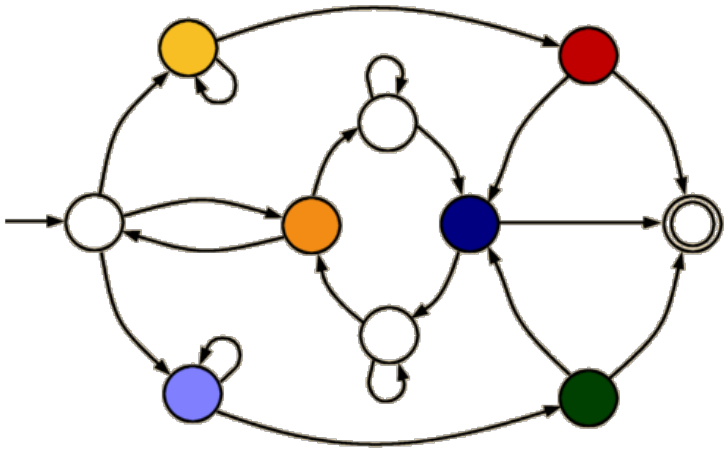
Discrete Event Systems

Introduction



Laurent Vanbever

www.vanbever.eu

ETH Zürich (D-ITET)

September, 20 2018

Discrete Event Systems

Discrete Event Systems

Why should you care?

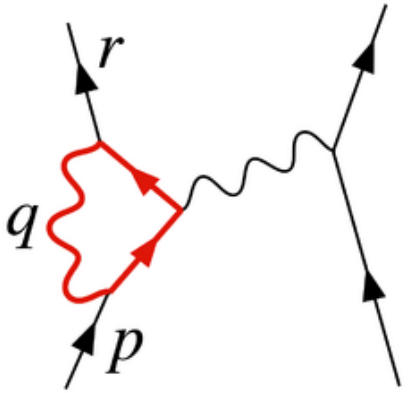
Being based on natural phenomena,

Science is often explained by continuous variables

Mechanics

$$F = G\frac{m_1 m_2}{r^2}$$

Gravitation

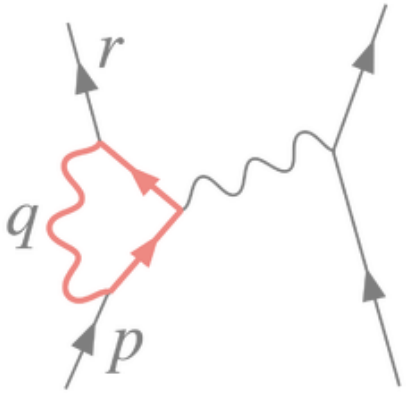


Electrodynamic

Being based on natural phenomena,

Science is often explained by continuous variables

$$F = G\frac{m_1 m_2}{r^2}$$



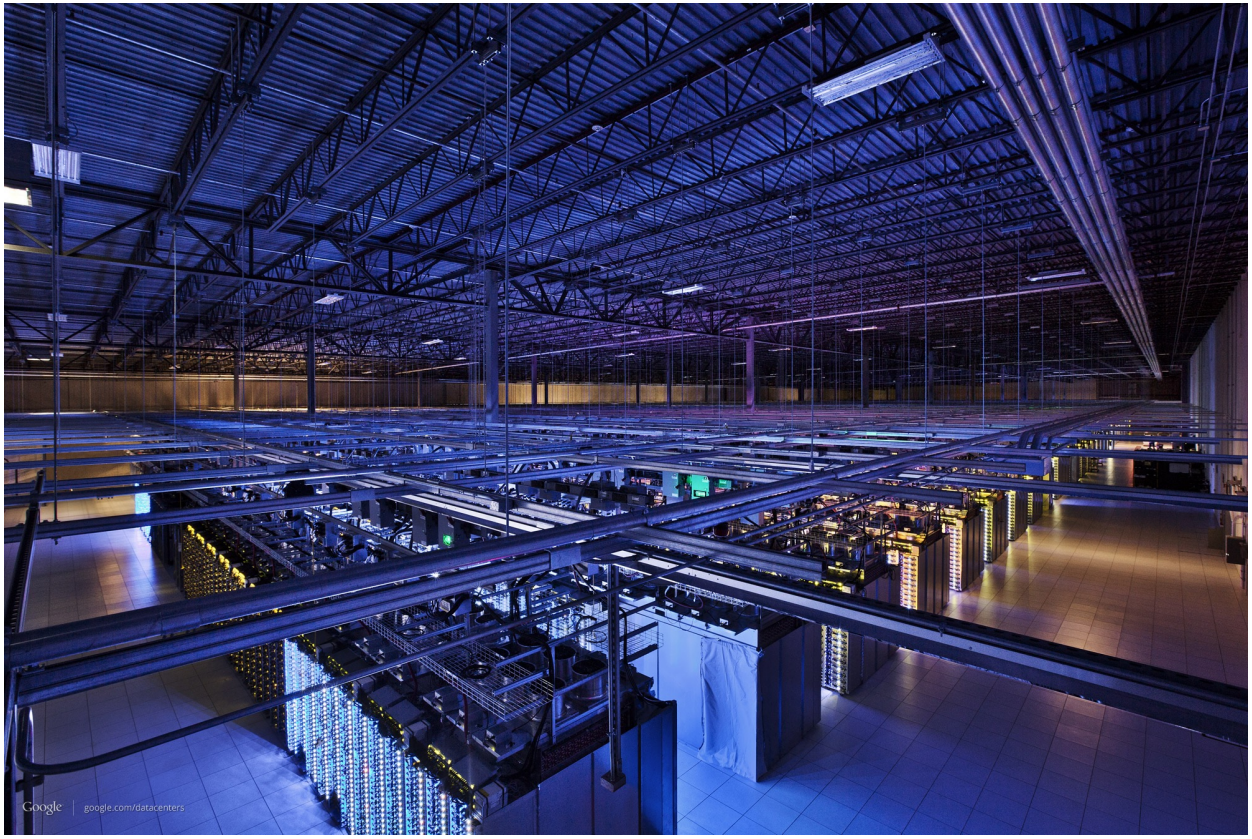
Mechanics

Gravitation

Electrodynamic

solved by differential equations

Many complex systems are not continuous…



computer

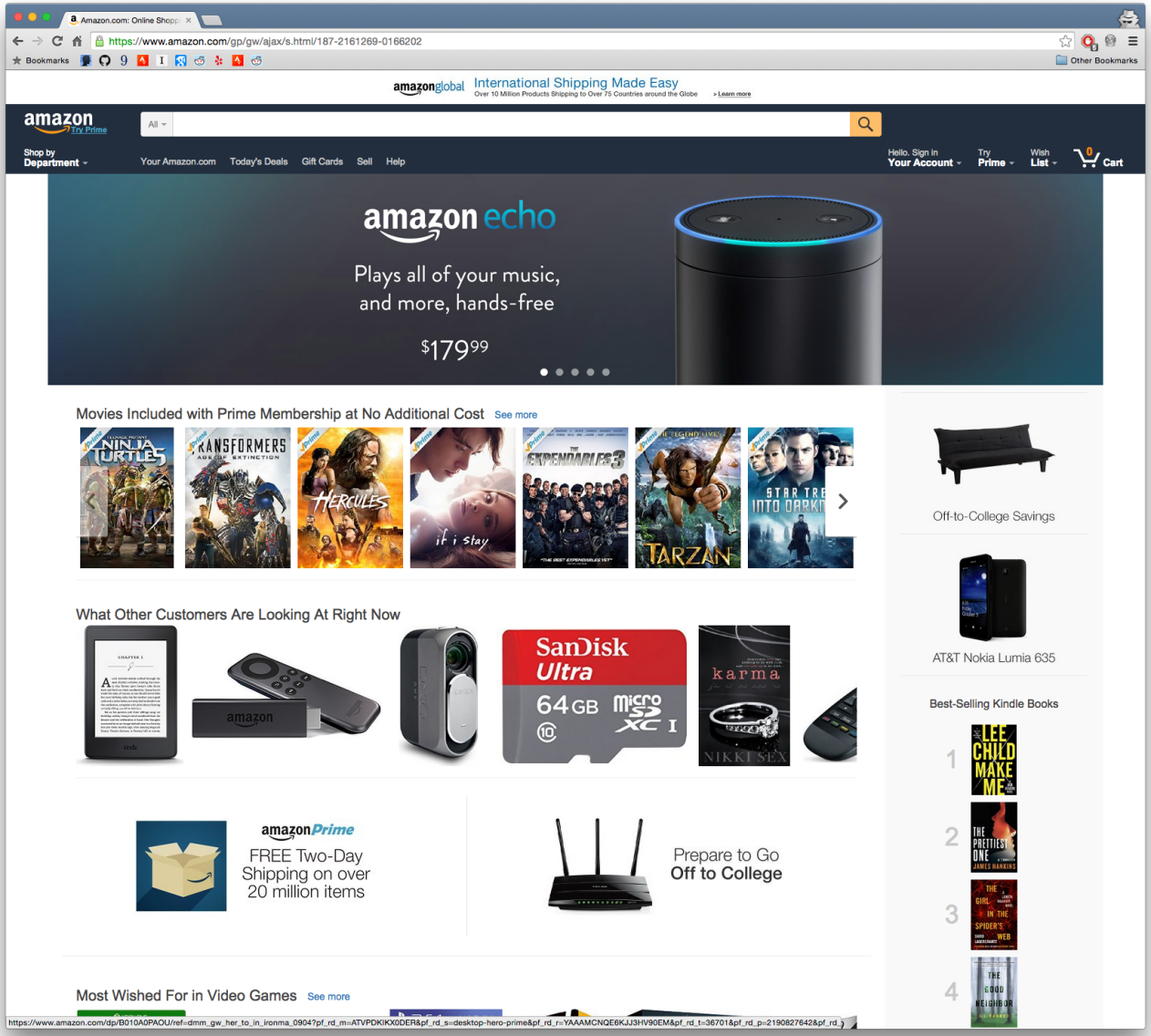
systems

Somewhere inside Google datacenters

NYC subway system

transportation

systems



amazon.com home page

software

systems

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

Test

Optimize

Discrete Event Systems

some examples

Model	automata & petri nets
Analyze	average-, worst-case viewpoint
Design	out of a specification
Test	proof system properties
Optimize	minimize the system size

There will be 3 professors in the course

Part I	Part II	Part III
		
Laurent Vanbever	Roger Wattenhofer	Lothar Thiele
Automatas	Stochastic process	Specification model

Week 1-5

Laurent Vanbever

Automatas

Week 6-10

Roger Wattenhofer

Stochastic process

Week 11-13

Lothar Thiele

Specification model

Course organization

Lectures	Thursday 1pm-3pm @ETZ E 6
Exercices	Thursday 3pm-5pm @ETZ E 6
Materials	http://www.disco.ethz.ch/lectures/des/