**EPFL**

**CS-718**

# Topics in Computational Social Science (2019)

West Robert

| Cursus | Sem. | Type |
|---|---|---|
| Computer and Communication Sciences | | Obl. |

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| Language of teaching | English |
| Credits | 4 |
| Session | |
| Exam | Multiple |
| Workload | 120h |
| **Hours** | **56** |
| Courses | 28 |
| Exercises | 14 |
| Project | 14 |
| **Number of positions** | **11** |

**Frequency**

Every year

**Remark**

Next time: Spring 2019

**Summary**

This is a seminar course. By commonly reading and discussing an introductory book, as well as important papers, about computational social science, students will become familiar with core issues and techniques in the field.

**Content**

Data collected through digital systems, such as online social networks, search engines, mobile phones, apps, etc., offer great opportunities for addressing important research questions about individual as well as collective human behavior. Whereas such issues had previously been studied primarily by social scientists, the sheer size of modern social data sets, as well as the fact that they are produced within computational systems, requires computational ways of thinking about, and processing, them.

The goal of this seminar is to acquaint students with some of the fundamental questions and techniques arising in the context of computational social science, e.g.,

- network analysis of social systems,
- machine learning and data mining for social systems,
- text analysis and natural language processing of social phenomena,
- large-scale social experiments,
- drawing valid conclusions from "found data" (a.k.a. observational studies),
- integrated human-machine decision-making (incl. crowdsourcing),
- algorithmic bias and accountability,
- social information and communication dynamics (e.g., information diffusion),
- ethics of computational research on human behavior.

We will explore the above topics simultaneously in two ways:

1.
We will read the book "Bit By Bit: Social Research in the Digital Age" by Matthew Salganik (available online for free).
2.
We will read important research papers from computational social science that provide a deep dive into the topics discussed in the book.

Every week, we will focus on one book chapter and one or two accompanying papers. All students will write a short summary and review of the respective paper, and one student will lead the in-class discussion. Beyond familiarizing themselves with research in the field, students will become better at assessing and critiquing scholarly work (by discussing and reviewing papers).

**Note**

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**Learning outcomes:**
An overview of the important research questions posed in computational social science, and of the tools and techniques available; an increased ability to summarize and critique scientific papers**.**

**Keywords**

computational social science, social networks, text analysis, natural language processing, information dynamics, machine learning

**Learning Prerequisites**

**Required courses**

No formal prerequisites, but we expect students to have a basic understanding of statistics, probabilities, and machine learning**,**