Software Development and Evolution

Seminar in Advanced Software Engineering, FS 2014

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Organizational Announcements

- 3rd year and up (prerequisite: Software Engineering)
- Language for report and presentation is English
- Work independently
- Don't forget to do the "Modulbuchung"!

Seminar Goals

- Introduce you to a part of research in software engineering
- Improve your ability to critically read and analyze scientific papers
- Strengthen your technical writing and your presentation skills
- Improve your ability to ask and answer critical questions

What you have to do

- Do a literature review for an assigned topic (at least 10 relevant articles)
- Write a report and refine it (12 to 15 pages, LNCS format)
- Review two reports
- Present your findings (approx. 15mins + 10mins questions)
- Actively participate in discussions

3 credits / 90 hours: approx. 70 report & review, 20 presentation

Software Development and Evolution - Topics

- Supporting Crosscutting Concerns
- Code Recommendation
- Concept Location and Code Search
- Tool Support for Tasks/Bugs
- Software Quality Tools
- Refactoring
- Software Architecture
- APIs
- Human Aspects in Software Development

Topic – Supporting Crosscutting Concerns

Aspect-Oriented Programming.

 N degrees of separation: multi-dimensional separation of concerns.

 Concern graphs: finding and describing concerns using structural program dependencies.

Topic – Code Recommendation

 Using structural context to recommend source code examples.

Mining version histories to guide software changes.

Topic - Concept Location and Code Search

 Feature identification: where in the code is this feature implemented.

 Where should the bugs be fixed? Using information retrieval and more to localize bugs.

Topic – Tool Support for Tasks/Bugs

Using task context to improve programmer productivity.

Who should fix this bug?

 Summarizing software artifacts: a case study of bug reports.

Topic – Software Quality Tools

Yesterday my program worked today it does not. Why?

 Change analysis with Evolizer and ChangeDistiller.

 Tools for continuously evaluating distributedsystem qualities.

Topic – Refactoring

A survey of software refactoring.

How we refactor and how we know it.

Automated testing of refactoring engines.

Topic – Software Architecture

 Using software evolution to focus architectural recovery.

- ArchJava: connecting software architecture to implementation.
- Software Reflexion Models: bridging the gap between source and high-level models.

Topic – APIs

What makes APIs hard to learn? Answers from developers.

How to design a good API and why it matters.

Topic – Human Aspects in Software Development

- Using fMRI (functional magnetic resonance imaging) to examine program comprehension
- Using eye-tracking for characterizing program comprehension

Finding Relevant Work

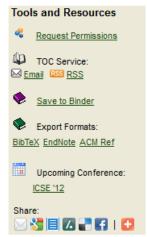
- search online by author, keyword, topic, etc. on personal web sites, Google Scholar, ACM Digital library, Citeseer, IEEE Digital Library
- Look through proceedings of main conferences (ICSE, FSE, ESEM, ICGSE, ICPC, CSCW)
- Browse and follow references/citations in relevant papers and read related work sections
- If you found a relevant and older paper, look for papers it is "cited by"



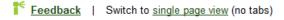
Consortium of the Swiss Academic Libraries Universität Zürich







Tags: bubbles concurrent
views debugging human factors
human factors integrated
development environments
integrated environments navigation
source code working set





Reading a Research Paper

- Read *critically*: be suspicious and ask appropriate questions:
 - e.g. are the authors solving the right problem, what are the limitations, are the assumptions reasonable
- Read *creatively*: critical is easy, reading creatively is harder:
 - e.g. what are the good ideas, how would you extend it, are there applications or extensions the authors haven't thought of
- Make *notes*!
- After reading, try to *summarize* the paper
- Compare to other works

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Expectations to Report

- Summarize current state of the art
- Provide a good overview of the area
- Present main research questions, concepts, ideas and approaches in the area as well as open challenges
- Find commonalities, specialties, differences,...
- Critical and creative thinking, some reflection on your own
- Wikipedia is not an option!

Expectations to Report (2)

- Find good structure / outline / categorization and present in a coherent and consistent way Abstract, Introduction, Related Work, Discussion, Conclusion, References, Word of Honor
- Use correct and understandable English, presentation is very important (proof-read?)
- Phrases such as "I like this paper" should not be in it
- Cite and quote correctly to avoid plagiarism!
- Higher for master than for bachelor students

Word of Honor

At the end of your report, include a note on a separate page which you sign, stating:

I, [first and last name], hereby declare that I have produced this work independently and have used no other than the listed tools and sources

- This does not count towards the 12-15 pages
- Only required for the final report!

Review a Report

- Start with a brief summary of the report (2-3 sentences)
- Technical quality, originality/novelty and significance: are the arguments in the paper correct, how original/novel is the report, how significant is the research question the author poses, is the research area well covered, what is good about the report, are there any problems/issues, what could the author improve
- Logical structure, presentation and style:
 is the paper coherent, well-written and are concepts and
 approaches well-explained, are graphics/tables used appropriately,
 is it easy to follow and clear, how could it be improved
- Be constructive, polite and professional!
- Start with summary, pros/cons and go from high granularity to lower

Review a Report

- You will receive a review form through EasyChair
- Provide your review and a grade on a scale from 0 to 6 (minimum increments of 0.25)
 - 5 6: An excellent work.
 - 4 5: A good work with just a couple of small weaknesses.
 - 3 4: An average work with clear weaknesses.
 - 0 3: Insufficient work with many substantial weaknesses.

Presentation (15 mins)

- Several guidelines on website
- Some more:
 - Don't exceed the time limit!!!
 - Practice the talk
 - Don't ignore the audience
 - Avoid too many slides, too many bullets, fonts too small, too much text
 - Have a flow
 - Motivate topic, explain concepts, provide overview,...
- Scientifically Speaking:

http://www.erp.wisc.edu/profdev/Scientifically_speaking.pdf

Deadlines

- Mar 6th Email with 3 preferences to me (latest)
- Mar 7th Topic assignment
- Apr 6th Report submission (midnight hard deadline)
- Apr 16th Review period end
- Apr 17th Notification
- Apr 27th Corrected report submission
- May 9th Presentation Day (9am, mandatory)

More Information

 See website: <u>http://www.ifi.uzh.ch/seal/teaching/courses/seminar.html</u>
 (also includes presentation guidelines)

Contact:

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BSc and MSc Project...

- Answering developers questions
- Biometric Sensors in SE
- Personal Analytics

...contact me if you are interested