Ali Utkan Şahin

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Research Interests

Distributed systems, fault-tolerance, networks, cryptography, security.

Education

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

Nanyang Technological University – Nanyang, 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

Universal Fog Proxy   Mar 2020 – ongoing
- Working as an undergraduate research assistant at a joint research project with Prof. Öznur Özkasap (Koç University) and Prof. Ying-Dar Lin (National Chiao Tung University).
- Surveyed the authentication protocols used in fog networks, designed message flows, implemented the solution and performed experiments.
- Currently collecting results and collaborating on the write-up of our paper.

Secure Routing on DHTs – Koç University.   Jul 2020 – ongoing
- Collaborating with Dr. Yahya Hassanzadeh-Nazarabadi at DISNET (Distributed Systems and Reliable Networks Laboratory), Koç University.
- Surveyed the literature on secure routing protocols for DHTs.
- Currently aiding on the construction of the security proofs and implementing the protocol.

Open-Source Skip Graph Middleware – Koç University.   Jul 2020 – Oct 2020
- Collaborated with other undergraduate research assistants lead by Dr. Yahya Hassanzadeh-Nazarabadi at DISNET.
- Implemented a concurrent insertion protocol with 2-round consensus.

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

LightChain Consensus Simulation – Koç University.   Mar 2019 – Jul 2019
- Studied blockchain consensus and skip graphs.
- Worked on the development of SkipSim, an open-source scalable skip graph simulator.
- Implemented the consensus layer of LightChain blockchain architecture on SkipSim.
- Took various measurements that relate to the safety, liveliness and replica availability that is provided by the protocol.

Hypergeometric Distributions Over Skip Lists – Koç University.   Nov 2018 – Mar 2019
- Studied skip lists and churn.
- Implemented a lightweight skip list simulator that supports churn and replication.
- Conducted hypergeometric experiments and took various measurements regarding the safety, liveliness and replica availability under churn.

Teaching Experience

COMP416: Computer Networks – Koç University. Oct 2020 – ongoing
  · Acting as an undergraduate teaching assistant for the course. Preparing and evaluating projects, supervising demo sessions, providing homework solutions and giving one-to-one tutoring sessions to students struggling with the material.

Work Experience

Internship (Remote) at DapperLabs – Vancouver, Canada Jul 2019 – Nov 2019
  · Worked on gossip protocols, their implementation and evaluation on a simulator that I have developed from scratch. 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. The simulator is currently being used internally by the company.

Conference Demos

A Proof-of-Concept Implementation of Guard Secure Routing Protocol. Sanaz Taheri, Ali Utkan Şahin, Yahya Hassanzadeh, Öznur Özkasap. *IEEE Symposium on Secure and Reliable Distributed Systems*. (September 2020)

The Skip Graph Middleware Implementation. Yahya Hassanzadeh, Nazir Nayal, Shadi Hamdan, Ali Utkan Şahin, Öznur Özkasap, Alptekin Küpçü. *IEEE Symposium on Secure and Reliable Distributed Systems*. (September 2020)

SkipSim: Scalable Skip Graph Simulator. Yahya Hassanzadeh, Ali Utkan Şahin, Öznur Özkasap, Alptekin Küpçü. *IEEE International Conference on Blockchain*. (May 2020)

Awards / Honors

DFINITY 2019 Scholarship – Zürich, Switzerland. 2019
  · Received scholarship in the context of 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, Spring 2019, and Spring 2020 for maintaining high academic performance.