

Ahmed Alquraan

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EDUCATION

PhD, Computer Science, University of Waterloo — Jan. 2019 – Jan. 2024 (Expected)

- Part of Waterloo Advanced Systems Lab (WASL). Supervised by Prof. Samer Al-Kiswany.
- GPA: 96/100 (A+).

MMath, Computer Science, University of Waterloo — Sep. 2017 – Dec. 2018

- Part of Waterloo Advanced Systems Lab (WASL). Supervised by Prof. Samer Al-Kiswany.
- Thesis Title: An Analysis of Network-Partitioning Failures in Cloud Systems.
- GPA: 90.5/100 (A+).

B.Sc, Computer Engineering, University of Jordan — Sep. 2010 – Jan. 2015

- Supervisor: Prof. Iyad Jafar
- Thesis Title: Design and Implementation of A RISC ISA for Modular Arithmetic on FPGA
- GPA: 3.81/4.0 (A+ with Honors, First on the graduating class)

AWARDS AND HONORS

IBM PhD Fellow	Apr. 2021	-----
Facebook Fellowship Finalist	Apr. 2021	-----
Huawei Prize for Best Research Paper	Apr. 2019	\$4000
David R. Cheriton Graduate Scholarship - UWaterloo	Jan. 2019 – Jan. 2021	\$20,000
OSDI'18 Travel Award	Oct. 2018	\$1000
University of Jordan Award for Academic Excellence	Sep. 2010 – Jan. 2015	-----

PUBLICATIONS

- [1] “Toward a Generic Fault Tolerance Technique for Partial Network Partitioning, Mohammed Alfatafta, Basil Alkhatib, Ahmed Alquraan, Samer Al-Kiswany, Symposium on Operating Systems Design and Implementation (**OSDI'20**), 2020
- [2] “Scalable, Near-Zero Loss Disaster Recovery for Distributed Data Stores, Ahmed Alquraan, Alex Kogan, Virendra Marathe, Samer Al-Kiswany, Very Large Data Base Endowment (**VLDB'20**), Sep. 2020
- [3] “FLAIR: Accelerating Reads with Consistency-Aware Network Routing, Hatem Takruri, Ibrahim Kettaneh, Ahmed Alquraan, Samer Al-Kiswany, Symposium on Networked Systems Design and Implementation (**NSDI'20**), Feb. 2020 (**acceptance rate: 18%**)
- [4] “The Network-Integrated Storage System”, Ibrahim Kettaneh, Ahmed Alquraan, Hatem Takruri, Suli Yang, Andrea C. Arpaci-Dusseau, Remzi H. Arpaci-Dusseau, Samer Al-Kiswany, in IEEE Transactions on Parallel and Distributed Systems (**TPDS**), Sep. 2019.
- [5] “An Analysis of Network-Partitioning Failures in Cloud Systems”, Ahmed Alquraan, Hatem Takruri, Mohammed Alfatafta, Samer Al-Kiswany, Symposium on Operating Systems Design and Implementation (**OSDI'18**), Oct. 2018 (**acceptance rate: 17%**).

PROJECTS

Slogger: Scalable, Near-Zero Loss Disaster Recovery for Distributed Data Stores (VLDB'20)

- Designed a new disaster recovery mechanism for distributed data stores with tiny data loss window.
- Leveraged the synchronized clocks to guarantee the consistency of the backup site state.
- Integrated the new mechanism with LogCabin (a key-value store based on Raft).
- Wrote a TLA+ specifications to ensure the correctness of the mechanism.
- **Utilized:** Synchronized clocks, TLA+, C++, Socket programming, Protocol buffers.

FLAIR: Accelerating Reads with Consistency-Aware Network Routing (NSDI'20)

- Designed a new consensus protocol to allow followers to safely serve read operations.
- Leveraged the programmable switches to perform consistent in-network request routing.
- Integrated the protocol with LogCabin (a key-value store based on Raft).
- Wrote a TLA+ specifications to ensure the safety of the protocol.
- **Utilized:** Programmable switches (P4), TLA+, C++, Socket programming, Protocol buffers.

NEAT: Impact of Network Partitioning Failures on Distributed Systems (OSDI'18)

- A thorough analysis of more than 120 network-partitioning failures in 25 distributed systems.
- Dissected the fault-tolerance module of these systems to identify the root cause of failures.
- Built NEAT, a network partitioning testing framework that leverages OpenFlow and iptables.
- **Utilized:** Java, Socket programming, SDN, OpenFlow, iptables, JIRA.

EXPERIENCE

Research Intern — May. 2019 – Aug. 2019

Oracle Labs, Burlington, MA, USA — Collaborators: Dr. Virendra Marathe & Dr. Alex Kogan
I joined the distributed systems group at Oracle Labs where I worked on designing a novel disaster recovery system for distributed data stores. This work was published in VLDB'20.

Research Assistant — Sep. 2017 – Present

University of Waterloo, ON, Canada — Collaborators: Prof. Samer Al-Kiswany & WASL members
At the Waterloo Advanced Systems Lab, I am involved in multiple projects:

- An analysis of network partitioning failures in modern cloud systems (OSDI'18, OSDI'20).
- Exploiting network programmability to accelerate strongly-consistent key-value stores (NSDI'20).
- Exploiting synchronized clocks to build a near-zero loss disaster recovery system for distributed data stores (VLDB'20).

Teaching Assistant — Sep. 2017 – Present

University of Waterloo, ON, Canada

- I worked as a teaching assistant at the University of Waterloo for CS241: Foundations of sequential programs, CS343: Concurrent and Parallel Programming courses, and CS436/636: Distributed Computer Systems.
- I mentored undergraduate students while they worked on a research-based long-term projects.

Software Developer — Jul. 2014 – Sep. 2017

JoVision, Amman, Jordan — Collaborator: Dr. Islam Shdaifat

Working on multiple projects that involves the following technologies:

- Image processing and analysis (openCV-C++).
- Internet of things and embedded systems (Raspberry Pi | Arduino | Sensors | Actuators).

SERVICES

- Program committee member of the JSys (Journal of Systems Research) Student Editorial Board (2021)
- Program committee member for the International Conference on Software Defined Systems (SDS'19 and SDS'20)
- Program committee member for the International Conference on Information and Communication Systems (ICICS'19, ICICS'20, and ICICS'21)

VOLUNTEERING

Maintaining WASL website — Sep. 2019 – Present

I am the maintainer of the Waterloo Advanced Systems Lab website (<https://wasl.uwaterloo.ca/>).

Coordinating WASL weekly seminar — May. 2018 – Aug. 2018

I coordinated and organized the weekly seminar of the Waterloo Advanced Systems Lab. This involved selecting the topics and published papers to be discussed during the seminar.

Instructor for tutoring lectures — 2012 – 2015

During my senior undergraduate years, I joined an initiative to provide tutoring lectures to fellow students. During this period I prepared and instructed tutoring sessions related to several courses, including object oriented programming, data structures and algorithms, and computer architecture and design.