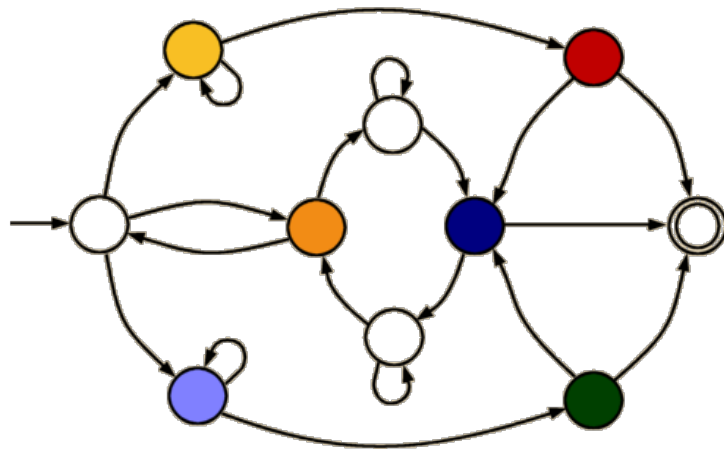# Discrete Event Systems

Introduction

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September, 21 2017

Discrete Event Systems

Discrete Event Systems

Why should you care?

Being based on natural phenomena,

Science is often explained by continuous variables

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

Mechanics Gravitation Electrodynamic
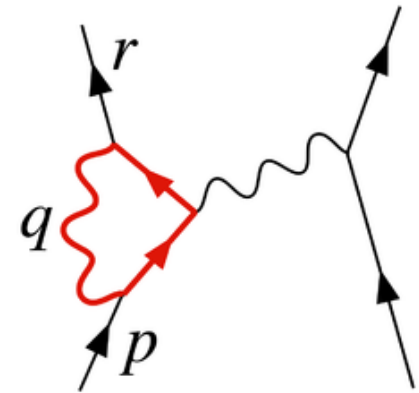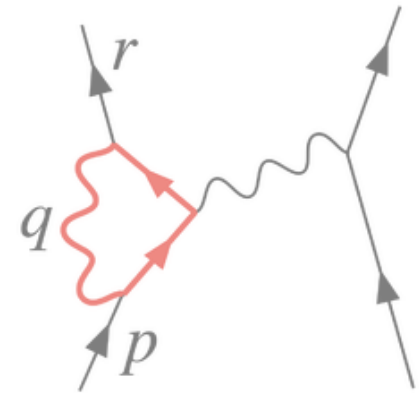
Being based on natural phenomena,
Science is often explained by continuous variables

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

Mechanics   Gravitation   Electrodynamic

solved by differential equations
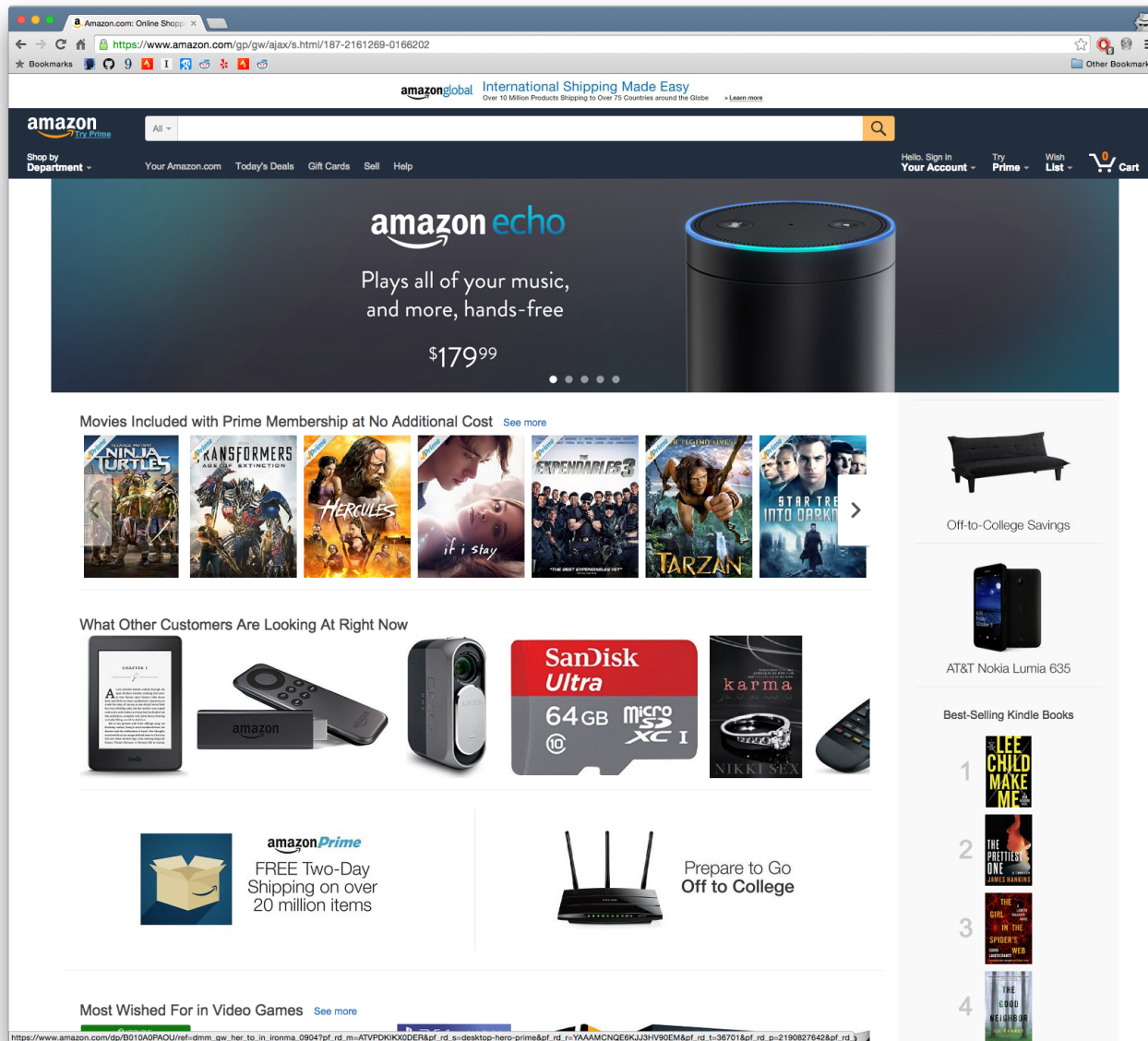
Many complex systems are not continuous…

computer systems

Somewhere inside Google datacenters

transportation

systems

NYC subway system

software

systems

amazon.com home page

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	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   Week 6-10   Week 11-13

Laurent Vanbever   Roger Wattenhofer   Lothar Thiele

Automatas   Stochastic process   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/