Ali Utkan Şahin

utkn.github.io · asahin17@ku.edu.tr · +905359802097

Research Interests

Distributed systems, cryptography, privacy & security.

Education

Koç University – Istanbul, Turkey — Sep 2017 – ongoing
- BSc in Computer Engineering
- Current GPA: 3.88/4.00 (top 10%)
- Expected graduation: June 2021

Nanyang Technological University – Singapore — Aug 2019 – Dec 2019
- Exchange semester as part of the Global Exchange mobility program.

Projects

Cryptocurrency Social Media Analysis - Koç University — Feb 2021 – ongoing
- Currently working on cryptocurrency speculation detection and price prediction through social media analysis using natural language processing and regression models.

Privacy-Preserving Federated Learning Systems - Koç University — Sep 2020 – Jan 2021
- Worked on the evaluation of homomorphic encryption and secure multiparty computation solutions for privacy-preserving federated learning.

Research Experience

Secure Routing in DHTs – Koç University — Jul 2020 – Dec 2020
- Surveyed the Byzantine fault tolerant routing protocols for DHTs.
- Collaborated on the write-up and supervised the implementation.

Open-Source Skip Graph Middleware – Koç University — Jul 2020 – Oct 2020
- Collaborated with other undergraduate research assistants on the implementation of an open-source skip graph middleware.
- Worked on node-to-node communication, concurrent insertion support, and name ID lookups.

Universal Fog Proxy – Koç University & National Chiao Tung University — Mar 2020 – Nov 2020
- Surveyed authentication protocols, designed message flows.
- Implemented the solution, constructed the testbed, and performed experiments.
- Collaborated on the write-up.

Authenticated Lookups Over Skip Graphs – Koç University — Aug 2019 – Jul 2020
- Implemented an identity-based threshold digital signature scheme.
- Implemented a protocol that aims to provide fault-detection against routing attacks.
- Deployed my implementation on AWS and took measurements that relate to the overhead introduced by the protocol.

SkipSim Consensus Simulation – Koç University — Mar 2019 – Jul 2019
- Worked on the development of SkipSim skip graph simulator.
- Implemented the consensus and the view layers LightChain blockchain architecture on SkipSim.
- Took various measurements related to the safety and liveliness under churn.

LightChain Skip List Simulation – Koç University — Nov 2018 – Mar 2019
- Studied blockchains, skip lists, and skip graphs.
- Implemented a lightweight skip list simulator that supports churn and replication.
- Simulated the executions of the consensus layer of LightChain blockchain architecture.
- Took various measurements related to the safety and liveness under churn.

Teaching Experience

COMP416: Computer Networks – Koç University Oct 2020 – Feb 2021

- Worked as a teaching assistant for the graduate-level Computer Networks course. Prepared and evaluated projects, conducted demo sessions, provided homework solutions, and gave one-to-one tutoring sessions to the students struggling with the material.

Work Experience

Internship (Remote) – DapperLabs, Vancouver, Canada Jul 2019 – Nov 2019

- Worked on gossip protocols, their implementation, and their evaluation on a simulator that I developed. The simulator supports custom topologies, malicious peers, static & dynamic fanout, pull & push protocols, custom latency functions, clusters, stateful scenarios that can be replayed, and custom experiments.

Papers

[1] A. Ali, A. U. Şahin, Ö. Özkasap, and Y. Lin. The universal fog proxy: A third-party authentication solution for federated fog systems with multiple protocols. Manuscript submitted for publication, 2021.

[2] S. Taheri-Boshrooyeh, A. U. Şahin, Y. Hassanzadeh-Nazarabadi, and Ö. Özkasap. Demo: A proof-of-concept implementation of guard secure routing protocol. In *2020 International Symposium on Reliable Distributed Systems (SRDS)*, pages 332–334, 2020.

[3] Y. Hassanzadeh-Nazarabadi, N. Nayal, S. S. Hamdan, A. U. Şahin, Ö. Özkasap, and A. Küpçü. Demo: Skip graph middleware implementation. In *2020 International Symposium on Reliable Distributed Systems (SRDS)*, pages 335–337, 2020.

[4] Y. Hassanzadeh-Nazarabadi, A. U. Şahin, Ö. Özkasap, and A. Küpçü. Skipsim: Scalable skip graph simulator. In *2020 IEEE International Conference on Blockchain and Cryptocurrency (ICBC)*, pages 1–2, 2020.

Awards

DFINITY 2019 Scholarship – Zürich, Switzerland 2019

- Proposed an offline and scalable blockchain simulator.
- Received a scholarship in the context of the 2019 DFINITY Scholarship Program at the undergraduate level in which proposals are selected on their contribution to the goal of a public decentralized cloud.

Vehbi Koç Scholar – Istanbul, Turkey

- Awarded in Fall 2017, Spring 2018, Fall 2018, and Spring 2019 for maintaining high academic performance.