Software Development and Evolution

Seminar in Advanced Software Engineering, FS 2018

Sebastian Proksch, Thomas Fritz & Harald Gall
This course is about…

- Research in software engineering (SE)

By the end you should

- have an understanding of SE research
- be able to find, review, assess, discuss and categorize relevant related work
- be able to write a technical report on the state of the art in an area of SE and present it
This term

- Team
  - Sebastian Proksch (proksch@ifi.uzh.ch)
  - Thomas Fritz (fritz@ifi.uzh.ch)

www.ifi.uzh.ch/en/seal/teaching/courses/semase.html
(also includes presentation guidelines, examples of response papers and reports, etc.)
About me

- Associate Professor, UZH (previously UBC/UZH)
  - research area in software engineering, particularly
    - developer productivity
    - Biometric sensing
    - Information needs
  - Research with multiple companies: ABB, Microsoft, IBM, iQmetrix, adesso, Bison, …

- PhD at UBC in 2011, Diplom at LMU (Munich) and EMN (Nantes)
FlowLight – one of our projects

Light status based on user computer interaction (available, busy, do not disturb)
FlowLight – one of our projects

449 participants from 12 countries

- 183 survey responses, 23 in-depth interviews,
- 36 self-reported interruption logs

49% less interruptions per person per day

> 75% of users continue using it on a daily basis
BSc and MSc Thesis & Project…

- Biometric Sensing in SE
- Personal Analytics
- Developers’ Information Needs
- …

…contact us if you are interested
Introduce yourself!

What’s your name?
What is your degree and specialization?
What are you interested in (in general/in SE/for this course/..)?
Administrativa,
Structure and more
Organizational Announcements

- 3rd year and up
  - for bachelor and master students
  - prerequisite: Software Engineering

- Language for report and presentation is English

- Work independently (no group work)

- Don’t forget to register for the module ("Modulbuchung")
Seminar Structure

Two parts (after today):

- Part 1: 3 weeks
- Part 2: 10 weeks

Today: kick-off

- Part 1: Group discussions of topics 1-6
- Part 2: Literature report on one of the topics, reviews, and presentation
Seminar Structure: Part 1

- First three weeks: Group discussions in class (topic 1-6, 2 topics per week, attendance mandatory)

- Read the main paper per topic & find a third one (e.g. for Feb 27th: main paper of topic 1, main paper of topic 2)

- Write a short response paper (on the three papers, less than 1 page long)

- Discussion of topics in class (actively participate in the discussions!)

3 credits (→ 90 hours): 1/3 for part 1 (~30 hours)
Seminar Structure: Part 2

- Perform literature review for an assigned topic
  (at least 7-11 relevant articles)

- Write a report and refine it
  (9 to 12 pages, “Lecture Notes in Computer Science”-format)

- Review two reports

- Present your findings
  (approx. 15 minutes and 10 minutes questions)

- Actively participate in discussions

3 credits (→ 90 hours): 2/3 for part 2 (~60 hours)
Grading

- 3 response papers, class participation [20%]
- Reviews of other reports [10%]
- Written report [50%]
- Presentation [20%]
Topics

1. Sensing Developers
2. Testing
3. Recommendation Systems for Software Engineering
4. Source-Code Evolution
5. Continuous Integration
6. Development Work in Practice
1. Sensing Developers

- Better understanding the developer in the process and her/his experiences
- Better understanding code comprehension
2. Testing

- Test coverage and effectiveness
- The right tests
3. Recommendation Systems

- Meet the information need of developers
- Offer the right support at the right time
4. Source-Code Evolution

- Source-Code is the central artifact of software engineering. Improve future systems by studying the evolution of old systems.

- How to make sense of the vast amount of data?
5. Continuous Integration

- Agile development and continuous integration are best practices in modern SE.

- What are their benefits and drawbacks?

- How is CI used in practice?
6. Development in Practice

- In practice, development work is highly fragmented.

- How bad is the situation in practice?

- Not all activity switches seem to be equally ‘expensive’.
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, CHI, ASE, MSR, ICPC, ICSME)

- 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”
Code bubbles: rethinking the user interface paradigm of integrated development environments

Authors: Andrew Bragdon, Brown University
Steven P. Reiss, Brown University
Robert Zeleznik, Brown University
Suman Karumuri, Brown University
William Cheung, Brown University
Joshua Kaplan, Brown University
Christopher Coleman, Brown University
Ferdi Adeputra, Brown University
Joseph J. LaViola, Jr., University of Central Florida

Published in:
Proceedings of the 32nd ACM/IEEE International Conference on Software Engineering - Volume 1
ACM New York, NY, USA ©2010

Bibliometrics
- Downloads (6 Weeks): 13
- Downloads (12 Months): 258
- Citation Count: 11

Tools and Resources
- Request Permissions
- TCC Service
- Email
- Save to Binder
- Export Formats: BibTeX EndNote ACM Ref

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

Feedback | Switch to single page view (no tabs)
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

Response Papers

- Encouragement to **read and reflect**
  Class discussions work better if everyone has read and thought about the paper

- **NOT a summary.** Think of it this way
  - If I asked you what you thought about a movie you recently went to, you wouldn’t just summarize it
  - Grading based on “thoughtfulness”

- Find one more suitable paper

- Due by **midnight** on Sunday before class
Response Papers

- Questions of interest
  - What did you think about it and what did you find important or interesting?
  - What are main contributions of the paper?
  - What are strengths or weaknesses of the paper/research?
  - What are five questions you have about it?
  - What could be improved?
  - How could you imagine extending the work?
  - Do you agree or disagree with the findings?
  - …

- Express your perspective, *address all readings* and *draw connections between readings* when possible
- Example provided on web site
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 expectations for master than for bachelor stud.

Find more details at (Sven Seuken):
http://www.ifi.uzh.ch/ce/teaching/fall2013/seminar/seminar_guideline.pdf
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 9-12 pages
- Only required in 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 from the following options:
  accept
  weak accept
  weak reject
  reject

- Examples of good reviews are on the course website
Presentation (15 mins)

- Several guidelines on website
- Some more:
  - Don’t exceed the time limit
  - Practice the talk
  - Check your presentation with the beamer
  - Don’t ignore the audience
  - Avoid too many slides, too many bullets, fonts too small, too much text
  - Have a flow / story line
  - Motivate topic, explain concepts, provide overview,…
# Deadlines

<table>
<thead>
<tr>
<th>Date and Time</th>
<th>Topic / Deliverable</th>
</tr>
</thead>
<tbody>
<tr>
<td>19.02.</td>
<td>Kick-off meeting</td>
</tr>
<tr>
<td>22.02., 11:59pm</td>
<td>Send your three topic preferences for the report by email</td>
</tr>
<tr>
<td>23.02.</td>
<td>Topic assignment</td>
</tr>
<tr>
<td>25.02., 11:59pm</td>
<td>Response paper for topic 1 &amp; 2 due by email</td>
</tr>
<tr>
<td>26.02.</td>
<td>Mandatory class discussion (Topic 1 &amp; 2)</td>
</tr>
<tr>
<td>04.03., 11:59pm</td>
<td>Response paper for topic 3 &amp; 4 due by email</td>
</tr>
<tr>
<td>05.03.</td>
<td>Mandatory class discussion (Topic 3 &amp; 4)</td>
</tr>
<tr>
<td>11.03., 11:59pm</td>
<td>Response paper for topic 5 &amp; 6 due by email</td>
</tr>
<tr>
<td>12.03.</td>
<td>Mandatory class discussion (Topic 5 &amp; 6)</td>
</tr>
<tr>
<td>01.04., 11:59pm</td>
<td>Submit a list of selected research articles for the report and a rough outline/structure</td>
</tr>
<tr>
<td>02.04. - 06.04.</td>
<td>Mandatory meeting for early feedback on your reports (You are responsible to arrange a meeting date in advance!)</td>
</tr>
<tr>
<td>01.05., 11:59pm</td>
<td>Submit report for review</td>
</tr>
<tr>
<td>03.05.</td>
<td>Reviews start</td>
</tr>
<tr>
<td>10.05., 11:59pm</td>
<td>All Reviews Due</td>
</tr>
<tr>
<td>11.05.</td>
<td>Author Notification</td>
</tr>
<tr>
<td>22.05., 11:59pm</td>
<td>Submit revised report</td>
</tr>
<tr>
<td>29.05.</td>
<td>Mandatory presentation day (date, time, and schedule depends on the number of participants and will be announced).</td>
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Frequently check the course page for updates!
Details & More Information

  (also includes presentation guidelines, examples of response papers and reports, etc.)

- **Contact:**
  
  Sebastian Proksch  proksch@ifi.uzh.ch
  Thomas Fritz       fritz@ifi.uzh.ch