

Tyranny of Types: Curse or Blessing?

Kickoff Meeting

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Summer Semester 2022

Outline

Organization

Literature

Scientific Writing

Reviews

Presentation

Topics

Organization

Schedule

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

Deliverables and Grading

- ▶ Report (40%)
 - ▶ 5-7 pages
 - ▶ use the provided double-column L^AT_EX-template
- ▶ Presentation (40%)
 - ▶ 20-25 min
- ▶ 2 Reviews (20%)

- ▶ We will use grading rubrics (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.

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

The x86 architecture defines the register CR2 `\cite{intel2019man}`.

The x86 architecture defines the register CR2. It can be used with the instruction MOV. `\cite{intel2019man}` (Absatz)

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

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

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

Slides: Style

- ▶ Title page: Title, name, institution, date, location
- ▶ On every other slide: number and title
- ▶ One topic per slide
- ▶ Avoid text
 - ▶ ≤ 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]