

Quantitative Verification

Introduction & Organization

Jan Křetínský

Technical University of Munich

Winter 2020/21

Organization

- ▶ Module IN2340
- ▶ Language: English
- ▶ Dates:
Tuesday 12–14 (?)
Wednesday 10–12 (?)
- ▶ Lectures (given by Jan Kretinsky) and exercises/tutorials (given by Kush Grover) are flexible
- ▶ Location: HS2 or online (?)

Topic

- ▶ modelling, specification and analysis of hardware and software system
- ▶ focus on the fundamental aspects of time, probability, cost, and their combinations
- ▶ ask and automatically answer questions on dependability and performance
 - ▶ "Is it possible that the system will crash within 30 seconds?"
 - ▶ "What is the probability of a system failure in the next 24 hours?"
 - ▶ "How to schedule tasks in a business process at a minimum cost?"
- ▶ timed automata and timed logics, Markov chains, Markov decision processes, probabilistic logics, optimization criteria and algorithms, continuous-time stochastic systems and hybrid systems

Prerequisites

- ▶ introductory courses to the theory of computation, probability theory, linear algebra
- ▶ automata & model checking advantageous but not required

Material

- ▶ Christel Baier and Joost-Pieter Katoen: Principles of model checking (Chapters 9 and 10)
- ▶ recent research papers

- ▶ Slides, tutorial sheets and announcements on the website <https://www7.in.tum.de/~kretinsk/teaching/qv.html>