Revision course
Functional Programming and Verification

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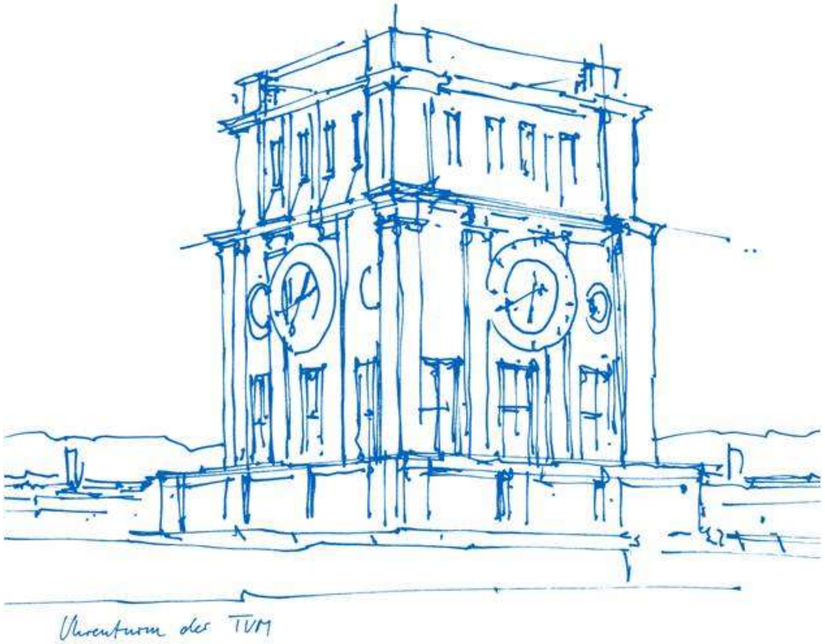

Organization

Wednesday, June 17th 2 pm - 6 pm	recursion, list comprehensions, higher-order functions
Wednesday, June 24th 2 pm – 6 pm	automated theorem proving
Friday, June 26th 3 pm – 7 pm	algebraic data types, type classes, type inference
Wednesday, July 1st 2 pm – 6 pm	IO, evaluation/reduction

Schedule

Session 1 – functional programming and Haskell

- Haskell fundamentals
- recursion, guards, pattern matching
- list comprehensions
- QuickCheck
- polymorphism
- currying, partial application
- higher-order functions (incl. `fold`)

Session 2 – algebraic data types, type classes, type inference

- type classes
- algebraic data types (e.g. `Maybe`)
- modules and abstract data types
- type inference

Schedule

Session 3 – automated theorem proving

- structural induction
- case analysis
- extensionality
- computation induction

Session 4 – IO, evaluation/reduction

- correctness
- IO (monads)
- evaluation strategy (incl. infinite data structures)
- complexity and optimization

Structure

1. I give a brief introduction to the topic and underlying theory
2. we go over an example problem together
3. you work on problems
4. we compare results
5. I provide additional practice problems and further references

Important for you:

- ask questions!
- let me know when you want to spend more time on a topic

Slides, problems, and solutions can be found on GitHub:
https://github.com/jonhue/teaching-fpv-rev

Setup

Does everyone have a laptop with a functional installation of Haskell?