

Course Overview

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What This Course is About

- Blockchain technologies
- Design principles of blockchain systems, i.e., cryptocurrencies like Bitcoin and Altcoins
- Dive into sub-topics in blockchain:
 - Proof-of-work and Mining
 - Consensus Algorithm and Scalability
 - Smart contracts and VM
 - Security attacks

Group Formation

- A group of three students will work together on seminar presentation and project.
- Group formation deadline: Jan 22nd
 - Student without a group will be assigned to a group
- **Each group member needs to do a fair share of work!**

Lectures & Paper Reading

- Lectures:
 - Covers basic topics in the blockchain area
 - Provide background knowledge for paper reading and seminar discussions
- Paper/Material Reading & Review:
 - A list of technical papers or materials to read
 - Answer several discussion questions regarding about the papers
 - Discussions are encouraged, **but write your own words!**
 - Submit before each class
- **Goal:** Encourage critical thinking on blockchain technologies!

Seminar Discussion

- One group presents on each seminar session to drive the discussion
- Seminar discussion topics:
 - New blockchain projects – reviewing their white papers
 - Scalability solutions
 - Security attacks on blockchains
 - Mining algorithms
 - The list of candidate topics is at Piazza

Final Project

- Each group select an open-ended project to work on.
- Submit summary and present at the end of the course
- Project topics:
 - Understand consensus algorithms with simulations/experiments
 - Detect smart contract vulnerabilities
 - Security attack simulation
 - Optimize blockchain performance
 - Optimize mining algorithms
 - The list of potential project topics will be posted at course website

Grading Policy & Time

- Homework (Paper reading & review): 25%
 - Discussion participation: 25%
 - Seminar presentation: 25%
 - Final project: 25%
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- Lecture: Monday 1-3 pm, WB 119
 - Office Hour: Monday after class or send me emails.

Contact Information

- Instructor: Fan Long
 - Email: fanl@cs.toronto.edu
- Course Website: <https://q.utoronto.ca/courses/337068>
- All announcements, homework, and resources are there!
- Piazza Website:
<https://piazza.com/utoronto.ca/winter2024/csc2125hf/home>
- Piazza is a great place to post questions and to start discussions.
- TA: Vlad Nekriach
 - Email: vladyslav.nekriach@mail.utoronto.ca

Action Items

- Enroll Piazza if you want to join discussions
- **Find your groupmate!**
- Start to read Bitcoin whitepaper
- Check candidate seminar topics in the course website
- Each group picks a ranked list of three interested topics
- Homework1 is due Jan. 22nd
- Questions?