CV :/ / Ali Utkan Şahin

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Research Interests

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

Education

- **Koç University**, *Istanbul – Turkey*. (September 2017 – ongoing, expected graduation: June 2021)
  BSc, *Computer Engineering*.
  Current GPA: 3.88/4.0
- **Nanyang Technological University**, *Singapore*. (August 2019 – December 2019)
  Exchange student, *Computer Engineering*.
- **American Robert College**, Istanbul – Turkey. (2012 – 2017)
  High school diploma

Research Experience

- **Fog to Fog Federation,** *Koç University & National Chiao Tung University*. (March 2020 – ongoing)
  Working on the fog to fog federation problem, where a user needs to authenticate itself to a foreign fog service with an authentication server residing at the home fog. Initially, I have surveyed the authentication protocols used in fog networks. Currently, I am designing message flows and implementing the solution.
- **Byzantine Fault Tolerant Routing on Skip-Graphs**, *Koç University*. (July 2020 – ongoing)
  Recently started collaborating on a project where we aim to provide Byzantine fault tolerant routing on skip-graphs. Our protocol will also provide resilience against Sybil & churn attacks.
- **Authenticated Lookups on Skip-Graphs,** *Koç University*. (August 2019 – July 2020)
  Studied digital signatures and implemented an identity-based threshold digital signature scheme from a reference paper. Realized the first ever implementation of a protocol that aims to provide fault-detection against routing attacks over skip-graphs. Deployed my implementation on AWS and took various measurements.
- **Consensus Simulation,** *Koç University.* (March 2019 – July 2019)
  Studied consensus and skip-graphs. Performed crucial bug fixes and implemented new mechanisms on SkipSim, an open-source scalable skip-graph simulator. Implemented the consensus layer (i.e. Proof-of-Validation) 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*. (November 2018 – March 2019)
  Studied skip-lists and related algorithms. Studied churn and its modeling as a Weibull distribution. 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.

Conference Demos / Presentations

- **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, to be presented)
- **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)

Work Experience

- **Intern (Remote)**, *DapperLabs, Vancouver – Canada*. (July 2019 – November 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. It is currently being used internally by the company.

Awards / Honors

- **DFINITY 2019 Scholarship,** *DFINITY, 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,** *Koç University, Istanbul – Turkey*.
  Awarded in Fall 2017, Spring 2018, Fall 2018 for maintaining 3.5+ SPA.