How to search for, find and record “related work”

Přemek Brada

2022+

Research

More than 1.500.000 papers in 2013!

Wanna stay on top of things?

Read more than 4000 papers PER DAY

365 days per year!!!

http://www.quora.com/How-many-academic-papers-are-published-each-year

“Related Work”?

- State of the Art
- Related Knowledge/Results
- List of references

148. Willebeek-LeMair, M., Reeves, A., Center, I., and Heights, Y. 1993. Strategies for dynamic load balancing on highly parallel computers. IEEE Trans. Parall. Distrib. Syst. 4, 9, 979--993.

149. Woodside, C. M. and Menascé, D. A. 2006. Guest editors' introduction: Application-level QoS. IEEE Intern. Comput. 10, 3, 13--15.

150. Zhang, J. 2007. A formal approach to providing assurance to dynamically adaptive software. Ph.D. thesis, Michigan State University.

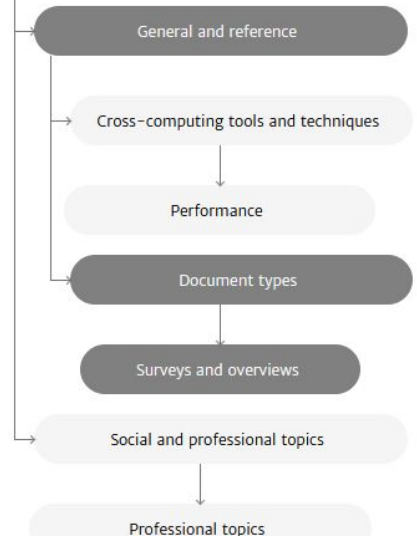
Show Fewer References

Index Terms

Self-adaptive software: Landscape and research challenges

*"Indeed, one of my major complaints about the computer field is that whereas Newton could say, "**If I have seen a little farther than others, it is because I have stood on the shoulders of giants,**" I am forced to say, "Today we stand on each other's feet." Perhaps the central problem we face in all of computer science is how we are to get to the situation where we build on top of the work of others rather than redoing so much of it in a trivially different way. Science is supposed to be cumulative, not almost endless duplication of the same kind of things".*

Richard Hamming 1968 Turning Award Lecture



Network performance evaluation

Start with Research Questions (or proposed contributions)

“If you don’t know where you are going, any road will do.”

RQs

- meaningful and important to practitioners as well as researchers
- lead to changes in current practice or validate a current practice
- identify discrepancies between commonly held beliefs and reality

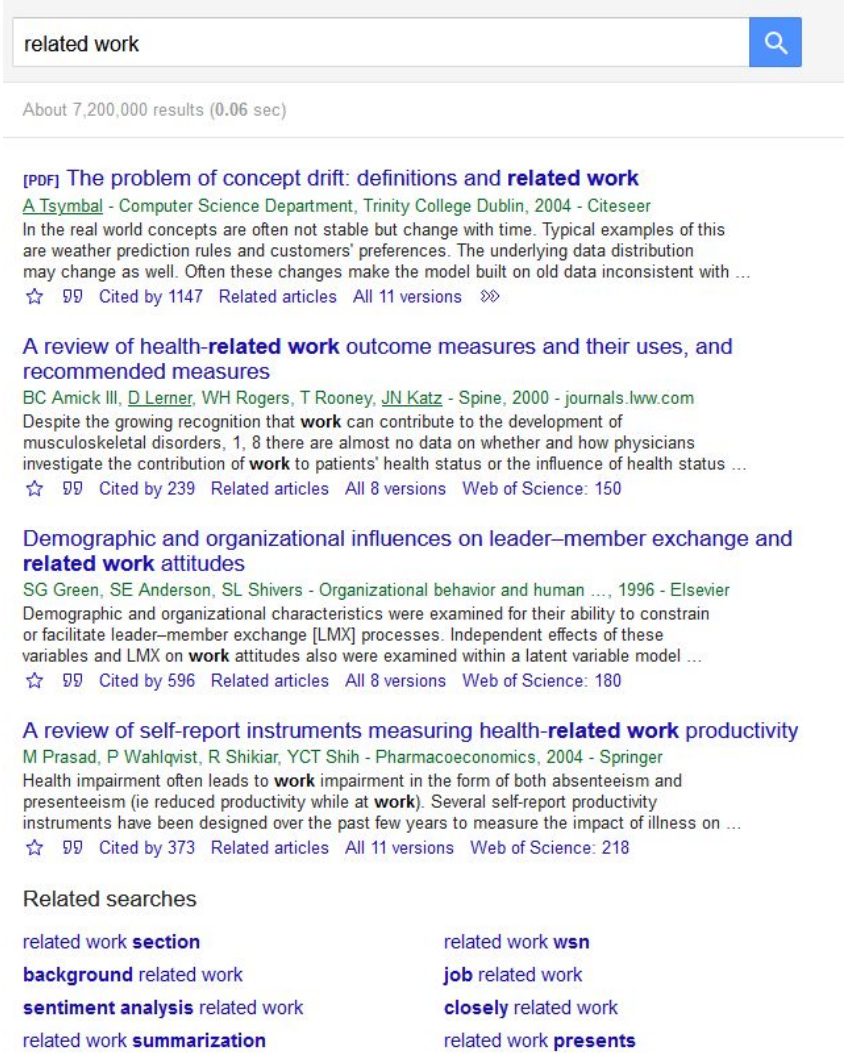
Question 1: What evidence is there that cross-company estimation models are not significantly different from within-company estimation models for predicting effort for software/Web projects?

SQ 1.1 – What are the factors that affect expert judgment software estimation?

Why (Microsoft) practitioners view some research ideas as unwise?

Where does it come from?

- Begin at the beginning…
  - discipline / area
  - *research questions*
- Where to seek
  - *previous knowledge*
  - books and journals (uni library)
  - IEEE DL, ACM DL, Springer Link, Elsevier, …
  - Google Scholar
  - ResearchGate
  - generic search engine
- What can be found
  - Open vs Closed sources, OA
  - *seminal and survey papers*
  - grey literature
  - datasets



What's worth what

- Text
  - Title
  - Abstract
  - Introduction - Conclusion
- "Popularity"
  - venue
  - citations
  - page rank
- Author
  - organization/group
  - references, seniority level

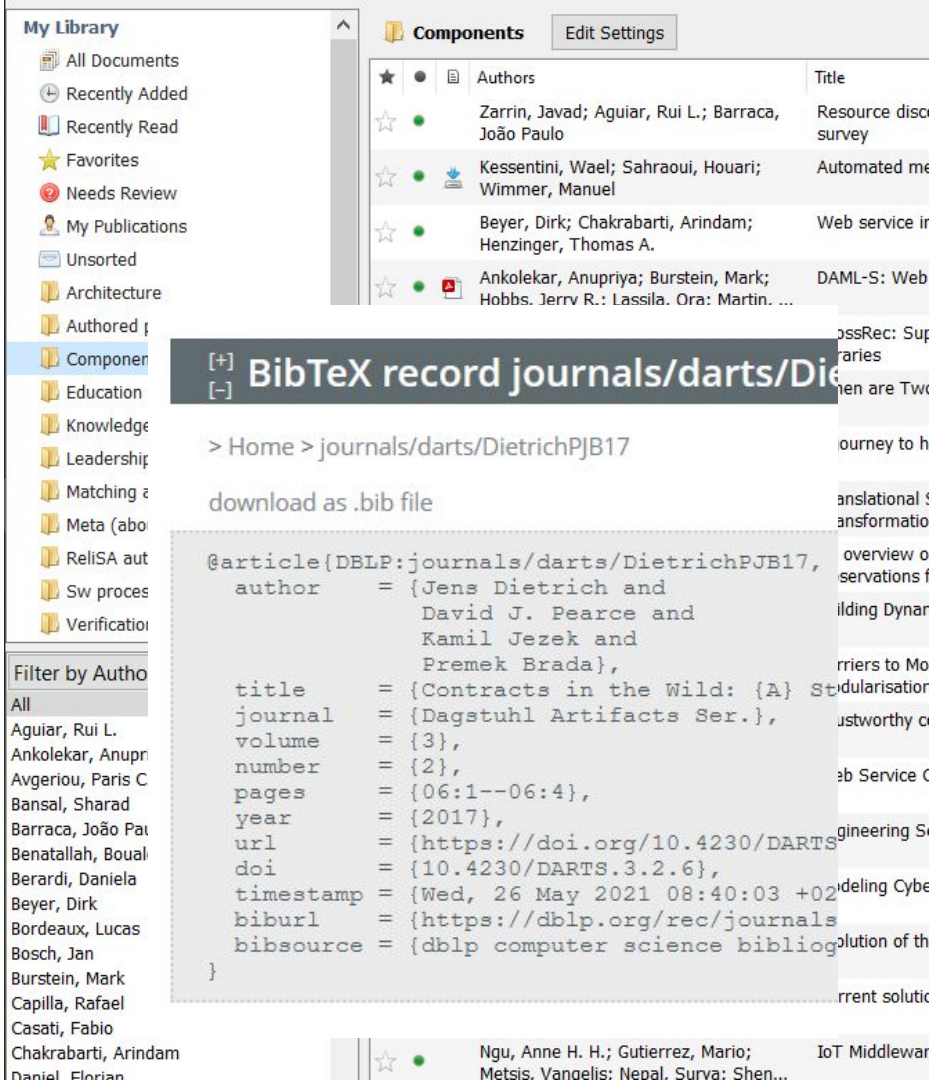
→ Griswold: *How to Read …*



I have found one! Now what?

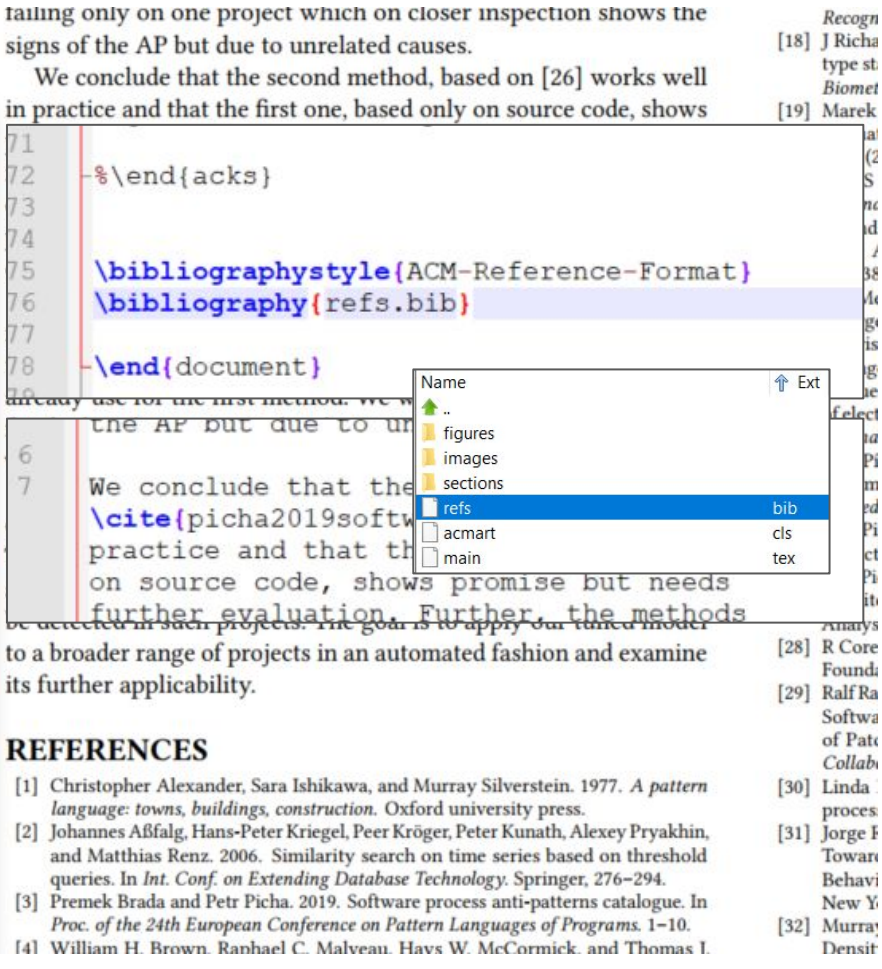
Your memory is your greatest enemy

- Recording the citation record
  - *anatomy of the record, DOI*
  - BiBTex, Word
  - Mendeley, Zotero; JabRef
- Recording the text (document)
  - filesystem
  - Mendeley, Zotero
  - ResearchGate
- Consistency & findability
  - id, filename



Keeping and creating the lists

- Lists of citation records
  - uber-file vs thematic vs project-based
- List of references
  - *don't write, generate!*
  - reference manager -> BiBTex + LaTeX
  - Word



Systematic Literature Reviews

From “Related work” to SLR

Related work

- review existing knowledge relevant to presented work
- don’t reinvent the wheel; understand leading edge

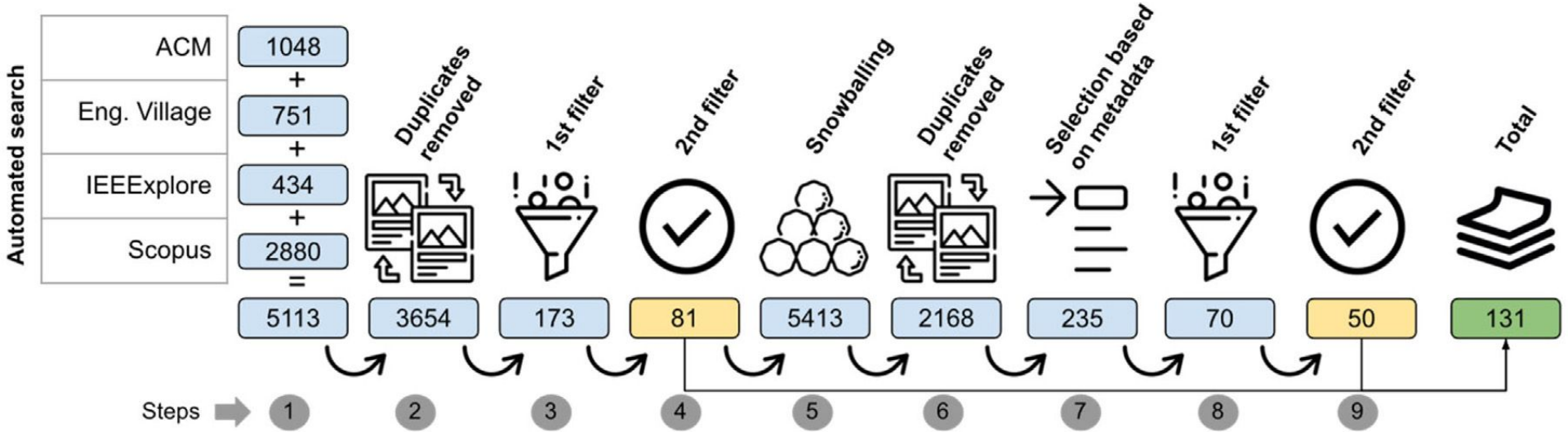
Mapping studies and SLRs

- (try to) find / capture all published primary research on a topic
- extract main themes, summarize finding, define open problems (gaps)

SLR Method

Kitchenham, Barbara. Procedures for Performing Systematic Reviews. Keele University, UK, 2004.

Kitchenham, Barbara Ann, David Budgen, and Pearl Brereton. Evidence-based software engineering and systematic reviews. Chapman and Hall/CRC, 2019.



SLR Method

(Kitchenham 2004)

The stages associated with *planning the review* are:

- Identification of the need for a review (See Section 5.1).
- Commissioning a review (See Section 5.2).
- Specifying the research question(s) (See Section 5.3).
- Developing a review protocol (See Section 5.4).
- Evaluating the review protocol (See Section 5.5).

The stages associated with *conducting the review* are:

- Identification of research (See Section 6.1).
- Selection of primary studies (See Section 6.2).
- Study quality assessment (See Section 6.3).
- Data extraction and monitoring (See Section 6.4).
- Data synthesis (See Section 6.5).

The stages associated with *reporting the review* are:

- Specifying dissemination mechanisms (See Section 7.1).
- Formatting the main report (See Section 7.2).
- Evaluating the report (See Section 7.3).

SLR Method - the protocol

- The strategy that will be used to search for primary studies including search terms and resources to be searched. Resources include digital libraries, specific journals, and conference proceedings. An initial mapping study can help determine an appropriate strategy.
- Study selection criteria. Study selection criteria are used to determine which studies are included in, or excluded from, a systematic review. It is usually helpful to pilot the selection criteria on a subset of primary studies.
- Study selection procedures. The protocol should describe how the selection criteria will be applied e.g. how many assessors will evaluate each prospective primary study, and how disagreements among assessors will be resolved.
- Study quality assessment checklists and procedures. The researchers should develop quality checklists to assess the individual studies. The purpose of the quality assessment will guide the development of checklists.
- Data extraction strategy. This defines how the information required from each primary study will be obtained. If the data require manipulation or assumptions and inferences to be made, the protocol should specify an appropriate validation process.

SLR Method - the research

- Preliminary searches aimed at both identifying existing systematic reviews and assessing the volume of potentially relevant studies.
- Trial searches using various combinations of search terms derived from the research question.
- Checking trial research strings against lists of already known primary studies.
- Consultations with experts in the field.

… also

"snowballing"

- Reference lists from relevant primary studies and review articles
- Journals (including company journals such as the IBM Journal of Research and Development), grey literature (i.e. technical reports, work in progress) and conference proceedings
- Research registers
- The Internet.
- Scanning the grey literature
- Scanning conference proceedings

The review must be documented in sufficient detail for readers to be able to assess the thoroughness of the search.

Examples

A survey on engineering approaches for self-adaptive systems

Christian Krupitzer [a,*], Felix Maximilian Roth [a], Sebastian VanSyckel [a], Gregor Schiele [b], Christian Becker [a]

[a] University of Mannheim, Schloss, 68131 Mannheim, Germany
[b] Insight Research Centre, National University of Ireland, Galway IDA Business Park, Galway, Ireland

ARTICLE INFO

Article history:
Available online 8 October 2014

Keywords:
Taxonomy
Self-adaptation
Survey
Self-adaptive systems
Context adaptation

ABSTRACT

The complexity of information systems is increasing in recent years, leading to increased effort for maintenance and configuration. Self-adaptive systems (SASs) address this issue. Due to new computing trends, such as pervasive computing, miniaturization of IT leads to mobile devices with the emerging need for context adaptation. Therefore, it is beneficial that devices are able to adapt context. Hence, we propose to extend the definition of SASs and include context adaptation. This paper presents a taxonomy of self-adaptation and a survey on engineering SASs. Based on the taxonomy and the survey, we motivate a new perspective on SAS including context adaptation.

© 2014 Elsevier B.V. All rights reserved.

Examples

SEXTAMT: A systematic map to navigate the wide seas of factors affecting expert judgment software estimates☆



Patrícia Gomes Fernandes Matsubara [a,b,*], Bruno Freitas Gadelha [a], Igor Steinmacher [c,d], Tayana Uchôa Conte [a]

[a] Institute of Computing of the Federal University of Amazonas (UFAM), Brazil
[b] Faculty of Computing of the Federal University of Mato Grosso do Sul (UFMS), Brazil
[c] Federal University of Technology - Paraná (UTFPR), Brazil
[d] Northern Arizona University (NAU), United States of America

ARTICLE INFO

Article history:
Received 30 April 2021
Received in revised form 11 November 2021
Accepted 12 November 2021
Available online 29 November 2021

Keywords:
Expert judgment
Software effort estimation

ABSTRACT

Context: Software projects involve technical and managerial activities, including software estimation. Inaccurate estimates are harmful and improving estimation methods is not enough: we need to understand more of the factors that impact estimates.
Objective: Our study aims to identify the existing evidence about the factors that affect estimates in software projects when using expert judgment.
Method: We executed a Systematic Literature Mapping (SLM) based on database and snowballing searches, selecting papers by first reading their titles and abstracts and later reading the full text.
Results: Researchers investigated a wide range of different factors employing mostly laboratory research strategies and relying primarily on differences of estimates and participants' perceptions to measure the factors' effects. Resulting from our analysis, we present the SEXTAMT (Software Estimates of eXperts: A Map of influencing facTors), a map of factors affecting estimates built on three dimensions: project/iteration phase, stakeholders, and type of effect.
Conclusion: Over the years, researchers have investigated a varied set of factors. Many of them were explored in different studies, employing diverse research strategies. Such studies provide compelling evidence on the elements that influence expert judgment estimates, which can be used to assess and improve everyday estimation in the software industry.

© 2021 Elsevier Inc. All rights reserved.