fx Covidence)
- Kun ja/nej (ikke måske)
- Export option: csv, ris,

Test of upload of 7 pdf's 15 columns

Outcome	Replication	Replicate	reproducible	transparent
<p>What is the purpose of the study?</p> <p>The purpose of the study is to provide a comparison between the results of ML/AI driven literature review tools and those of a study conducted by humans, and to provide insights into the usefulness and trade offs of available AI and ML tools for literature reviewing. The study also aims to demonstrate the power and limits of ML to replicate and expand upon human efforts, and to show that ML can reinforce human findings to support replicability and robustness</p>	<p>The text mentions replication, stating that "scrutiny of replication and rigor [in entrepreneurship and small business management scholarship] is becoming increasingly prevalent" and that "the replication crisis in general management research is far reaching." However, it does not provide a specific answer to a question about replication</p>	<p>The text answers the question. The authors investigate how scholars in entrepreneurship and small business management can capitalize on AI and ML to support their scholarship and comprehensively review, catalog, and analyze the literature</p>	<p>The text mentions replicability of human findings through the use of ML</p>	<p>The text mentions that ML can add additional layers of transparency and validity to conclusions from human derived systematic reviews</p>
<p>What was the outcome of the case?</p> <p>The outcome of the case was an overview of the research areas within the paper corpus, represented by the 20 topics and the 10 sub topics. The framework successfully placed the selected papers into groups of papers that resemble each other, and the grouping and selection of papers in the literature review, based on the framework, did make semantic sense and was successfully used for a literature review. The framework has proven its utility in enabling a faster and more comprehensive exploratory literature review, as compared to competing methods</p>	<p>What method was used to calculate perplexity?</p> <p>The method used to calculate perplexity was the perplexity method in the 'topicmodels' R library</p>	<p>What is the aim of the paper?</p> <p>The aim of the paper is to enable the use of topic modelling for researchers by presenting a step by step framework on a case and sharing a code template</p>	<p>The framework enables huge amounts of papers to be reviewed in a transparent, reliable, faster, and reproducible way</p>	<p>The framework enables huge amounts of papers to be reviewed in a transparent, reliable, faster, and reproducible way</p>

Experiences, Elicit

- First analysis and summary of research question and data extraction: 400 credits
- I could reproduce the summary from day to day – And it was confirmed by 2 colleagues
- Preliminary analysis of 5 uploaded pdf's with 11 columns cost me ~ 1000 credits
 - added 2 more pdfs – 15 columns
 - 200 credits ??

➤ The network seems trustworthy

How accurate is Elicit?

Elicit uses language models to extract data from and summarize research papers. As a new technology, language models sometimes make up inaccurate answers (called hallucination).

We reduce hallucination and increase accuracy by:

Training our models on specific tasks

We fine-tune our models on a per-task basis and constantly iterate to make them more accurate.

Searching over academic papers

Elicit only shows you papers that actually exist and are part of the scientific literature.

Making it easy to double-check answers

We make it easy for you to view the original source and point you to where in a paper specific information came from.

Eksempler på tjeklister ift computational research

Table 9

Reproducibility enabling information checklist for text mining studies.

Item no.	Information elements	Yes	No	N/A
1	Original location of the raw dataset			
2	Provided link to local copy of: a. Raw dataset b. Target dataset c. Cleaned dataset			
3	Described the internal structure of: a. Raw dataset b. Target dataset c. Cleaned dataset			
4	Data retrieval method details			
5	Data extraction method described			
6	Pre-processing details			
7	Feature representation technique			
8	Feature selection technique			
9	Dimensionality reduction technique			
10	Final feature vector download link			
11	Training algorithm			
12	Custom algorithm a. Text b. Code c. Algorithm d. Executable file			
14	Model assessment method			
15	Detailed model assessment result			
16	Necessary seed values provided			
17	Training/test data partition available or indices provided a. Link to data partitions provided b. (link to) Indices provided c. Seed value provided			
18	Provide name and version number of third party or external software package used			

Olorisade, B.K., Brereton, P., & András, P. (2017). Reproducibility of studies on text mining for citation screening in systematic reviews: Evaluation and checklist. *Journal of biomedical informatics*, 73, 1–13.

Table 1
Overview of the four phases of the SAFE procedure.

Phase	Name	Goal	Dataset	Model	Prior knowledge	Stopping heuristic(s)
1	Screen a random set	<ul style="list-style-type: none"> Partly label the dataset to warm-up the AI model; get an indication of the fraction of relevant records (FRR_T) 	Random subset	-	-	<ul style="list-style-type: none"> screen a minimum of 1% of the total number of papers; find at least one relevant record.
2	Active learning	find as many relevant records as possible	Complete dataset	simple model (e.g. Naive Bayes or logistic regression as classifier and TF-IDF as feature extractor)	labeled records phase 1	<ul style="list-style-type: none"> All key papers have been marked as relevant; At least twice the RR_T records have been screened; A minimum of 10% of the total dataset has been screened. No extra relevant records have been identified in the last 50 records.
3	Find more records using a different model	ensure that records are not missed due to suboptimal choice of the active learning model	Complete dataset	deep learning model (e.g. neural network as a classifier and sBert as a feature extractor)	labeled records phase 1 and 2	No extra relevant records are identified in the last 50 records.

Tjekliste ift at stoppe screening når man benytter sig af Active learning

Phase	Name	Goal	Dataset	Model	Prior knowledge	Stopping heuristic(s)
4	Evaluate quality	avoid incorrectly excluding relevant records	Records labeled as irrelevant in phase 1, 2 and 3 plus the 10 highest-ranked records from phase 2	simple model (see phase 1)	the 10 highest- and lowest-ranked papers from phase 2	No extra relevant records are identified in the last 50 records.

Boetje, J., & van de Schoot, R. (2023). The SAFE Procedure: A Practical Stopping Heuristic for Active Learning-Based Screening in Systematic Reviews and Meta-Analyses. *Meta-analysis*, 2023. <https://doi.org/10.21203/rs.3.rs-2856011/v1>