Ali Utkan Şahin

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Research Interests

Distributed systems, networks, cryptography, privacy & security.

Education

Koç University – Istanbul, Turkey. Sep 2017 – ongoing
- BSc in Computer Engineering
- Advisor: Öznur Özkasap
- Current GPA: 3.88/4.00
- Expected graduation: June 2021

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

American Robert College – Istanbul, Turkey. 2012 – 2017
- High school diploma.

Research Experience

Secure Routing in DHTs – Koç University. Jul 2020 – ongoing
- We are developing a Byzantine fault tolerant routing protocol for DHTs.
- Surveyed the existing solutions.
- Currently collaborating on the write-up and supervising the implementation.

Open-Source Skip Graph Middleware – Koç University. Jul 2020 – Oct 2020
- Collaborated with other undergraduate research assistants.
- 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
- Studied digital signatures.
- 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
- Studied skip graphs.
- 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 liveness under churn.

LightChain Skip List Simulation – Koç University. Nov 2018 – Mar 2019
- Studied blockchains and skip lists.
- 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 – ongoing
- Working as an undergraduate teaching assistant for the course. Preparing and evaluating projects, conducting demo sessions, providing homework solutions, and giving one-to-one tutoring sessions to the students struggling with the material.

Work Experience

Internship (Remote) at DapperLabs – Vancouver, Canada   Jul 2019 – Nov 2019
- Worked on gossip protocols, their implementation, and their evaluation on a simulator that I have 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, 2020.

[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 / Honors

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.