

SHAYAN HOSSEINI

X410D 2366 Main Mall, Vancouver, BC Canada V6T 1Z4
+1-604-841-1112 ♦ seshayanh@gmail.com ♦ <https://shayanh.com/>

EDUCATION

University of British Columbia, Vancouver, BC, Canada 2021 - present

M.Sc. in Computer Science

Research topics: I have been working broadly on distributed systems. My main research project has been building correct distributed systems using lightweight formal methods. I enjoy exploring different abstractions for making distributed systems better.

University of Tehran, Tehran, Iran 2015 - 2020

B.Sc. in Computer Engineering

Thesis: Verification of Microservices

PUBLICATIONS

Compiling Distributed System Models with PGo ASPLOS 2023

Finn Hackett, *Shayan Hosseini*, Renato Costa, Matthew Do, and Ivan Beschastnikh

28th ACM International Conference on Architectural Support for Programming Languages and Operating Systems

RESEARCH EXPERIENCE

Research Assistant at the University of British Columbia, Vancouver, BC, Canada 2021 - present

Advisor: Ivan Beschastnikh

- Building PGo project, a compiler for building correct distributed systems. PGo compiles verified models of distributed system models into implementations in Go.
- Created a distributed runtime library that provides the same model-level semantics on the implementation-level by employing distributed transactions and dependency injection.
- Made a verified distributed key-value store based on the Raft protocol by using PGo. Improving state-of-the-art 3× on development effort and 40% on throughput.
- Built verified eventually consistent systems such as Conflict-free Replicated Data Types by using PGo.

Research Intern at Microsoft Research Remond, Remote Summer 2022

Advisors: Behnaz Arzani and Dan Crankshaw

- Designed a system for automatic mitigation of faulty datacenter links by helping datacenter operators fixing the most critical links first.
- Improved failures of Azure's automatic mitigation of faulty datacenter links by 13% based on the simulation results.

Research Intern at Max Planck Institute for Informatics, Saarbrücken, Germany Summer 2019

Advisor: Christoph Lenzen

- Researching to make routing algorithms fault-tolerant by using an augmentation process. Showed the lower bound for the minimum number of edges and vertices in the resulting augmented graph.

AWARDS AND HONORS

ICPC, International Collegiate Programming Contest

The International Collegiate Programming Contest is the most prestigious programming contest for college students.

- **World Finalist** in the 41th ICPC World Finals, South Dakota, USA 2017
Top 0.3% among more than 45,000 students from all over the world.

- **3rd team** in ICPC Pacific Northwest Regional Contest 2021
Among more than 100 teams participating from the area of Pacific Northwest.

- **3rd, 2nd, 2nd team** in ICPC West Asia Region Regional Contest, respectively in 2018, 2017, 2016.
Top 1% among more than 300 teams that participate in this contest every year.

Silver Medal in the 24th Iranian National Olympiad in Informatics 2014
Top 0.16% in the algorithmic programming contest among 10,000 participants in the country.

PROFESSIONAL EXPERIENCE

Software Engineering Manager at Cafe Bazaar, Tehran, Iran 2020

- Leading a team of 10 people working to integrate all public cloud services into a unified product.
- Built a billing system to automatically charge users for their usage of the services.
- Built a monitoring and alerting system that allowed users to monitor their resources in the cloud.

Technical Lead and Product Manager at Cafe Bazaar, Tehran, Iran 2017 - 2019

- Co-founded and led a team of 8 engineers to provide highly available and scalable cloud service to other technical teams and companies (later rebranded as Sotoon).
- Started and developed a distributed object storage service using Ceph. This service serves more than 50 TB of data and responds to more than hundreds of requests per second in production.
- Scaled our existing content delivery network 50% by developing a new architecture using cache servers.
- Designed and developed a new software architecture for the CDN nodes to be dynamically configurable and multi-tenant.

Software Engineer at Cafe Bazaar, Tehran, Iran 2015 - 2017

- Developing Cafe Bazaar back-end codebase with more than 100,000 lines of Python code and 30 million users.
- System owner of Cafe Bazaar CDN and parts of the back-end. Managing these systems on more than 15 servers.
- Responsible for code reviews and system maintenance.

TEACHING EXPERIENCE

Teaching Assistant

University of British Columbia

- CPSC 416: Distributed Systems, Ivan Beschastnikh Spring 2021

University of Tehran

- **Head TA**, Design and Analysis of Algorithms, Hamid Mahini 2018 - 2019
- Engineering Probability and Statistics, Behnam Bahrak Fall 2018, 2019

Informatics Olympiad and ICPC

Teaching topics in computer science including algorithms, data structures, and graph theory to undergraduate students preparing for ICPC as well as high school students preparing for Informatics Olympiad.

- University of Tehran 2017
- Iranian National Olympiad in Informatics Summer Camp 2015
- Allameh Helli High School 2015

PROJECTS

Tracing Library

A light-weight library for manual distributed system tracing. Has been used for precise automatic grading in the CPSC 416 course.

gRPC Go Contracts

A design by contract library for the gRPC Go framework for runtime verification of microservices communication.

Peydaa

Peydaa is a non-profit platform to make transparency in the Iranian job market. Peydaa is a website that people can anonymously share their salary and experience of working in companies with others. More than 1000 users have shared their salaries and experiences on Peydaa.

TALKS

Compiling Distributed System Models Into Implementations with PGo

- Microsoft Research, Networking Research Group November 2022
- TLA+ Conference September 2022
- AWS Automated Reasoning Group February 2022
- University of British Columbia February 2022