Blockchains & Distributed Ledgers

Course Administrativia

Dimitris Karakostas

Administrivia

- Course times: Weekly, Monday 14.10 - 16.00, live online
- Website: https://course.inf.ed.ac.uk/bdl
- Course assignments (require smart contract programming)
  - Assignment #1: Interacting with a Distributed Ledger and Basic Principles (20%)
  - Assignment #2: Smart Contract Programming Part I (30%)
  - Assignment #3: Smart Contract Programming Part II (30%)
  - Assignment #4: Designing and deploying IT services using a distributed ledger (20%)

VIRTUAL CLASSROOM BDL

THE UNIVERSITY of EDINBURGH

Etiquette

During discussions, please use the **raise your hand** function and wait for the lecturer or facilitator to ask you to speak.
Mute your microphone unless it's your turn to speak.
You can type a question or comment at any time in the text chat.

Identity

Why is my name displayed?
Your name is displayed to the lecturer or facilitator and the other students and you are able to see their names. This is to help keep the learning space secure, support academic community and student engagement, and run the session effectively.
Do I have to turn my video on?
No, you don't have to. However turning your video on when you speak can make it easier for us to get to know each other and work together.

This class will be recorded

Your lecturer will tell you whenever recording starts and stops.
Who can view the recording? Only the students and staff on this Course. You must not share it further. To do so would breach University regulations, copyright law and, perhaps most importantly, the trust that's required between us all to keep your learning environment safe.
What if I don't want to be recorded? You can ask the lecturer in advance of the lecture, or during it, to stop recording while you contribute.
Is the text chat recorded? Normally, yes. The lecturer or facilitator will tell you whether the chat is anonymous or identifiable.

Office hours

- We use Piazza as a forum for questions and answers
- https://piazza.com/class/ktoancm138h20w
- 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 (20.09.2021) Introduction to blockchains and distributed ledgers
Lecture 02 (27.09.2021) The blockchain network and related data structures.Assignment #1.
Lecture 03 (4.10.2021) The blockchain as a platform.
Lecture 04 (11.10.2021) Pitfalls and security vulnerabilities in smart contracts. Assignment #2.
Lecture 05 (18.10.2021) The consensus problem.
Lecture 06 (25.10.2021) Byzantine fault tolerance. Permissionless vs. Permissioned Ledgers.
Lecture 07 (1.11.2021) Distributed ledger economics and incentives. Assignment #3
Lecture 08 (8.11.2021) Anonymity and Privacy in blockchain protocols.
Lecture 09 (15.11.2021) Secure Multiparty Computation. Assignment #4
Lecture 10 (22.11.2021) Networking issues in blockchain systems. Legal aspects.
Summary & Overview (29.11.2021) Summary and Overview. Student Questions.

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
  - SoK: A Consensus Taxonomy in the Blockchain Era, Juan A. Garay, Aggelos Kiayias
  - More material at: https://github.com/decrypto-org/blockchain-papers
- Although not a prerequisite for taking the course, a relevant overview book, with a freely available preprint, which you may find interesting is:
  - "Bitcoin and Cryptocurrency Technologies", Princeton, Arvind Narayanan, Joseph Bonneau, Edward Felten, Andrew Miller, Steven Goldfeder