Discrete Event Systems

Introduction

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Discrete Event Systems

Discrete Event Systems

Why should you care?

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

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

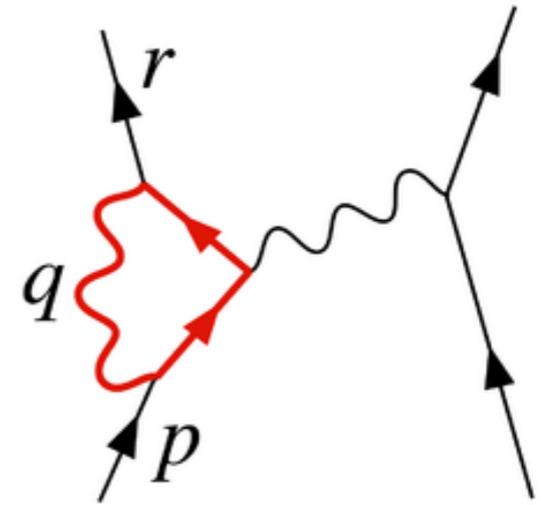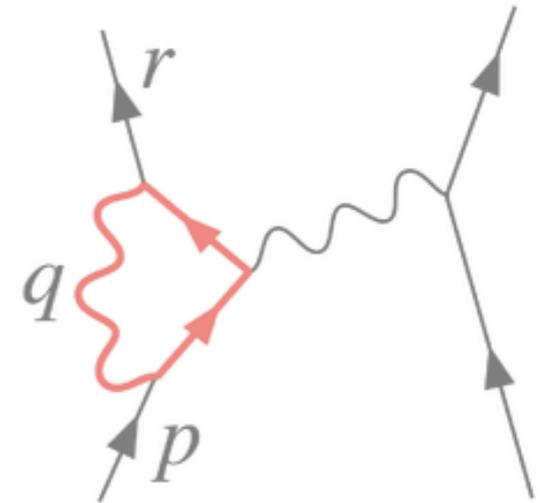Mechanics   Gravitation   Electrodynamic

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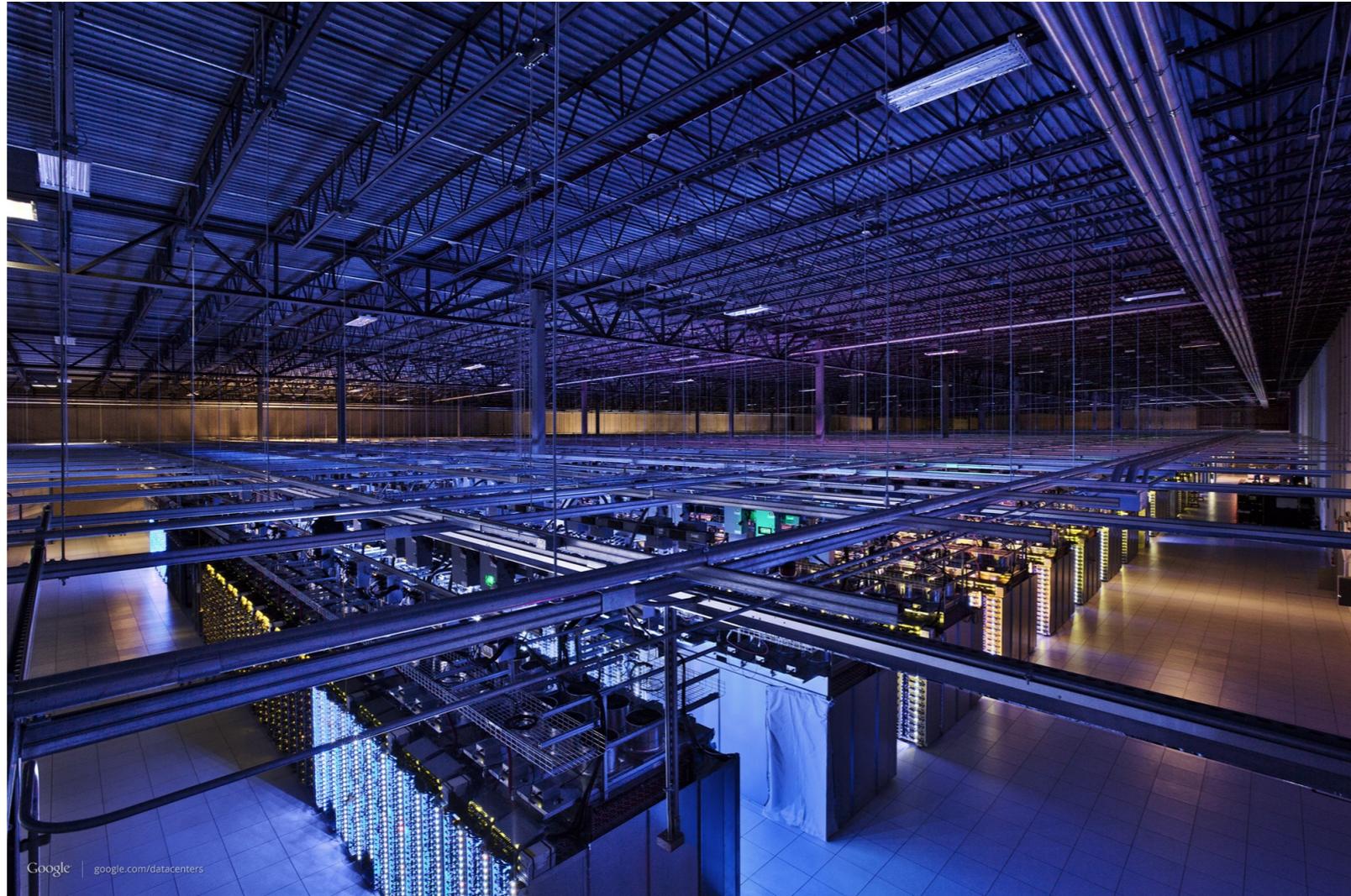

Mechanics

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

Gravitation

Electrodynamic

solved by differential equations
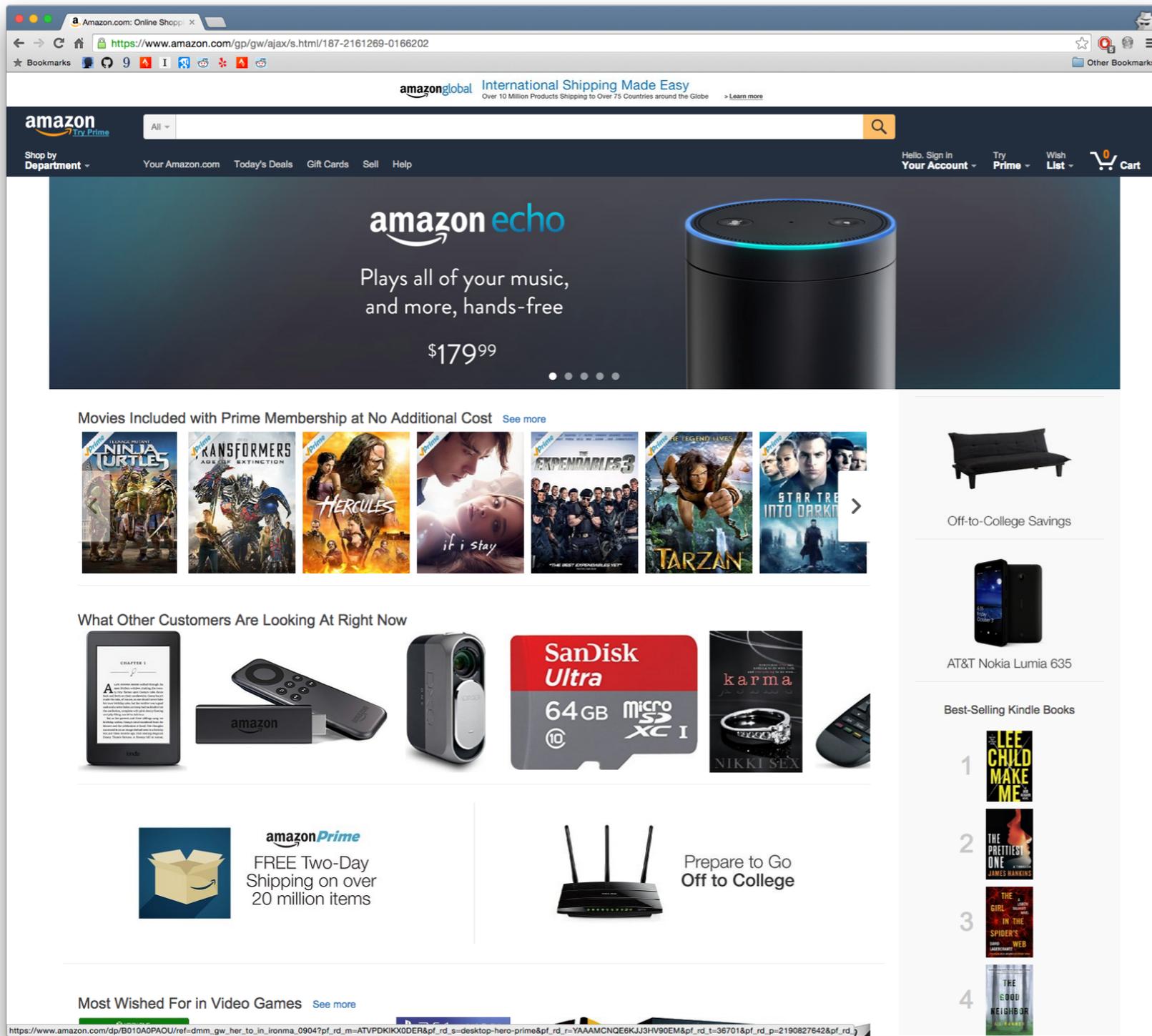
Many complex systems are not continuous…

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 2pm-4pm**
	Zoom
Exercices	**Thursday 4pm-6pm**
	Zoom
Materials	**https://disco.ethz.ch/courses/des/**