IN5420/9420 Distributed Blockchain Technologies

Seminar overview

Given by: Thiago Garrett (thiagoga@ifi.uio.no)

Teaching assistants:
- Andrea Merlina (andremer@ifi.uio.no)
- Praveen Manimaran (praveema@ifi.uio.no)



Outline for the first two lectures

- Seminar overview
- Discussion of the topics and reading material
- Overview of the state-of-the-art
- Reading, reviewing, and presenting papers

Learning goals

- The seminar provides students with a basic understanding of:
  - State-of-the-art in one of the most popular technological areas today
  - Reviewing and summarizing research papers and presentations
  - Participating in research/technology discussions with peers
- The seminar covers
  - Bitcoin concepts, principles, and architecture
  - Origins and concepts of blockchain
  - Most popular blockchain systems today (Ethereum, Hyperledger, IOTA)
  - Blockchain storage technologies
  - Scalability of the data update (consensus) protocols
  - Blockchain business logic and applications

Seminar Elements

- 2 lectures
  - Overview of the course
  - Overview of the area
  - Advice for reviewing and presenting papers
- Two practical assignments (~1 week in total)
  - Simple implementation of blockchain data structures along with some operations (in Python)
  - Analysis of blockchain metrics extracted from real networks
- Material
  - A textbook (the preprint is available for download)
  - Assorted collection of specific papers, tutorials, web pages, ...
  - Clustered into topics
  - Constitute (most of) the examinable material
  - List available in Leganto and as a PDF

Seminar Elements (cont'd)

- Each student presents one topic
  - The presentation should take **50 to 70 minutes**
  - Other students
    - **read the material for that topic**
    - submit a short summary (2 paragraphs or half a page) **before the presentation**
    - **ask questions** during the presentation
  - Summaries are submitted by email to the TA (Andrea) and published
  - A small opponent committee for the presentation (1-2 students)
    - Prepares **at least 10 questions** for the topic beforehand; more is better
  - The presentation is followed by a joint discussion
    - Takes approximate 65 to 85 minutes
    - Core of the seminar; **active participation in discussions is essential**
    - Committee has a dialogue with the presenter; everyone needs to participate
- If there are more topics than students, the teacher (or TAs) will present the remaining topics

Elements of the student presentation

- Presentation of the material listed for the topic, focusing on the main aspect described in the reading list
- Critical reflection on the material, that is student's personal opinion and reasoning
- Open questions
- We as teachers provide guidelines, answer questions, and help resolve your dilemmas

- For some topics, the papers are not closely related
  - Each presentation is followed by a separate discussion, before the next paper is presented
  - Opponents prepare a separate list of questions for each paper
- For other topics, the papers are connected
  - A single discussion and list of questions for all papers

Exam and grading

- Presentation and participation in an opponent committee
- Submission of two practical assignments (half and end of semester)
- Mandatory summary submission for each student presentation (except your own)
  - Not graded but it is a prerequisite for taking the exam
  - Must be emailed to the TA at least 1 day bef. the presentation
- To get access to the exam and be graded for the course:
  - Necessary to submit 75% of summaries and participate in 75% of discussions (i.e. a student can skip at most 3 summaries and 3 discussions)
  - Satisfactorily complete the assignments
- Oral exam
  - Paper pool and other results of seminar activity
- Grading based on
  - Student's presentation (50%)
  - Oral examination at the end of the seminar (50%)
  - Active participation in the opposition and discussions (tiebreaker)

Required/recommended prior knowledge

- IN5020 – Distributed systems or another course in distributed systems
  - Most relevant aspects are: P2P, data replication, and consensus protocols
- Knowledge/courses in cryptography and to a lesser extent, other security-related courses
- Python programming experience for the programming assignment

Plan for the rest of the course

- 26th of January
  - An overview of the state-of-the-art (Thiago)
  - Short presentation on reading, reviewing and presenting research papers (Thiago)
- We will collect your preferences wrt the dates and topics and build a schedule
  - Deadline for submitting preferences: 23:00 on Fri 21st of Jan
- A detailed plan will be provided on Wed 26th of Jan
  - No student presentation that day
- 2nd of February: first preference-based presentation
- No lecture on the weeks of the assignments (16.03 and 25.05)
- Assignments deadlines: 18.03 and 27.05

How to submit preferences

- Send email with the following content to the TA by the deadline
  1. Your name
  2. The topic that you prefer to present the most
  3. 2nd (backup) preference for a topic
  4. 3rd (backup) preference for a topic
  5. Constraints with respect to the date of your presentation
     - Do not write when you want to present, only when you cannot

TA: Andrea Merlina (andremer@ifi.uio.no)