Introduktion till vetenskaplig metodik

Johan Åberg

Innehåll

- Forskarvärlden
- Viktiga begrepp
- Referenshantering
- Den vetenskapliga rapporten
- Vetenskaplig diskussion

Forskarvärlden

- Forskare mäts i antal publikationer och antal citeringar
- Publikationer
  - Tidskrifter
  - Konferenser
  - Workshops
- Referee-granskning
- Olika publikationer har olika status

Call for papers (cfp)

ICSE 2014 Call for Papers – Research Papers

Goal and scope

ICSE is the premier forum for researchers to present and discuss the most recent innovations, trends, outcomes, experiences, and challenges in the field of software engineering.

We invite high quality submissions of research papers describing original and unpublished results, pertaining to all aspects of software engineering and particularly topics relevant to today's emerging practices and realities. We encourage all types of work, and especially encourage papers that assess the state of the art in the field, its research trajectory, and core assumptions that may or may not hold in the future.

ICSE is a selective conference, but welcomes innovative ideas that are well presented, timely, and have high likely impact, even if the findings are preliminary or not yet (fully) evaluated. Naturally, all submissions must position themselves within the existing literature, describe the relevance of the results to certain software engineering goals, and include a clear motivation and presentation of the work.

New this year

To guide the authors in preparing their submissions and to establish a consistent set of expectations in the review process, all authors are asked, as part of the online submission process, to self-identify their papers with one or more of the following categories:

- *Analytical*: A paper in which the main contribution relies on new algorithms or mathematical theory. Examples include new bug prediction techniques, model transformations, algorithms for dynamic and static analysis, and reliability analysis. Such a contribution must be evaluated with a convincing analysis of the algorithmic details, whether through a proof, complexity analysis, or run-time analysis, among others and depending on the objectives.
- *Empirical*: A paper in which the main contribution is the empirical study of a software engineering technology or phenomenon. This includes controlled experiments, case studies, and surveys of professionals reporting qualitative or quantitative data and analysis results. Such a contribution will be judged on its study design, appropriateness and correctness of its analysis, and threats to validity. Replications are welcome.
- *Technological*: A paper in which the main contribution is of a technical nature. This includes novel tools, modeling languages, infrastructures, and other technologies. Such a contribution does not necessarily need to be evaluated with humans. However, clear arguments, backed up by evidence as appropriate, must show how and why the technology is beneficial, whether it is in automating or supporting some user task, refining our modeling capabilities, improving some key system property, etc.
- *Methodological*: A paper in which the main contribution is a coherent system of broad principles and practices to interpret or solve a problem. This includes novel requirements elicitation methods, process models, design methods, development approaches, programming paradigms, and other methodologies. The authors should provide convincing arguments, with commensurate experiences, why a new method is needed and what the benefits of the proposed method are.
- *Perspectives*: A paper in which the main contribution is a novel perspective on the field as a whole, or part thereof. This includes assessments of the current state of the art and achievements, systematic literature reviews, framing of an important problem, forward-looking thought pieces, connections to other disciplines, and historical perspectives. Such a contribution must, in a highly convincing manner, clearly articulate the vision, novelty, and potential impact.

All papers are full papers, and papers may belong to more than one category. Note that papers from any research area can fall into any of these categories, as the categories are constructed surrounding methodological approaches, not research topics (e.g., one could write an analytical paper on a new analysis technique, an empirical paper that compares a broad range of such techniques, a technological paper that makes an analysis technique practically feasible and available, or a perspectives paper that reviews the state of the art and lays out a roadmap of analysis techniques for the future).

Evaluation

Submissions that are not in compliance with the required submission format or that are out of the scope of the conference will be rejected without reviewing.

Submitted papers must comply with ACM plagiarism policy and procedures. Papers submitted to ICSE 2014 must not have been published elsewhere and must not be under review or submitted for review elsewhere while under consideration for ICSE 2014.

All submissions that meet the criteria and fit the scope of the conference will be reviewed by at least two members of the Program Committee. Submissions will be evaluated on the basis of originality, evaluation, soundness, importance of contribution, quality of presentation, and appropriate comparison to related work.

ICSE this year will adopt a program board model in order to better process the increasing number of submissions that it has been receiving each year. The Program Board will work with the Program Committee to make the final decisions about which submissions are accepted for presentation at the conference. Detailed instructions have been provided to the Program Board and Program Committee: program board instructions and program committee instructions.

If you and your co-authors have not previously published a research paper at an ICSE conference, you may want to consider the ICSE 2014 mentoring program.

How to submit

All submitted papers must conform to the ICSE 2014 formatting and submission instructions, and must not exceed 10 pages for the main text, inclusive of figures, tables, appendices, etc. References may be included on up to two additional pages. All submissions must be in PDF.

Papers must be submitted through the CyberChair online submission system. Submissions that adhere to the submission and formatting instructions can be made using the CyberChair link provided here: ~~http://cyberchairpro.borbala.net/icsepapers/submit/~~. The deadline for this year's submission has passed.

Papers must be submitted electronically by the stated deadline. The deadline is firm and not negotiable.

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Computer Science Conference Rank

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Antonym	Name	Rank
AAAI	National Conference of the American Association for Artificial Intelligence	A*
AAMAS	International Conference on Autonomous Agents and Multiagent Systems	A*
ACL	Association of Computational Linguistics	A*
ACMMM	ACM Multimedia	A*
ASPLOS	Architectural Support for Programming Languages and Operating Systems	A*
CAV	Computer Aided Verification	A*
CCS	ACM Conference on Computer and Communications Security	A*
CHI	International Conference on Human Factors in Computing Systems	A*
COLT	Annual Conference on Computational Learning Theory	A*
CRYPTO	Advances in Cryptology	A*
CSCL	Computer Supported Collaborative Learning	A*
DCC	Data Compression Conference	A*
DSN	IEEE/IFIP International Conference on Dependable Systems	A*
EuroCrypt	International Conference on the Theory and Application of Cryptographic Techniques	A*
FOCS	IEEE Symposium on Foundations of Computer Science	A*
FOGA	Foundations of Genetic Algorithms	A*
HPCA	International Symposium on High Performance Computer Architecture	A*
I3DG	ACM SIGRAPH Interactive 3D Graphics	A*
ICCV	IEEE International Conference on Computer Vision	A*
ICDE	International Conference on Data Engineering	A*
ICDM	IEEE International Conference on Data Mining	A*
ICFP	International Conference on Functional Programming	A*
ICIS	International Conference on Information Systems	A*
ICML	International Conference on Machine Learning	A*
ICSE	International Conference on Software Engineering	A*
IJCAI	International Joint Conference on Artificial Intelligence	A*
IJCAR	International Joint Conference on Automated Reasoning	A*
ISCA	ACM International Symposium on Computer Architecture	A*
ISMAR	IEEE/ACM International Symposium on Mixed and Augmented Reality	A*
ISSAC	International Symposium on Symbolic and Algebraic Computation	A*
ISWC	IEEE International Symposium on Wearable Computing	A*

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D Posnett, R D'Souza, P Devanbu... - ... (ICSE), 2013 35th ..., 2013 - ieeexplore.ieee.org

Abstract—Work practices vary among software developers. Some are highly focused on a few artifacts; others make wideranging contributions. Similarly, some artifacts are mostly authored, or "owned", by one or few developers; others have very wide ownership. Focus ...

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A Capiluppi, A Serebrenik... - ... Repositories (MSR), 2012 ..., 2012 - ieeexplore.ieee.org

(OSS) repositories has been used for many practical reasons: detecting community structures; identifying key roles among developers; understanding software quality; predicting the arousal of bugs in large OSS systems, and so on; but also to formulate and ...

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Who? where? what? examining distributed development in two large open source projects

C Bird, N Nagappan - ...), 2012 9th IEEE Working Conference on, 2012 - ieeexplore.ieee.org

Abstract—To date, a large body of knowledge has been built up around understanding open source software development. However, there is limited research on examining levels of geographic and organizational distribution within open source software projects, despite ...

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Triaging incoming change requests: Bug or commit history, or code authorship?

M Linares-Vásquez, K Hossen, H Dang... - ... (ICSM), 2012 28th ..., 2012 - ieeexplore.ieee.org

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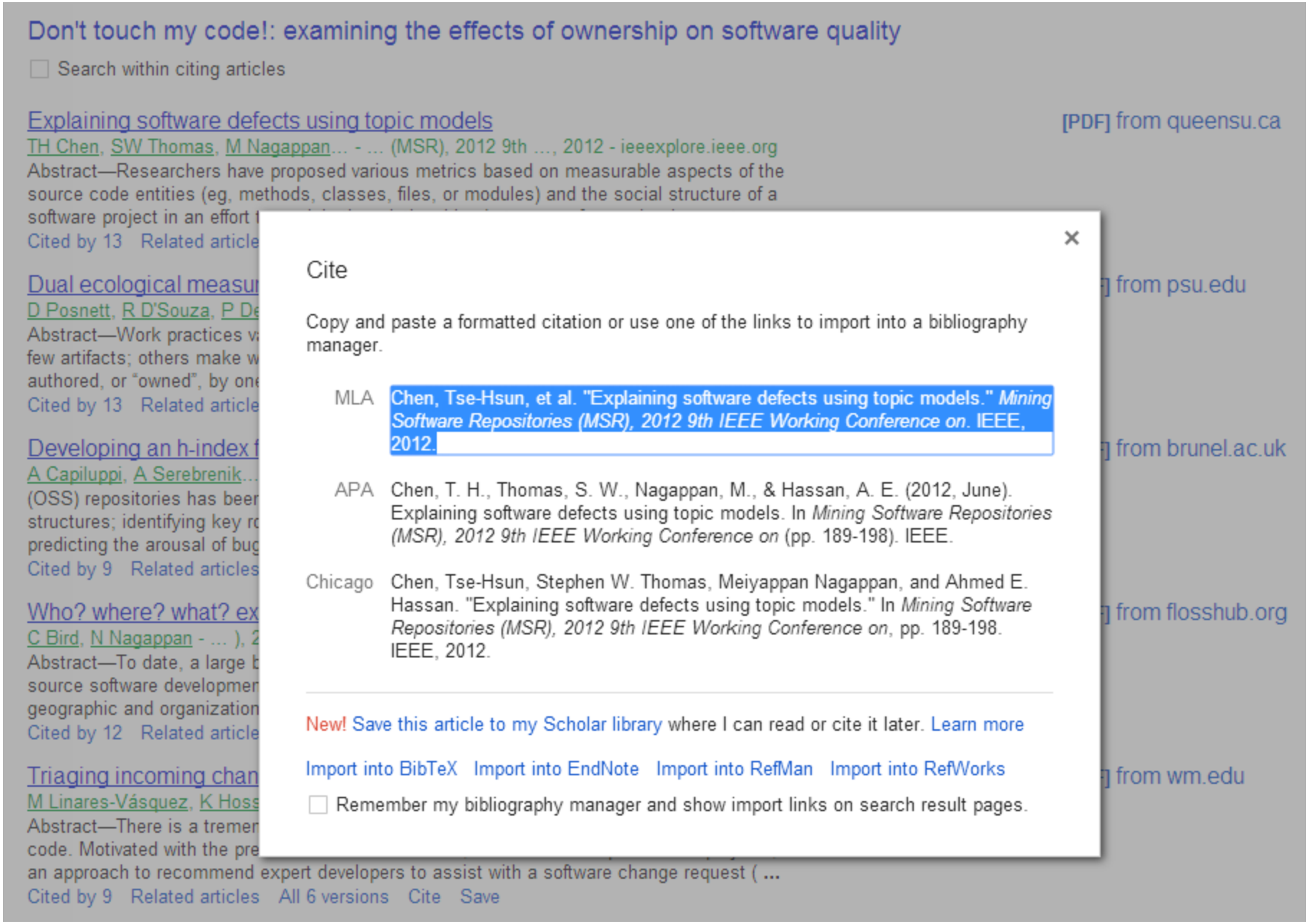
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APA Chen, T. H., Thomas, S. W., Nagappan, M., & Hassan, A. E. (2012, June). Explaining software defects using topic models. In Mining Software Repositories (MSR), 2012 9th IEEE Working Conference on (pp. 189-198). IEEE.
Chicago Chen, Tse-Hsun, Stephen W. Thomas, Meiyappan Nagappan, and Ahmed E. Hassan. "Explaining software defects using topic models." In Mining Software Repositories (MSR), 2012 9th IEEE Working Conference on, pp. 189-198. IEEE, 2012.
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Vetenskapliga kvalitetsbegrepp

- Validitet
  - Mäter man det man vill mäta?
- Reliabilitet
  - Tillförlitlighet
    - skulle man få samma resultat om man mätte igen, oberoende av vem som skötte mätningen?
- Replikerbarhet
  - Är en studie så väl beskriven och någon kan göra om samma studie?

Metodperspektiv

- Kvalitativ
  - Kvalitativ data
    - Tal, text
  - Fokus
    - Förstå, se olika perspektiv
  - Datainsamling
    - Intervju
    - Fritextsvar i enkät
  - Analys
    - Kategoriseringsmetoder, …
- Kvantitativ
  - Kvantitativ data
    - Siffror
  - Fokus
    - Kvantifiera, jämföra
  - Datainsamling
    - Mätning med instrument
    - Flervalsalternativ
  - Analys
    - Statistiska metoder

Referenshantering

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- Konferens
  - Plonka, L., Sharp, H., & van der Linden, J. (2012). Disengagement in pair programming: does it matter? In *Proceedings of the 34th International Conference on Software Engineering (ICSE),* pp. 496-506. IEEE.
- Workshop
  - Samma som för konferens
- Avhandling/uppsats
  - Furulund, M.K. (2007). *Empirical Research on Software Effort Estimation Accuracy*, Master Thesis, Department of Informatics, University of Oslo.
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Den vetenskapliga rapporten

- Abstract
  - Kort och koncist, inklusive resultat och slutsatser
- Inledning
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  - Tydliga frågeställningar
- Teori
  - Beskriv relaterad forskning
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- Metod
  - Detaljerad beskrivning av studien
    - tänk på replikerbarhet
  - Datainsamling och analys
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  - Presentera resultatet
  - Sakligt, utan analys eller kommentar
- Diskussion
  - Hur kan resultaten tolkas?
  - Koppling till relaterad forskning (teorikapitlet)?
  - Metodmässiga risker eller begränsningar?
- Slutsatser
  - Återkoppla till forskningsfrågorna
  - Vad blev svaret?
- Referenser
  - Lista källorna enligt passande format

Vetenskaplig diskussion

- Liknande resultat
  - “The strong tendency of navigators to suggest specifications (i.e., what to click or scroll) to the driver is a testament to how closely partners worked together. Chong et al. [7] also observed pairs (professionals) working very closely together—so close that the partners were practically finishing each other’s sentences. Similar to the Chong pairs, our navigators were so engaged in the task and in tune with the context that they made most of their suggestions at the level of what to click next, rather than higher level strategies.”
- Skilda resultat
  - “Our navigators’ strong tendency to offer ideas for specific actions contrasts with prior findings about the level of abstraction of navigator discourse. In particular, Bryant et al. [5] studied the utterances of professional pairs and coded them based on five levels of abstraction (from lowest to highest). Their study found that navigator discourse was predominantly at a moderate level of abstraction, in which the program was discussed in terms of logical chunks and strategies. However, our navigators’ specific-action suggestions were at a lower level of abstraction than logical chunks and strategies.”

Exempel från artikeln: Jones, D.L., and Fleming, S.D. What use is a backseat driver? A qualitative investigation of pair programming. In *Proceedings of the IEEE Symposium on Visual Languages and Human-Centric Computing*, pp. 103-110, 15-19 September, 2013.

- Varför skilda resultat?
  - “This difference may be because we looked only at utterances in which navigators offered ideas, but it may also be because of differences between the Bryant pairs and ours. For example, our pairs may have worked more closely together than the Bryant professional programmers. A study of professional pairs by Plonka et al. [23] found that their navigators often had reason to disengage from the driver’s activity, for example, because of interruptions or because they divided up work to be done in parallel with the driver. Our navigators generally did not exhibit such disengagement behavior.”

- Alternativ förklaring
  - “The difference may also be because the Bryant pairs were professionals who had been pair programming for over 6 months. Thus, their pairs were likely already jelled, and as such, had developed their pair communication such that they could converse using higher levels of abstraction. In contrast, our pairs may not have developed the common vernacular necessary for easy communication at higher levels of abstraction.”

Exempel från artikeln: Jones, D.L., and Fleming, S.D. What use is a backseat driver? A qualitative investigation of pair programming. In *Proceedings of the IEEE Symposium on Visual Languages and Human-Centric Computing*, pp. 103-110, 15-19 September, 2013.