Organization Matters

- Lecture
  - Thu, 1-3, ETZ E9
  - Roger Wattenhofer

- Exercises
  - Thu, 3-5, ETZ E9
  - Klaus-Tycho Förster, Tobias Langner, Jochen Seidel

- Course Material
  - Check www.disco.ethz.ch → courses

Some Comments

- English vs. German language

- Course material pretty stable
  - Slides/material on web site before lecture...

- Differences to last year’s course
  - A few new things... a few things dropped...

- ITET vs. other types of students...
Course Overview

- Part 1: Theory of Coke Vending Machines
  - Automata and Languages
  - Discrete Event Systems (DES) Models

- Part 2: Theory of Standing in a Line
  - Stochastic Processes
  - Markov Chains, Queuing Theory
  - Average Case Analysis of DES

- Part 3: Theory of Renting Skis
  - Online & Streaming Algorithms
  - Worst-Case Analysis of DES

- Plus a few smaller parts

Motivation: Orthodox EE

- Science is often based on natural phenomena
- Laws of physics: mechanics, gravitation, electrodynamics
- Continuous variables for mass, velocity, power, etc.
- Can be solved by differential equations

Motivation: Discrete Events

- Some complex systems are not [primarily/only] continuous
  - Computer systems
  - Communication networks
  - Business processes ("workflow")
  - Transportation systems
  - Software

- Instead, systems are determined by discrete events
  - Telephone calls
  - Customers arrivals

  "Theoretical Computer Science for IT/EE students"

Motivation: System Classification
Some Literature

- **Part 1**
- **Part 2**
  - Thomas Schickinger, Angelika Steger: Diskrete Strukturen, Band 2. Springer, 2001. (Chapters 1, 2, and 4)
- **Part 3**
- Plus research papers...