Discrete Event Systems

Introduction

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Discrete Event Systems
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Why should you care?
Being based on natural phenomena, Science is often explained by continuous variables.

\[ F = G \frac{m_1 m_2}{r^2} \]
Being based on natural phenomena, Science is often explained by continuous variables solved by differential equations.
Many complex systems are not continuous...
Somewhere inside Google datacenters

computer systems
transportation systems

NYC subway system
Those systems are determined by discrete events

Customers requests
Telephone calls
Train arrivals
Incoming data
Equipment failures
...

In this course, you’ll learn how to

Model
Analyze
Design Discrete Event Systems
Test
Optimize
some examples

Model  
Analyze  
Design  
Test  
Optimize

automata & petri nets  
average-, worst-case viewpoint  
out of a specification  
proof system properties  
minimize the system size
There will be 3 professors in the course

**Part I**
- Laurent Vanbever
- Automatas

**Part II**
- Roger Wattenhofer
- Stochastic process

**Part III**
- Lothar Thiele
- Specification model
Week 1-5
Laurent Vanbever
Automatas

Week 6-10
Roger Wattenhofer
Stochastic process

Week 11-13
Lothar Thiele
Specification model
## Course organization

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