CS-234

Technologies for democratic society

Ford Bryan Alexander

Cursus	Sem.	Type
Communication systems	BA3	Opt.
Computer science	BA3	Opt.

Language of teaching	English
Credits	5
Session	Winter
Semester	Fall
Exam	Written
Workload	150h
Weeks	14
Hours	**5 weekly**
Courses	2 weekly
Exercises	1 weekly
Project	2 weekly
Number of positions	

Summary

This course will offer students a broad but hands-on introduction to technologies of human self-organization.

Content

The course will present students with a view of self-organization technologies set in a long-term historical perspective, extending from their roots in ancients principles of democracy and governance, up to recent high-tech innovation such as social networking, e-voting, blockchains, and delegative democracy. The course will cover the many fundamental organization challenges these technologies attempt to address, such as :

- Coordination : do participants communicate in person, electronically, or by passing secret notes ?
- Membership : who has the right to participate as a member or citizen ? Can membership be faked ?
- Equity or fairness : how much power or weight does each participant have ? Can weight be hacked ?
- Filtering : how to separate signal from noise, real expertise from appealing bluster ?
- Scalability : does the self-organizing technology work for only 10 members, or 100? 1000 ? 1 M ? 1 B ?
- Integrity : how does self-organizing technology prevent hacking or tampering by malicious parties ?
- Self-determination : does the technology protect freedoms such as expression and association ?
- Privacy : what acts of participation does the technology keep private, and what are considered public?
- Representation : is participation direct or representative ? How are representatives chosen ?
- Accountability : how are participants and/or representatives kept accountable for their actions ?
- Transparency : does the technology allow participants to verify that it is operating correctly ? How ?
- Incentives : how does the technology encourage or incentivize people to use it, for good or ill ?
- Psychology : how does the technology interplay with the unique properties of the human mind ?

Learning Prerequisites

Important concepts to start the course

Basic computing and programming skills

Learning Outcomes

By the end of the course, the student must be able to:

- Explore technologies available for societal self-organization
- Expound key challenges and risks in using these technologies

- Discuss social implications of digital communication and organization technologies

Teaching methods

The course will use readings, discussions, and exercises to lead students through an exploration of the vast number of different technological approaches to these challenges and issues, from extremely low-tech (e.g., picking representatives by drawing straws) to the latest experimental technologies. In different weeks the students will explore hands-on the architecture, design, practical use, and strenghts and weaknesses of different self-organization technologies, such as :

- Public discussion forums such as UseNet, Twitter, and Reddit
- Community self-organization systems such as Loomio
- Peer review systems such as HotCRP
- E-voting systems in use in around the world (especially the US and Switzerland)
- Experimental participatory delegative democracy systems such as LiquidFeedback
- Cryptocurrencies and smart contract systems such as Bitcoin and Ethereum

The course work will involve a substantial amount of reading background materials, both technical and non-technical and from a variety of disciplines including computer science, social science, political science, and law. The lectures will be heavily discussion-oriented, covering both the background readings and hands-on exercises in addition to material presented in the lectures.

Expected student activities

The course will encourage students to "learn by doing" through exercises with practical systems. Students will be required to use some of these systems in groups in "hands-on" self-organization exercises, to get firsthand comparative experience of how they work, and in what ways they succeed and fail.

Assessment methods

Students will be assessed through regular exercises and mini-quizzes, participation in "peer review" activities, a small project in the second half of the semester on which the students must report, and a written final exam. Grading will be based substantially on demonstrated active participation in the deliberative course exercises, in addition to learning and understanding of the course content itself.

Supervision

Office hours	Yes
Assistant.e.s	Yes
Forum	Yes

Resources

Moodle Link

- https://go.epfl.ch/CS-234