

# Quantitative Verification

## Introduction & Organization

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## Organization

- ▶ Module IN2340
- ▶ Language: English
- ▶ Lecture: Tuesday 14:05 - 15:35 in MI 03.09.014  
(given by Jan Kretinsky, starting on Oct 16)
- ▶ Tutorials: Thursday 10:15 - 11:45 in MI 03.09.014  
(given by Tobias Meggendorfer, starting on Oct 18)

## 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, 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/fa.html>