Blockchains & Distributed Ledgers

Lecture 00 - Syllabus

Aggelos Kiayias

Administrivia

- Course times: Weekly, Monday 14.10 - 16.00, 2.2 Appleton Tower
- Website: http://www.inf.ed.ac.uk/teaching/courses/bdl/
- Course project is in smart contract programming.
  - + exercises for practice (not marked)
- Grading
  - 30% course project + 70% final exam.
  - Project: requires smart contract programming (Solidity / Ethereum)
  - Exam: multiple choice, (30-40 questions, 4 choices, negative marks for wrong answer)

Office hours

- We use Piazza as a forum for questions and answers
- https://piazza.com/ed.ac.uk/fall2019/infr11144/home
- You **must** sign up to be able to ask questions and read the answers!
- Feel free to answer the questions by your fellow students if you know the answer

Contact

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Tentative Schedule

Lecture 01 (16.09.2019) Introduction to blockchains and distributed ledgers
Lecture 02 (23.09.2019) Network and important data structures.
Lecture 03 (30.09.2019) Distributed ledger as a platform. Ethereum.
Lecture 04 (07.10.2019) Smart contract design.
Lecture 05 (14.10.2019) The consensus problem.
Lecture 06 (21.10.2018) Distributed ledger economics and incentives.
Lecture 07 (28.10.2019) Byzantine fault tolerance and stake based blockchains.
Lecture 08 (4.11.2019) Anonymity and privacy in blockchain protocols.
Lecture 09 (11.11.2019) Secure Multiparty Computation.
Lecture 10 (18.11.2019) Applications of distributed ledgers.
Summary (25.11.2019) Summary.

Bibliography

- We will study from the notes and papers, such as
  - Bitcoin: A Peer-to-Peer Electronic Cash System, Satoshi Nakamoto
  - Ethereum Whitepaper, Vitalik Buterin
  - The Bitcoin Backbone Protocol: Analysis and Applications, Juan Garay, Aggelos Kiayias, Nikos Leonardos
  - SoK: Research Perspectives and Challenges for Bitcoin and Cryptocurrencies
    - Bonneau J, Miller A, Clark J, Narayanan A, Kroll JA, Felten EW
  - More at: https://github.com/decrypto-org/blockchain-papers
- A relevant overview book (with freely available preprint) that you may find interesting (it is **not** necessary for the course)
  - "Bitcoin and Cryptocurrency Technologies", Princeton
    - Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller, Steven Goldfeder