Amir Makhshari

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Education

The University of British Columbia (UBC)

MASc. in Computer Engineering — *Sep 2019 - Aug 2021*

- GPA: **4.22/4** - Graduation date: **August 2021**
- Thesis: *IoT Bugs and Development Challenges* - Published in main technical track of ***ICSE'21: Top Conference in Software Engineering.***

Amirkabir University of Technology

B.S. in Computer Engineering — *Aug 2014 - Mar. 2019*

- GPA (last two years): **3.97/4**
- Thesis: *StressThing*: **API testing framework** for load & stress testing APIs with supports for **+1000 concurrent users and +10,000 concurrent requests**.

Work Experience

Software Analysis and Testing Lab @UBC - Intel Corporation

Software Engineering Researcher — *Sep 2019- Aug 2021*

- Proposed a bug taxonomy for IoT with Root Cause Analysis of 323 IoT Bugs and a systematic characterization of IoT development challenges by communicating with more than 200 IoT developers with different expertise from all over the world (published in **ICSE'21** - in partnership with **Intel** corporation)
- Designed a system for **automated test case generation** for cloud-based IoT systems using **Java** Groovy by static analysis of IoT rules specification (**AWS IoT**).

Computer Science Department @UBC

Software Engineering Teaching Assistant — *Sep 2020- Aug 2021*

- *CPSC 455*: Mentoring students in **full-stack Javascript web development**: frontend in **React**, back-end API in **Express**, NoSQL DB with **MongoDB**, and **CI&CD**.
- *CPSC410*: Directed five groups in developing source code analysis tools, applying **Java design patterns**, and designing domain-specific languages all in **Java**.
- *CPSC319*: Directed two large groups by consistent **design/code review** throughout developing a **full-stack Javascript** email service system following an SDLC method using **AWS**: Amplify, DynamoDB, SES, S3. Clarified requirements by regular communication with **HSBC bank stakeholders**.

Amirkabir University of Technology

Software Engineer — *Jul 2018- Aug. 2019*

- As a PHP **back-end developer**, contributed to architecture of a client-faced **IoT SaaS platform** with **+100 micro-services**. Improved user password validation, enhanced **API error handling** by launching centralized universal error code, and improved backend maintainability by adding **API event logging**.
- Improved MTTF by 37% by solving known bugs in the permission system by **fixing data schema flaws** that improved backend extensibility for new user types.
- Successfully passed **concurrency+load** tests with 5000 concurrent nodes via improving **container resource allocation** for IoT nodes, and **message queuing**.

Electronic Research & Production Co. TAKTA

Software Engineer — *Sep 2017- Jun. 2018*

- Reduced in-person device monitoring time by 90% by developing a **full-stack IoT**-based remote monitoring platform with **JavaScript** server, **cloud-based messaging**, and **React Native** app. Reduced deployment time from 10 days to 1 day by utilizing TDD throughout the project using real on-site devices.
- Clarified vague requirements, and planned/prioritized them by weekly **agile** meetings with up to 10 engineers and managers. Consistent scrum meetings with hardware engineering team (weekly), IoT team (daily) to design/execute test cases that caused meeting 100% of critical and 65% of stretch requirements.

Alton Tech. Co.

Software Engineer Intern — *May 2017- Sep. 2017*

- With no prior background in iOS, built an **iOS application** using **Swift**, to control smart IoT lightning devices remotely. Resulted in a 16% saving on electricity.
- Worked closely with the project supervisor and the back-end team to **design APIs** in **Java**, that allow other developers to query smart IoT lightning devices.

Side Projects (Link)

GNN4Code — *Python*

Automatic Bug Detection Tool using **Machine Learning** | **Group** project — *2021*

- This tool builds graph models of the source code for **Graph Neural Networks** and achieves **80.13% bug detection accuracy** on a dataset of **150,000 Javascript code snippets**. This tool is compatible with GCN, GAT, and RGCN models and supports both homogeneous and heterogeneous graph structures.

StressThing — *JavaScript*

Backend API Testing Tool | **Thesis** project — *2019*

- A web-based backend **API testing tool** that uses Apache JMeter and BlazeMeter to evaluate the **reliability of backend services** by stress and load testing.

ShareBill — *JavaScript*

Fintech **Backend and Infrastructure**| University **Startup** — *2017*

- Led the backend design & implementation with special focus on centralized error management, **backward compatibility** support, **Data schema design** with support for **DB caching** using Redis, One Time Password (**OTP**) for user login, API **token management** for third-party access, and Swagger API documentation.

Skills

Programming — **Expert:** Java **Proficient:** JavaScript • PHP • Python **Familiar:** C/C++ • BASH • R • Swift

Technologies — Git • CI/CD • AWS • Object-Oriented Design • RESTful APIs • Design Patterns • Functional Programming • Algorithms and Data Structures • SQL/NoSQL • Distributed Systems • API/Android Testing • Test-Driven Development • System Design and Architecture