Tyranny of Types: Curse or Blessing?
Kickoff Meeting

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Summer Semester 2022
Outline

Organization

Literature

Scientific Writing

Reviews

Presentation

Topics
Organization
<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>Feb. 4th</td>
<td>Pre-course meeting</td>
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<tr>
<td>Mar. 29th</td>
<td>Kickoff meeting</td>
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<tr>
<td>Apr. 4th</td>
<td>Deadline for topic preferences and drop-out (provide at least 3 preferences)</td>
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<td>Apr. 6th</td>
<td>Topic distribution</td>
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<tr>
<td>Until May 6th</td>
<td>At least 1 individual meeting (contact your supervisor to set a date, send any references you want to discuss in advance)</td>
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<tr>
<td>Jun. 5th</td>
<td>Draft report submission</td>
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<td>Jun. 19th</td>
<td>Review submission</td>
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<td>Jul. 3rd</td>
<td>Final paper submission</td>
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<td>Jul. 6th</td>
<td>Voluntary slide submission (if you would like to get feedback)</td>
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<tr>
<td>Jul. 14 and 15th, approx. 9am-15pm</td>
<td>Talks</td>
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Deliverables and Grading

- Report (40%)
  - 5-7 pages
  - use the provided double-column \LaTeX-template
- Presentation (40%)
  - 20-25 min
- 2 Reviews (20%)

- We will use grading rubics (and let you know beforehand)
- It is mandatory to be present during the 2-3 days of presentations
Literature
Citable Literature

**Good to use**
- Papers (conf./journal)
- Books, book chapters
- Published articles
- Manuals

**Try to avoid**
- Websites, Blog articles
- Wikipedia
- Advertisements
- Lecture slides and notes
- Source code
Finding literature

- Starting points: IEEExplore, ACM DL, Google Scholar, ...
  - Select appropriate keywords
  - Many papers/books accessible freely via the library
- Graph algorithms
  - Publications of the same author(s)
  - Publications at the same venue
  - Cites ... (listed references)
  - Cited by ...
- Relevant conferences: POPL, ICFP, OOPSLA, PLDI, (TACAS, CAV)
- Other starting point: your advisor
How to read a paper

Run 1:
   ▶ Abstract
   ▶ What does the paper present? (technique/tool/...)

Run 2:
   ▶ Abstract + Introduction + Conclusion
   ▶ Skim the rest, no details

Run 3:
   ▶ Full text in detail
How to read a paper

▶ Keep notes and questions as you read
  ▶ annotate the paper, or whatever suits you
▶ Try to summarise it with your own words
  ▶ don’t copy or look at the abstract
▶ Make a list of pro’s & con’s
▶ What are the key ideas and insights?
  ▶ may not be the same!
▶ What is new?
  ▶ you don’t have the background, but try to 'guess' from the paper itself
Scientific Writing
Writing Style

- Factual, precise, focused
  - Stay on topic, no story telling, …
  - Limit to important and necessary topics
  - Don’t omit necessary prerequisites
- Avoid forward references
- Avoid I, prefer we (or passive voice)
- ’We’ only describes the authors, not the reader
Citing

- All work that is not yours must be cited
  - Clearly describe source
  - But: no wrong/inaccurate attributions
- Citing styles:
  - Literal (direct) quote
  - Indirect quote (rephrase) ← strongly preferred
- Exception: foundations can be assumed (generally first few Bachelor semesters)
Citing: Examples

The x86 architecture defines the register CR2 [1].

The x86 architecture defines the register CR2. It can be used with the instruction MOV. [1]

Valgrind [1] is a tool for run-time instrumentation.

Valgrind~\cite{nethercote2007} is a tool for run-time instrumentation.

Other approaches [1,2,3] . . .

Other approaches~\cite{foo,bar,baz} \dots
Seminar Report

- like a *Review Paper*

- Abstract: brief summary of the area, problem, approach
- Introduction: problem statement, motivation, ...
- Background: required prerequisites
- Main part: summarize/explain different approaches, show applications/examples, evaluation, comparison, discussion
- Summary and outlook
Reviews
Review

- short summary 1-2 paragraphs
- obligatory: positive feedback
- if necessary: negative feedback in a **constructive form**, suggestions for improvement
Presentation
Content Selection

Presentation for the audience!

- What do you want the audience to take away? (Not: what can I talk about!)
- What are the key points?
- How much content fits into the time slot?
Structure

For example:

- **Motivation**
  - Why is the topic relevant?
- **Background**
  - Consider referencing information from previous talks
- **Concept**
  - Use good/helpful examples
- **Evaluation**
  - How good is the described concept?
  - Critical discussion of the topic
- **Conclusions and outlook**
Media

- Slides
  - For use during the talk
  - Good to prepare
  - Backup slides as preparation for questions
- Whiteboard, blackboard
  - Permanently needed information
  - Answering questions
- Hardware, demonstrators, etc.
- Check possibilities in advance
Title page: Title, name, institution, date, location
On every other slide: number and title
One topic per slide
Avoid text
  \( \leq 8 \) lines
Prefer graphics/illustrations
  You may copy figures from the paper
No unused points
  Cover everything on the slides in your talk
Slides: Colors

- Few colors
  - Use colors sparingly, but systematically
- Sufficient contrast
  - Dark on white
  - Be careful with gradients
- Use special effects **only** when necessary
  - No annoying backgrounds (wave textures, etc.)
  - Animations only with sufficiently added value
Before the Talk

- Prepare slides, etc.
- Do a dry-run
  - Always recommended
  - Helps with uncertainty and time estimation
- Prepare on-site
  - Laptop, Beamer, laser pointer, clock, etc.
Talking Style

- Speak freely
- Don’t go too fast/slow
- Stay in contact with the audience
  - Eye contact, position, etc.
- Usually at least 1 minute per slide
- Stay in time limit
  - Optional slides can fill time
  - Regularly consult a watch
- Stay calm
Topics
Topics

Static vs. Dynamic Typing [BA]
Gradual Typing [BA/MA]
Type Inference Algorithms [BA]

Union and Intersection Types [BA]
Type Classes [BA/MA]
Generalized Algebraic Data Types [BA/MA]
Ownership-based Types [MA]
Effect Systems [MA]
Applications of Refinement Types [BA/MA]
Dependent Types in Idris [MA]
Liquid Types [MA]
Path-dependent Types [MA]

Type-Level Programming [MA]
Type Error Explanation [BA/MA]
Type-Guided Program Synthesis [MA]
Type systems for security [MA]