MTAT.03.270
Seminar on Enterprise Software
(3 ECTS)

Dietmar Pfahl
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Purpose of MSc Degree

• Advance career in industry
  • Prepare for technical leadership positions
  • Prepare for management positions

• Prepare for career in academia
  • Prerequisite for doing a PhD

Context

Core Module (4 courses, 24 ECTS)

Masters Seminar & Thesis (36 ECTS)

Professional Practice or Projects (18 ECTS)

Electives & Free-Choice Courses (18 ECTS)

Specialty Module 1: Enterprise Software (24 ECTS)

Specialty Module 2: Embedded Software (24 ECTS)

MSc Seminar 1 + 2 (3 + 3 ECTS)

Context

• Target Group of MSc Seminar 1 (MTAT.03.270 or ITX8301)
  • 1st year students in the MSc Software Engineering (SE) program
  • This seminar is mandatory for all students in the MSc SE program
  • This seminar is equivalent to the Master’s Seminar 1 taught at TalTech - the spring seminars are mutually exclusive (must take either UT or TalTech seminar)

• In the fall semester you are supposed to take the second seminar
  • You should by then have a MSc thesis topic
  • Fall seminar should be taken in the Chair where the master thesis supervisor is located; if it is the Chair of SE & IS, take ‘Research Seminar in Software Engineering’ (LTAT.05.023)
Seminar Goal

To help you deliver a high-quality master thesis on time
• Target: Defence in June 2022 (current 1st year students)

• In this seminar: Focus on Literature Review
Seminar Communication

• Use Slack

se-seminar2021spring.slack.com
Seminar Delivery

• Via Zoom or BBB

Links in Moodle
Submission of Tasks

• Via Course Wiki

https://courses.cs.ut.ee/2021/enterprise/spring/Main/HomePage
Background: MSc Thesis Template


- The typical structure of a thesis consists of the following components:
  - Title page
  - Information sheet
  - Table of Contents
  - Introduction
  - Terms and notions (optional)
  - Chapters
  - Summary
  - References
  - Appendices (if relevant)
  - License
Background: MSc Thesis Template

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<tr>
<td>Results</td>
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<td>Discussion</td>
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Background: Types of Theses


• Theoretical Study
  • Independent Study
  • Review-type Study

• Applied Research
  • Thesis based on a software solution created by the author
  • Hardware or software testing
  • Thesis based on study aid or learning material compiled by the author
Types of Theses – Theoretical


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More relevant for theoretical informatics
In SE/IS: Modeling, Algorithms, ??
Background: Types of Theses – Theoretical

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(Systematic) Literature Review
Mapping Study (=light-weight SLR)
Survey Study (questionnaires/interviews)
Background: Types of Theses – Applied


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*Design Science / Engineering / Case Study / Action Research*
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Evaluation / Quality Assessment (Test & Static Analysis)
(and Process Assessment/Evaluation)
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Didactics / Evaluation based on Student Feedback
Goal Setting

• It is important to have one (or more) goal(s) set out at the beginning of the thesis
  • Question to ask yourself: What will you have achieved when you submit?

• There are many types of goals (see next slide)
  • Type of goal depends on type of thesis and problem statement
  • Goals might be formulated as Research Questions (RQs)
Types of RQs

- Exploratory Question
  - Existence Question
  - Description and Classification Question
  - Descriptive Comparative Question
  - Frequency and Distribution Question
  - Simple Causality Question
  - Causality-Comparative Question
  - Causality-Comparative Interaction Question

- Design Question
  - Base-Rate Question
  - Descriptive-Process Question
  - Relationship Question
  - Simple Causality Question
  - Causality-Comparative Question
  - Causality-Comparative Interaction Question

- Knowledge Question
  - Descriptive Comparative Question
  - Relationship Question
  - Simple Causality Question
  - Causality-Comparative Question
  - Causality-Comparative Interaction Question

Example: Design Questions

-> "What is an effective way to achieve X?" / What strategies help to achieve X?"

Examples:

What is an effective way for teams to capture requirements in order to improve communication with customers?

or

What is an effective way for architects to represent design knowledge in order to improve design quality?
Come, I will show you something interesting ...

I don’t have time, I have to work!
Related Work

• It is important to know what knowledge about your topic and goal already exists
  • To not re-invent the wheel / To not miss out on good ideas
  • Methods: Systematic Literature Survey / Systematic Mapping Study
Literature Review Methods

• **Systematic Literature Survey:**

• **Mapping Study:**

• **More materials on research methods in SE**
  • See course wiki (Sessions & Deadlines):
    [https://courses.cs.ut.ee/2021/enterprise/spring/Main/HomePage](https://courses.cs.ut.ee/2021/enterprise/spring/Main/HomePage)
Schedule – sessions in red are mandatory

• 10 February - Introductory Session 1 (Dietmar Pfahl)
• 17 February - Introductory Session 2 (Dietmar Pfahl)
• 3 March - Individual Consultation for 2nd year students (optional & on request by student only - first come first serve)
• 10 March - Presentations 1: 2nd year students only
• 17 March - Presentations 2: 2nd year students only
• 24 March - Individual Consultation for 1st year students (optional & on request by student only - first come first serve)
• 31 March - Presentations 3: 1st year students only
• 7 April - Presentations 4: 1st year students only
• 14 April - Presentations 5: 1st year students only
• 21 April - Presentations 6: 1st year students only
• 28 April - Presentations 7: 1st year students only
• May 5 & 12 – Presentation 8 & 9: 1st year students only
  • only if needed / otherwise individual consultation for final reports (optional & on request by student only - first come first serve principle)

Zoom Link in Moodle
Milestones / Deadlines

- 1 March - Deadline for identifying topic with RQs
- 8 March - Deadline for submitting draft reports & slides of Presentations 1
- 15 March - Deadline for submitting draft reports & slides of Presentations 2
- 29 March - Deadline for submitting draft reports & slides of Presentations 3
- 5 April - Deadline for submitting draft reports & slides of Presentations 4
- 12 April - Deadline for submitting draft reports & slides of Presentations 5
- 19 April - Deadline for submitting draft reports & slides of Presentations 6
- 26 April - Deadline for submitting draft reports & slides of Presentations 7
- 15 May - Deadline for submitting final reports (2nd year students)
- 22 May - Deadline for submitting final reports (1st year students)

Use submit link on course wiki
Submit before 23:59
No extensions will be given
Tasks

• Draft Report + Presentation Slides
• Final Report
• Feedback on presentations (via Quiz in Moodle) – at least 5 sessions

• Submission formats:
  • Report: ACM template (3-4 pages) – structure follows examples (course wiki) – more details next week
    • Submit PDF via course wiki
  • Presentation slides: must fit in 12 min
    • Submit PDF (and Powerpoint if animations make PDF unreadable) via course wiki

For reports and presentations:
2nd year students work individually
1st year students work in pairs
Feedback is given individually
Assessment and Grading

• This seminar is a "pass/fail" course

• Assessment criteria of the seminar
  • Presence during mandatory sessions (if online session, then video must be switched on)
  • Punctual submission of information / documents
  • Quality of draft/final report -> must be above minimum threshold
  • Quality of presentation (incl. slides) -> must be above minimum threshold
  • Participation in at least 80% of the mandatory quizzes (conducted in Moodle at end of presentation session)
    • With 7 presentation slots in total, this means 6 presentation slots are mandatory for giving feedback => to be above of 80% of 6 one must give feedback on 5 presentation slots
    • Use scoring rubric on next slide for justification of best/worst presentation
Assessment and Grading (cont’d)

How to definitely fail the course?

• Not being present in **all** mandatory sessions (without sufficient justification; sufficient justification is a certificate from a medical doctor saying that you cannot do home office).

• Missing a milestones by more than 24 hours - no exceptions will be granted!

• Not submitting **all** requested information items and documents (topics, supervisors, reports, slides, feedback).

• Not giving a presentation

• Not giving feedback to at least 5 presentation sessions

• Having a grade below the threshold in the draft/final report or the presentation
Assessment Criteria

Report (draft & final)
• Form (format, language)
• Content
  • Quality (depth, correctness, completeness -> all steps of the review process correctly conducted; relevance of literature found and analysed)
  • Quantity (amount of questions investigated, amount of literature analysed)

Presentation
• Form (format, language, slides not too full, types not too small)
• Timing (no overrun, time fully used – 12 min)
• Content (logical flow, focus on important messages, consistent with report)
• Attitude (speed of talking, voice)
Topics + Research Questions (RQs)

• 2nd year students:
  • Use their actual MSc topic

• 1st year students:
  • Pick from list on course wiki
  • Refine according to interest
  • Inform teacher (me) via Slack (first-come-first-serve principle)
SLS – Main Steps

Based on:


SMS – Main Steps

1. Research Questions
2. Data Search (Database, Manual, Snowballing)
3. Study Selection and Quality Assessment
4. Data Extraction
5. Analysis and Classification

Based on:
### Difference SLS vs. SMS

<table>
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<tr>
<th>Features</th>
<th>SLR</th>
<th>SM</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Focus of the review</strong></td>
<td>– Identify, analyze and interpret all available evidence related to a specific RQ</td>
<td>– Identify and classify what evidence is available (broad review) in a specific topic of area</td>
</tr>
<tr>
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<td>– Identify best practices based on empirical evidence</td>
<td>– Establish the state of evidence</td>
</tr>
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<td><strong>Research Questions</strong></td>
<td>– Narrow RQs</td>
<td>– Broader RQs</td>
</tr>
<tr>
<td></td>
<td>– Specific RQs</td>
<td>– Multiple RQs</td>
</tr>
<tr>
<td></td>
<td>– Consider population; intervention; comparison and outcomes (PICO)</td>
<td>– Consider only population and intervention</td>
</tr>
<tr>
<td><strong>Methods for searching</strong></td>
<td>– Search string highly focused</td>
<td>– Search string less highly focused</td>
</tr>
<tr>
<td><strong>Methods for selecting</strong></td>
<td>– Generally few studies are considered</td>
<td>– A large number of studies are considered (broad coverage)</td>
</tr>
<tr>
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<td>– The studies are evaluated in details</td>
<td>– The studies are not evaluated in details</td>
</tr>
<tr>
<td><strong>Methods for data extraction</strong></td>
<td>– The primary studies are assessed regarding their quality (the main goal is to establish the state of evidence)</td>
<td>– The primary studies are not assessed regarding their quality</td>
</tr>
<tr>
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<td>– Include data extraction procedures</td>
<td>– Much broader (classification and categorization stage)</td>
</tr>
<tr>
<td></td>
<td>– It is a time-consuming task</td>
<td>– It is not a time-consuming task</td>
</tr>
<tr>
<td><strong>Synthesis</strong></td>
<td>– Include depth analysis techniques, e.g., meta-analysis and narrative synthesis</td>
<td>– Include no-depth analysis techniques, e.g., total and summaries</td>
</tr>
<tr>
<td><strong>Dissemination of the results</strong></td>
<td>– Higher importance for practitioners (relevant to industry)</td>
<td>– May be more limited, the aim is to influence the future of the research in a specific topic</td>
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Taken from: Bianca Napoleão, Katia Romero Felizardo, Érica Ferreira de Souza, Nandamudi L. Vijaykumar: Practical similarities and differences between Systematic Literature Reviews and Systematic Mappings: a tertiary study. SEKE 2017: 85-90
Next Week

• Guidelines on how to write an SMS
  • With examples
• Tips & Tricks for report writing
• Tips & Tricks for presenting

Homework (not graded):
Read the papers on SMS posted on course wiki, i.e.


Questions?