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*: **Cloud-based** testing framework for **load & stress testing** IoT 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)
- Developed an **automated test case generation** for IoT using **Java** Groovy by static analysis of smartApps. Experimented on **AWS IoT**, and SmartThings.

Computer Science Department @UBC

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

- *Software Engineering Industry Skills (CPSC 455)*: Mentoring students during interactive web development workshops and labs about front-end development in **React.js**, back-end API development in **Express.js**, NoSQL design with **MongoDB**, and **CI & CD**.
- *Advanced Software Engineering (CPSC410)*: Directed five groups in developing source code analysis tools, applying **Java design patterns**, and designing domain-specific languages all in **Java**. Resulted in high course satisfaction and led the course most outstanding project.
- *Software Engineering Projects(CPSC319)*: Directed two large groups by consistent **design/code review** throughout developing an 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 MTTF by 37% by solving known bugs in the permission system. Improved the maintainability/ extensibility of event logging and API error handling by launching universal error codes.
- 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.

DroidCov — *BASH, Java*

Android Test Automation Tool | **Group** project — *2020*

- It automatically configures and runs testing tools (Facebook Sapienz, Google Monkey, APE) with Android apps and measures **instruction/method coverage**.

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

Honors & Awards

2021 **Vice-President of Social Relations,** Elected by ECE students as a member of Graduate Student Society

2019 **UBC Graduate Fellowship,** Granted by ECE department at UBC and funded by Intel co.

2014,2018 **Ranked top 1%,** National-wide University Entrance Exam for M.Sc. (CE, IT) and B.Sc. (Eng., Foreign lang.)