



# What Does it Take to Succeed with Your Master Thesis

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# Aim of the Seminar

- Help students to deliver a *high-quality* Masters thesis *on time*



# Topic Selection

- The thesis must entail either
  - a solution either to an advanced engineering problem at the time of writing a thesis
  - or an answer to a novel research question
- Should demonstrate your professional qualities and mastery in the field

# Difficulty of Topics

- Weak topics
  - Sharepoint: An Overview
  - Using Drupal for a Web Site of Online Chess Competitions
  - Introduction to Android Operating System
- What about these instead?
  - Comparative study of Open Source Content Management Systems with Respect to Compliance to Best Practices of W3C Linked Data Platform 1.0
  - Performance Optimization and Memory Footprint Reduction of Android Rich Inter-Application Message Passing System



Deliverables

# EXPECTATIONS

# Deadlines

- **30 September** - deadline for identifying title, supervisor and presentation time slot
- **14 October** - deadline for a 2-page problem statement
- **31 October** - deadline for a draft thesis

# Deliverable 1

- 2-page problem statement containing the following:
  - Short overview
  - Main research question
  - More specific research questions
  - Objectives
  - The initial plan for the Masters project

# Deliverable 2

- A thesis draft containing
  - Structure (placeholders for relevant sections/chapters)
  - Title page
  - Table of contents
  - Abstract
  - Introduction
  - Literature study on state of the art
- The deliverable should reflect that about 80 hours have been spent in its preparation





Getting started

# PRACTICAL HINTS



# Objectives vs Research Questions

- **Main Research Question**
  - *How is and should enterprise modeling be performed when the main purpose of modeling is to support human sense-making and communication?*
- **Partial Research Questions**
  - **RQ1:** *What are the purposes of developing and using enterprise models, and how are enterprise models actually used?*
  - **RQ2:** *What activities are most important in an enterprise modeling process?*
  - **RQ3:** *What are the most important properties of enterprise models, i.e., the artifacts or manifestations of the modeling process?*
- **Research Objectives**
  - **RO1:** *Based on empirical studies of real enterprise modeling projects, formulate a set of assertions concerning enterprise modeling practice when the purpose of modeling is human sense-making and communication.*
  - **RO2:** *Develop a methodological framework based on the above-mentioned assertions to guide practitioners in their enterprise modeling efforts.*

# Introduction (Layout)

- Current trends/technology landscape / terminology
- General problems and solutions
- Specific problems and solutions
- Niche problem (unsolved)
- Solution approach
- Results (including validation results)
- Thesis structure

# Introduction (Content)

- Typically 4-7 pages
- The introduction should define the problem clearly and give sufficient background for the following chapters
  - What is the purpose of the research? Main research questions?
  - What is the scope? Indicate explicitly all limitations and restricting assumptions!
  - Why the topic is important or interesting?
  - What methods are used?
  - Briefly references to related research (just the main references – more references in chapter "Related research" or throughout the thesis)
  - Emphasize your own contribution: what is original or new?

# A Bit Fun

- <http://www.cs.joensuu.fi/pages/whamala/i/sciwri/sciwri.pdf> - algorithmic approach to writing – could be fun
- <http://pdos.csail.mit.edu/scigen/> - to generate examples of a well-and-not-so-well-structured papers

# Background vs Related Work

- Related work – similar approaches to solve the similar research question or solutions to a similar problem
- Background – the framework your solution will be build upon – the formalisms, components, key concepts etc



# Literature Study

- Scholar.google.com (article texts + citations + citation counts)
- DBLP (coauthors, exporting citations)
- Articles (see references, access through utlib)



Learn from the best

**EXAMPLES**





# Probabilistic Localization of a Soccer Robot

- Author: Priit Kallas
- Type: Algorithm application
- Strengths
  - Application of complex algorithms for solving a practical problem
  - Evaluation through simulations and in practical settings
- Weaknesses
  - Structure
  - No explicit statement of a research question / engineering problem



## Role-Based Enterprise Mashups with State Sharing, Preservation and Restoration Support for Multi- Instance Executions

- Author: Liisi Haav
- Type: Software technology
- Strengths
  - Well-structured thesis + introduction
  - Incremental extension and combination of existing frameworks
  - Proof-of-concept implementation
- Weaknesses
  - Research question not explicit
  - Too many contributions
  - No case study

# Insecurity of Transformation-Based Privacy-Preserving Linear Programming

- Author: Alisa Pankova
- Type: Applied mathematics
- Strengths
  - A good review of the technical background and state of the art
  - Systematic approach
  - Challenging research question
- Weaknesses
  - Research question not explicit



# Model-Driven Role-Based Access Control for Databases

- Author: Henri Lakk
- Type: Software engineering
- Strengths
  - Challenging research questions
  - Results published in form of articles
  - Case study
- Weaknesses
  - Structure – instead of a monograph a collection of articles is presented
  - Lost focus – each article has its own focus

# Discovery and Push Notification Mechanisms for Mobile Cloud Services

- Author: Carlos Paniagua
- Type: Platform development
- Strengths
  - Well-structured
  - Non-trivial engineering solution implemented
  - Performance evaluation conducted
- Weaknesses
  - Description of the architecture



# Lightning Fast Business Process Simulator

- Author: Madis Abel
- Type: Application development
- Strengths
  - Solution available online and in practical use
  - Performance comparison
- Weaknesses
  - Structure
  - Description of the architecture



# A Pattern-Based Development of Secure Business Processes

- Author: Naiad Hossain Khan
- Type: Information system design
- Strengths
  - Explicit research questions (see Ch 1.3) and research method description
  - 2 case studies for validation of the developed
- Weaknesses
  - Usability evaluation



<https://courses.cs.ut.ee/2013/enterprise/fall>

**THANK YOU**