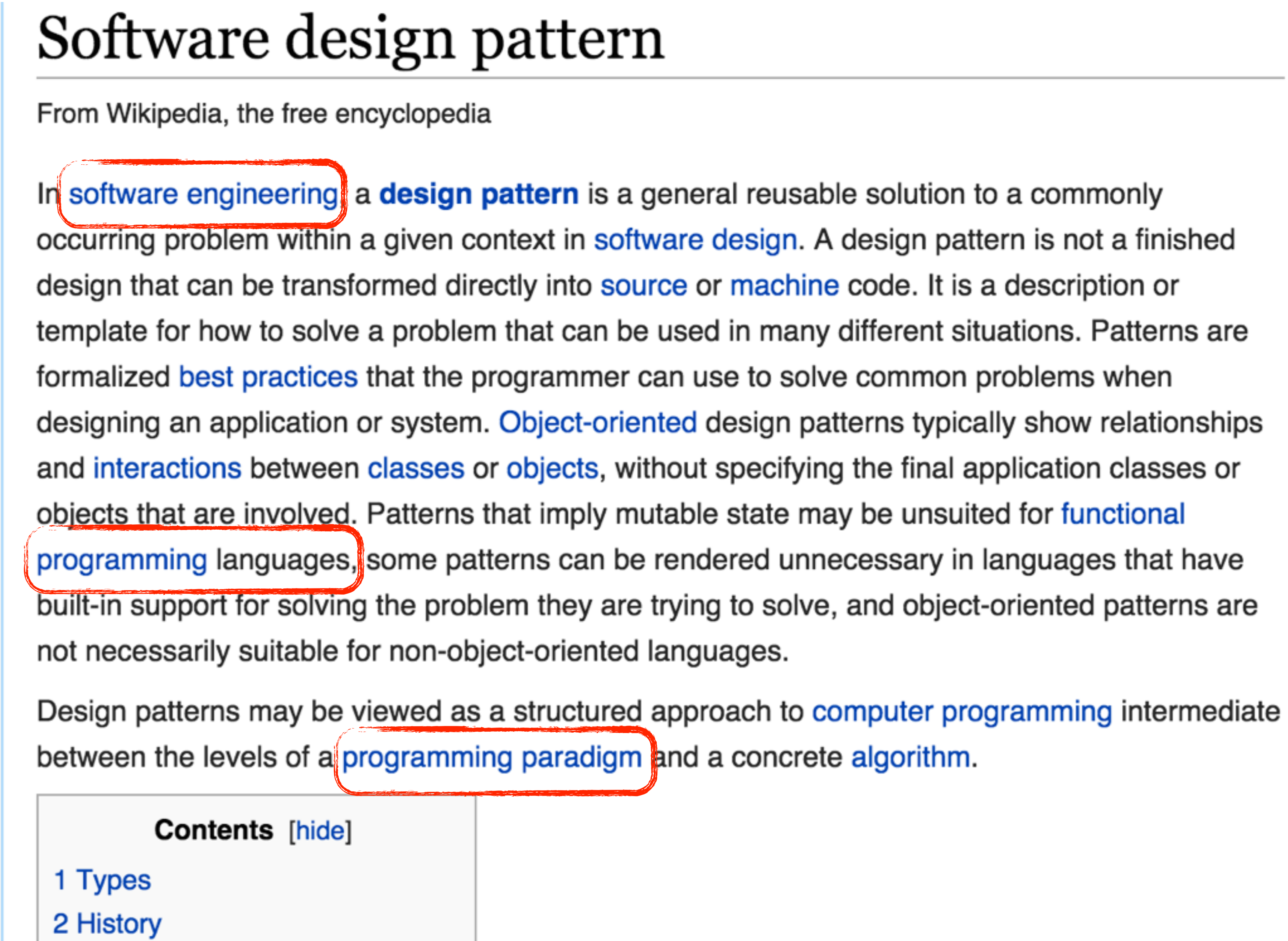
TDIU14

Föreläsning 2 - informationssökning och informationsvärdering

LINKÖPINGS UNIVERSITET

Informationssökning

Att hitta information



Software design pattern

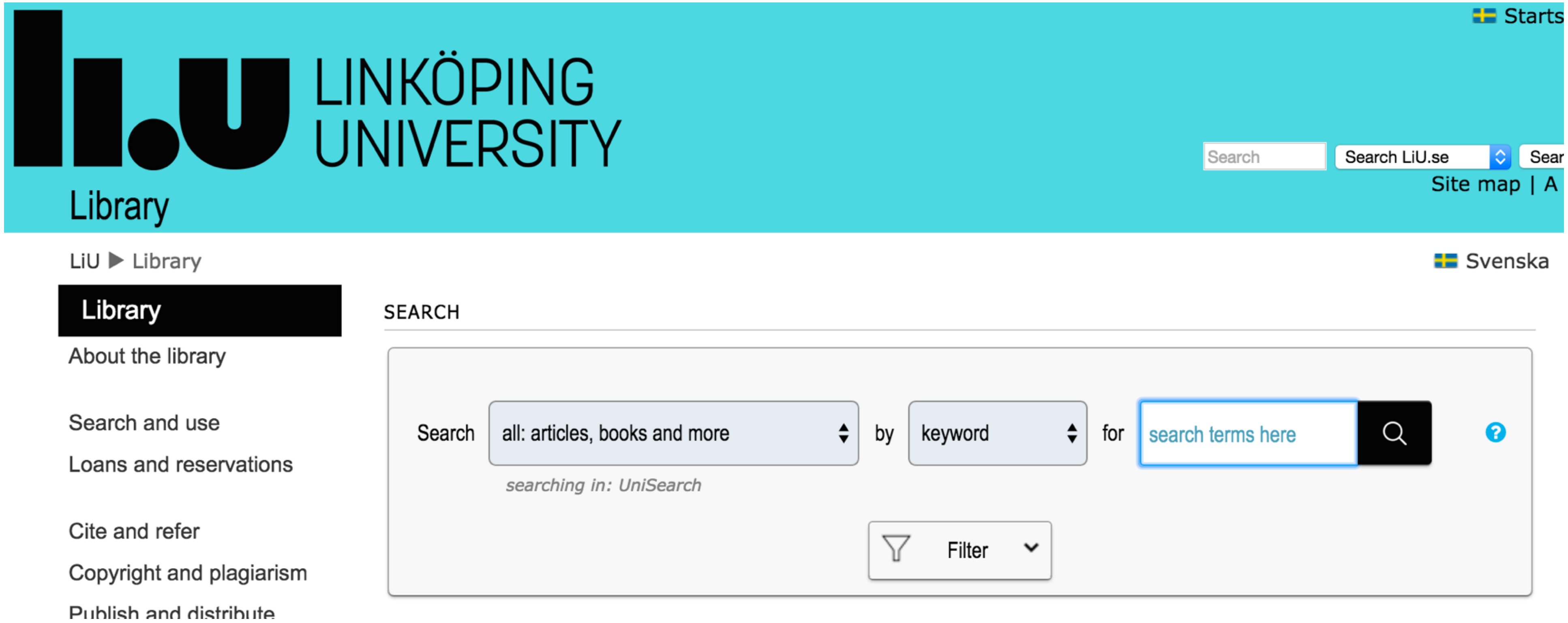
From Wikipedia, the free encyclopedia

In software engineering, a **design pattern** is a general reusable solution to a commonly occurring problem within a given context in software design. A design pattern is not a finished design that can be transformed directly into source or machine code. It is a description or template for how to solve a problem that can be used in many different situations. Patterns are formalized best practices that the programmer can use to solve common problems when designing an application or system. Object-oriented design patterns typically show relationships and interactions between classes or objects, without specifying the final application classes or objects that are involved. Patterns that imply mutable state may be unsuited for functional programming languages, some patterns can be rendered unnecessary in languages that have built-in support for solving the problem they are trying to solve, and object-oriented patterns are not necessarily suitable for non-object-oriented languages.

Design patterns may be viewed as a structured approach to computer programming intermediate between the levels of a programming paradigm and a concrete algorithm.

Contents [hide]

Stå på giganters axlar



SEARCH

Search all: articles, books and more by keyword for search terms here

searching in: UniSearch

Hur man hittar rätt sorts information

”HLA active probing runtime performance requirements in a Wide Area Network”

→

{ }

HLA

simulation

active probing

fault detection and localization

runtime performance requirements

latency, throughput

in a Wide Area Network

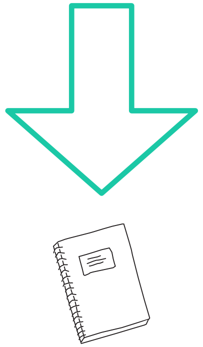
IP networks

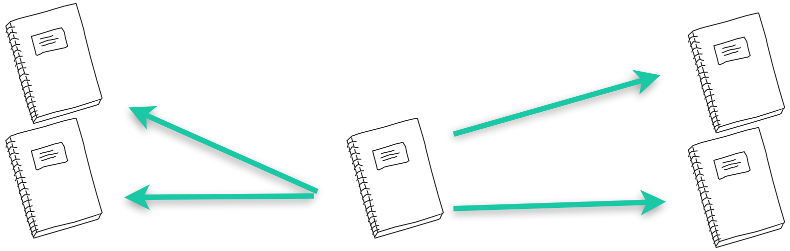
Engineering information vs Scientific information

	Ingenjörsskap	Vetenskap
Fråga	Hur löser jag ett problem?	Hur kan vi förklara något?
Tillit genom	Fungerande lösningar	Bekräftade teorier (i andra vetenskapliga arbeten)
Källor	Tekniska beskrivningar, programvaruprojekt	Vetenskapligt granskade publikationer

Iterativ sökning (”snowballing”)

Stå på giganters axlar





”On AI”

”On Planning”

”Fie Planner”

”Foo Heuristic”

”On Heuristic Search”

1

2

3

Vetenskapliga publikationer

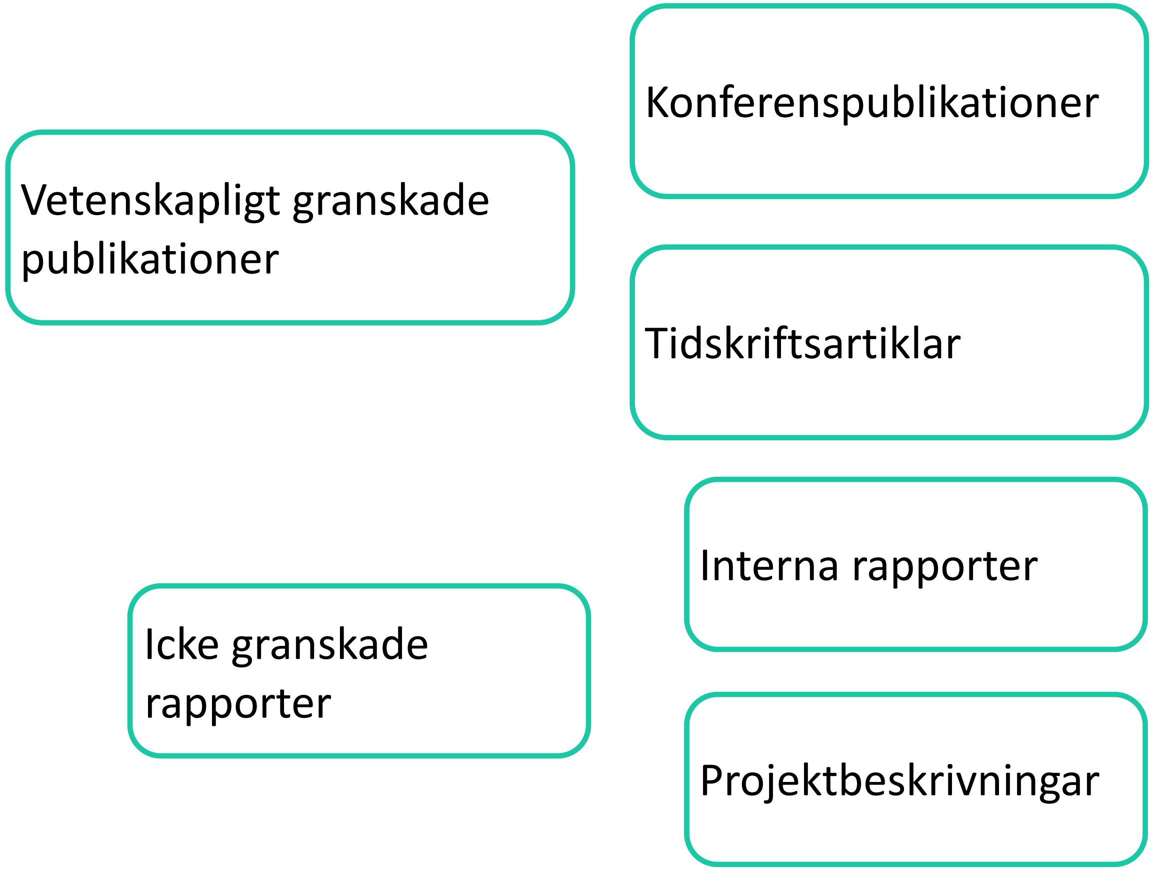
Primära källor (fallstudier, experiment, erfarenhetsrapporter)

Sekundära källor: Systematisk litteraturöversikt, kartläggningsstudier

Böcker, forskare som bloggar

"Vad"

Vetenskaplig publicering



Vetenskapligt granskade publikationer

Konferenspublikationer

Tidskriftsartiklar

Icke granskade rapporter

Interna rapporter

Projektbeskrivningar

”Hur”

Publikationstyper

P. Kruchten, H. Obbink, and J. Stafford. The past, present, and future for software architecture. *IEEE Software*, 23(2):22–30, March–April 2006.

No empirical results. Shares experience on Software Architecture research and development.

Publikationstyper

T. K. Paul and M. F. Lau. A systematic literature review on modified condition and decision coverage. In *Proceedings of the 29th Annual ACM Symposium on Applied Computing*, SAC ’14, pages 1301–1308, New York, NY, USA, 2014. ACM.

Systematic Literature Review, secondary study. Published at a conference

Publikationstyper

C. Wohlin, P. Runeson, M. Höst, M. C. Ohlsson, B. Regnell, and A. Wesslén. *Experimentation in Software Engineering*. Springer Berlin Heidelberg, 2012.

Guidelines textbook on empirical methods in Software Engineering

Publikationstyper

I. Maier, T. Rompf, and M. Odersky. Deprecating the observer pattern. Technical report, École Polytechnique Fédérale de Lausanne, 2010.

Technical report, non-reviewed publication. No empirical support for claims, but suggestions of an architecture.

Publikationstyper

A. Nilsson, J. Bosch, and C. Berger. Visualizing testing activities to support continuous integration: A multiple case study. In G. Cantone and M. Marchesi, editors, *Agile Processes in Software Engineering and Extreme Programming*, volume 179 of *Lecture Notes in Business Information Processing*, pages 171–186. Springer International Publishing, 2014.

Case study, reviewed publication in collection of papers published as chapter of a book. Probably from conference proceedings.

Publikationstyper

J. Andrews, L. Briand, and Y. Labiche. Is mutation an appropriate tool for testing experiments? In *Proceedings of the 27th International Conference on Software Engineering*, ICSE 2005, pages 402–411, May 2005. IEEE Computer Society.

Experiment, reviewed publication presented at a conference and published in proceedings from the conference.

Vad är giltiga resultat egentligen?

Type	How?	Quality
Procedure/ technique	Formal proofs, experiments, statistical support,	Proper use of statistics
Descriptive Models		Properly accounting for reality
Experience reports	Interviews, observations, usage data	Real systems & people

Shaw, M. (2003). Writing good software engineering research papers: A Minitutorial. In Proceedings of the 25th International Conference on Software Engineering, ICSE ’03, pages 726-736, Washington, DC, USA. IEEE Computer Society.

What are strong results?

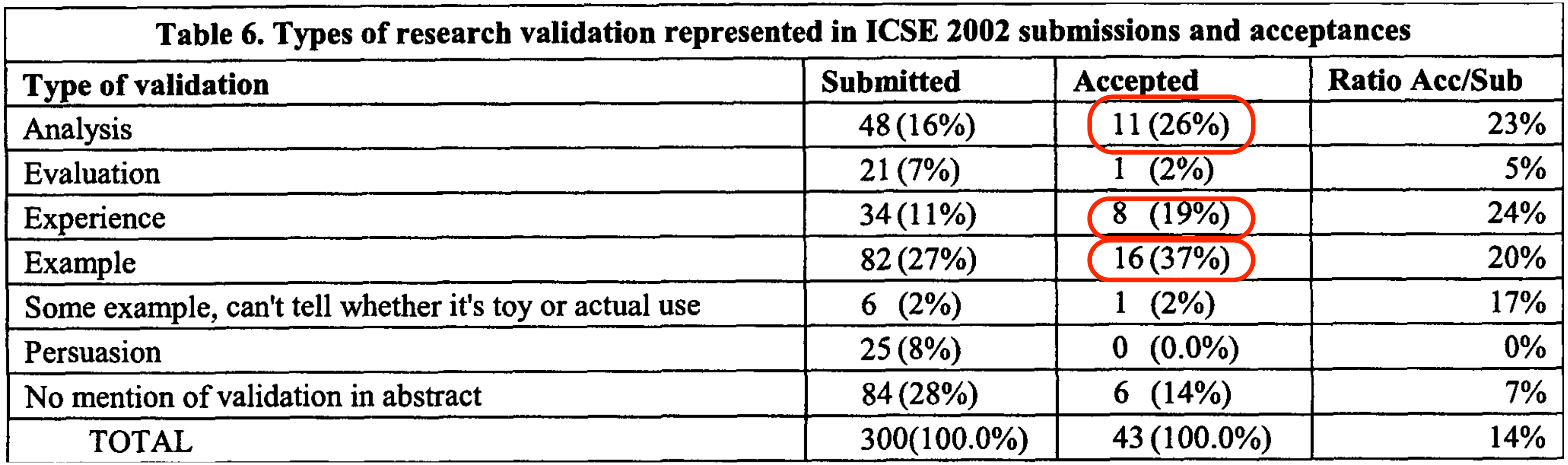


Table 6. Types of research validation represented in ICSE 2002 submissions and acceptances

Type of validation	Submitted	Accepted	Ratio Acc/Sub
Analysis	48 (16%)	11 (26%)	23%
Evaluation	21 (7%)	1 (2%)	5%
Experience	34 (11%)	8 (19%)	24%
Example	82 (27%)	16 (37%)	20%
Some example, can't tell whether it's toy or actual use	6 (2%)	1 (2%)	17%
Persuasion	25 (8%)	0 (0.0%)	0%
No mention of validation in abstract	84 (28%)	6 (14%)	7%
TOTAL	300(100.0%)	43 (100.0%)	14%

M. Shaw. Writing good software engineering research papers: Minitutorial. In *Proceedings of the 25th International Conference on Software Engineering*, ICSE ’03, pages 726–736, Washington, DC, USA, 2003. IEEE Computer Society.

Hur man kan utvärdera artiklar

- Relevans = f(title, year, abstract, citations)
- Ju nyare och mer specifikt, desto färre citeringar
- Litteraturöversikter
- Typer av publikationer: tidskrifter, konferenser, bokkapitel
- Det är de huvudsakliga resultaten från artiklar ni kan hänvisa till och utvärdera, inte introduktion

What about white papers/other stuff?

- Use to support existence: ”There are several implementations of Flux controllers”
- Not to support claims and propositions: ”Flux controllers are more user friendly than Flax controllers”

Evaluation of paper

”Software product lines are related software products that are customized to different customers [1]”

[1] Kästner, C., Apel, S., and Kuhlemann, M. Granularity in software product lines. In *Proceedings of the 30th International Conference on Software Engineering*, ICSE ’08, pages 311–320, New York, USA, 2008.

Not the main result of [1]

[2] Pohl, K., Böckle, G., and van der Linden, F. J. (2005). *Software product line engineering: foundations, principles and techniques*. Springer Science & Business Media.

Use book by Pohl et al. instead [2]

Theory

- **Analysis**: what is this? Classifications, taxonomies, ontologies
- **Explanations**: why does something happen?
- **Predictions**: what will happen?

What kind of theory is useful here?

- ”What determines test case flakiness?”
- ”What are common practices for using React Native in a small agile team?”
- ”How can we automate visual interface testing of embedded systems?”

Mathematical foundations

Software Engineering/ Computer Science

Management/ organizational foundations

Plagiarism & copyright

Using image without reference

Plagiarism + copyright violation

Using image with reference

Copyright violation

Using own/CC image with reference

OK!

Using references

References

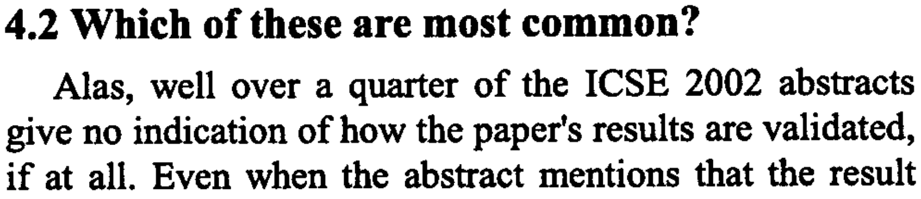
~~[1] has studied software design patterns~~

Odersky et al. have studied software design patterns [1].

Odersky et al. (2010) have studied software design patterns.

Paraphrasing

~~Over a quarter of the ICSE 2002 abstracts give no indication of how the paper's results are validated, if at all [1].~~



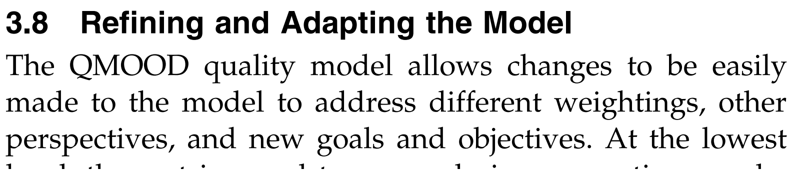
4.2 Which of these are most common?

Alas, well over a quarter of the ICSE 2002 abstracts give no indication of how the paper's results are validated, if at all. Even when the abstract mentions that the result

[1] M. Shaw. Writing good software engineering research papers: Minitutorial. In *Proceedings of the 25th International Conference on Software Engineering*, ICSE ’03, pages 726–736, Washington, DC, USA, 2003. IEEE Computer Society.

Citations

Bansiya and Davis claim that the QMOOD model may address ”different weightings, other perspectives, and new goals and objectives” [1]

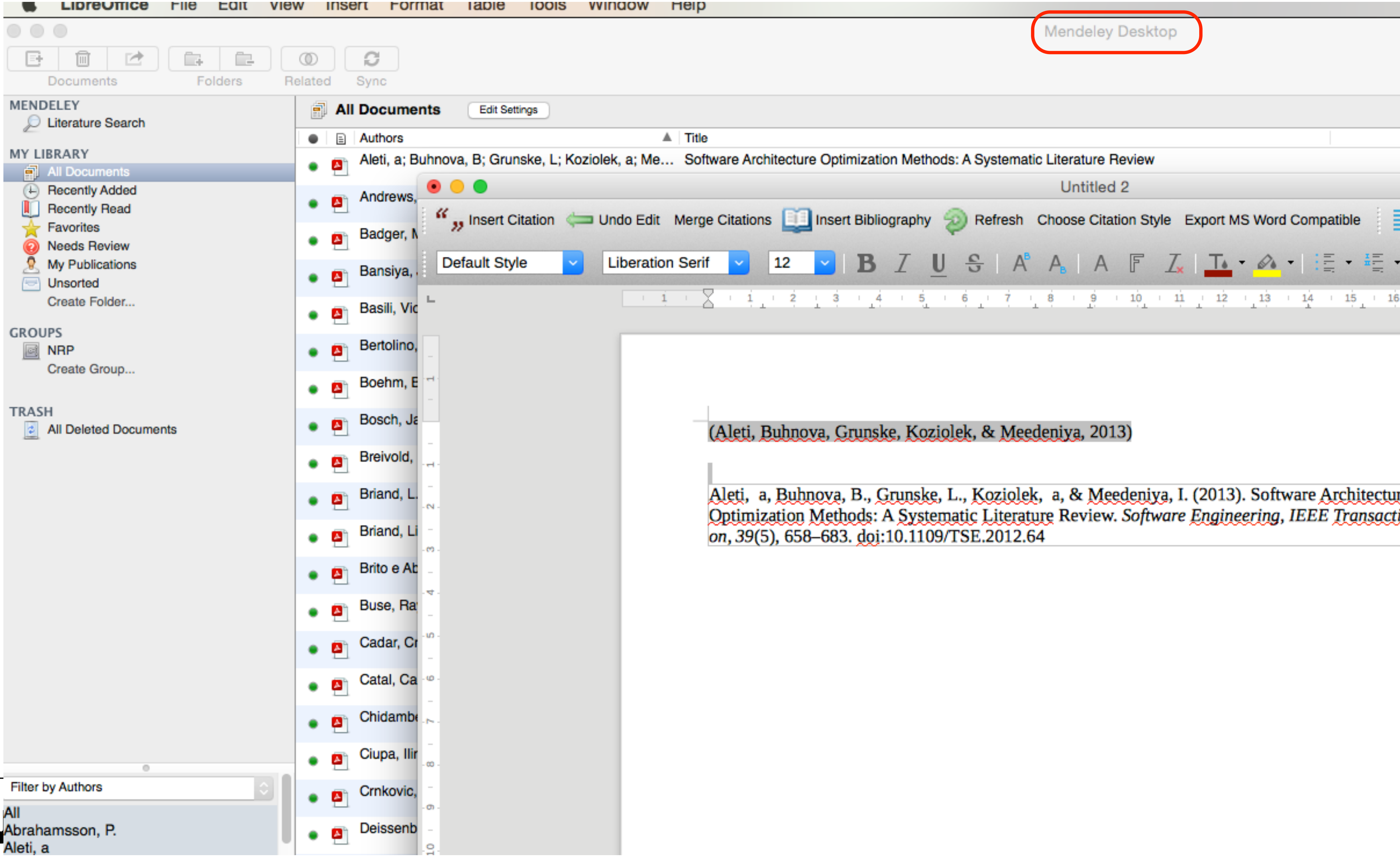


3.8 Refining and Adapting the Model

The QMOOD quality model allows changes to be easily made to the model to address different weightings, other perspectives, and new goals and objectives. At the lowest

[1] J. Bansiya and C. Davis. A hierarchical model for object-oriented design quality assessment. *IEEE Transactions on Software Engineering*, 28(1):4–17, Jan 2002.

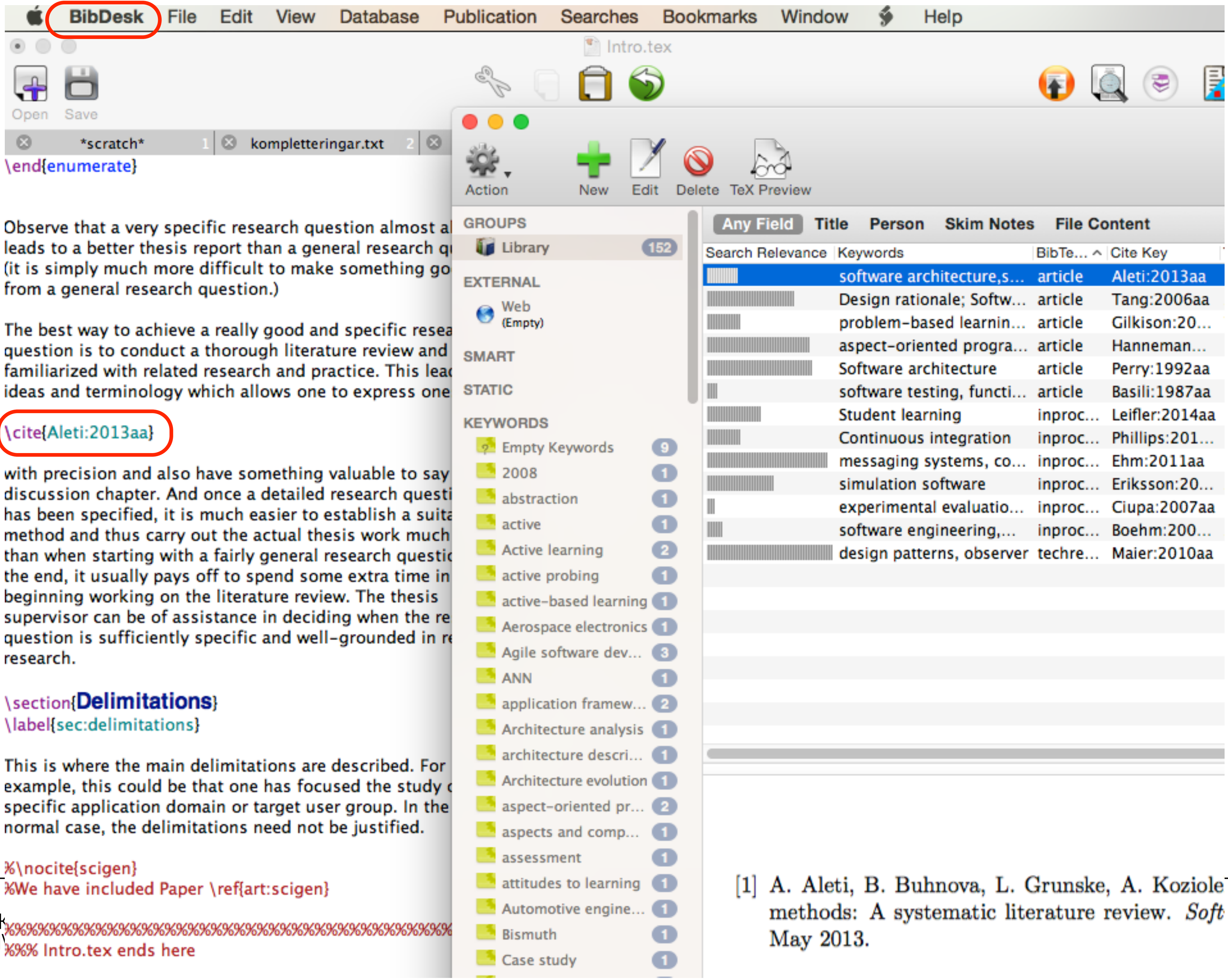
Managing references



Authors	Title
Aleti, a; Buhnova, B; Grunske, L; Koziolek, a; Me…	Software Architecture Optimization Methods: A Systematic Literature Review
Andrews,	
Badger, M	
Bansiya,	
Basili, Vic	
Bertolino,	
Boehm, E	
Bosch, Ja	
Breivold,	
Briand, L.	
Briand, Li	
Brito e Ab	
Buse, Ra	
Cadar, Cr	
Catal, Ca	
Chidamb	
Ciupa, Ilir	
Crnkovic,	
Deissenb	

(Aleti, Buhnova, Grunske, Koziolek, & Meedeniya, 2013)

Aleti, a, Buhnova, B., Grunske, L., Koziolek, a, & Meedeniya, I. (2013). Software Architectur Optimization Methods: A Systematic Literature Review. *Software Engineering, IEEE Transacti on*, *39*(5), 658–683. doi:10.1109/TSE.2012.64



\end{enumerate}

Observe that a very specific research question almost al
leads to a better thesis report than a general research q
(it is simply much more difficult to make something go
from a general research question.)

The best way to achieve a really good and specific resea
question is to conduct a thorough literature review and
familiarized with related research and practice. This lea
ideas and terminology which allows one to express one

\cite{Aleti:2013aa}

with precision and also have something valuable to say
discussion chapter. And once a detailed research questi
has been specified, it is much easier to establish a suita
method and thus carry out the actual thesis work much
than when starting with a fairly general research questio
the end, it usually pays off to spend some extra time in
beginning working on the literature review. The thesis
supervisor can be of assistance in deciding when the re
question is sufficiently specific and well-grounded in re
research.

\section{Delimitations}
\label{sec:delimitations}

This is where the main delimitations are described. For
example, this could be that one has focused the study o
specific application domain or target user group. In the
normal case, the delimitations need not be justified.

%\nocite{scigen}
%We have included Paper \ref{art:scigen}

%%%
%%% Intro.tex ends here

Keywords	Count
Empty Keywords	9
2008	1
abstraction	1
active	1
Active learning	2
active probing	1
active-based learning	1
Aerospace electronics	1
Agile software dev...	3
ANN	1
application framew...	2
Architecture analysis	1
architecture descri...	1
Architecture evolution	1
aspect-oriented pr...	2
aspects and comp...	1
assessment	1
attitudes to learning	1
Automotive engine...	1
Bismuth	1
Case study	1

Search Relevance	Keywords	BibTe...	Cite Key
	software architecture,s...	article	Aleti:2013aa
	Design rationale; Softw...	article	Tang:2006aa
	problem-based learnin...	article	Gilkison:20...
	aspect-oriented progra...	article	Hanneman...
	Software architecture	article	Perry:1992aa
	software testing, functi...	article	Basili:1987aa
	Student learning	inproc...	Leifler:2014aa
	Continuous integration	inproc...	Phillips:201...
	messaging systems, co...	inproc...	Ehm:2011aa
	simulation software	inproc...	Eriksson:20...
	experimental evaluatio...	inproc...	Ciupa:2007aa
	software engineering,...	inproc...	Boehm:200...
	design patterns, observer	techre...	Maier:2010aa

[1] A. Aleti, B. Buhnova, L. Grunske, A. Koziole
methods: A systematic literature review. *Soft*
May 2013.

Writing about what you've read

- Take notes of what you've read
- Consider what needs to be in your report. Do not write everything you've read in your report. Remember to have a strong connection to your main method/results

Summary

- Start learning about the subject, then find proper support for your claims. Use different sources for learning and as references to support specific claims.
- There are different types of academic publications and results. Use each type of publication as appropriate.
- Do not plagiarize or copy images or text.
- Use proper reference management software when writing your thesis.