TECHNISCHE UNIVERSITÄT MÜNCHEN
FAKULTÄT FÜR INFORMATIK

Programming Languages

Dr. Michael Petter

Recordings at http://ttt.in.tum.de

Winter term 2018

⚠ This is **not** a basic programming course!

Examples are formulated in Basic Languages

- Basic Language 1: Java
- Basic Language 2: C/C++
- Basic Language 3: Lisp/Scheme
- Beneficial: Lua, Haskell, Ocaml, JavaScript, ...

Building Blocks for Programming Languages

We present *selected topics* that focus on current issues in the design or implementation of programming languages from POV of compiler construction:

1. Memory Model

1. Relaxed Memory Models
2. Wait-Free Algorithms
3. Lock-Free Algorithms
4. Application: Locks and Monitors

2. Control flow in Concurrent Systems

1. Transactional Memory
2. Coroutines and Continuations

3. Method Dispatching

1. Multimethods
2. Multiple Inheritance

4. Modularization

1. Mixins and Traits
2. Prototype based Languages

5. Metaprogramming

1. Aspect Orientation
2. Homoiconic Metaprogramming

Lecture Concerns

Lecturer: Dr. Michael Petter: `petter@in.tum.de`

Exercises: Raphaela Palenta: `raphaela.palenta@tum.de`

Lectures:

- every Wednesday at 14:05pm
- we aim for 12+ lectures
- guest lecture
- no lecture/tutorial during holidays: 24.12. – 06.01.
- slides on `http://www.in.tum.de/i02/teaching`
- lectures are recorded `http://ttt.in.tum.de/lectures`

Exam:

- there will be *a single* written exam (contact me for scheduling problems)
- there is *no repeated* exam in this winter or the following summer semester

Exercises

Exercises:

- an exercise sheet is made available with every lecture
- solving the sheets is *voluntary* but *highly recommended*

Tutorial sessions:

- for now, Fridays, 08:30am in this room (H2), starting *Oct. 26*
- the exercises are meant to be completed *at home in advance*
- solutions to these exercises will be presented
- be there if you have
    - questions in general
    - problems with the exercise sheet

Specialize on selected topics!

Programming Languages offer a variety of pearls well suited for
Micro-Seminars

- Earn a .3 bonus on the final exam
- Topics announced in December
- Topics presented in February