

# Amir Makhshari

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## Education

### The University of British Columbia (UBC)

Vancouver, Canada

MASC. IN COMPUTER ENGINEERING

Sep 2019 - Aug 2021

- GPA: **4.15/4** - 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, Tehran Polytechnic (AUT)

Tehran, Iran

B.S. IN COMPUTER ENGINEERING

Aug 2014 - Mar. 2019

- GPA (last two years): **3.97/4**
- Thesis: *StressThing*: A web-based testing framework for **load and stress testing** IoT with supports for >1000 concurrent users and >10,000 concurrent requests.

## Work Experience

### Software Analysis and Testing Lab @UBC - Intel Corporation

Vancouver, Canada

SOFTWARE ENGINEERING RESEARCHER

Sep 2019- Present

- 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

Vancouver, Canada

SOFTWARE ENGINEERING TEACHING ASSISTANT

Sep 2020- Present

- 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 desing with **MongoDB**, and **CI & CD**.
- Advanced Software Engineering (CPSC410)*: Directed five groups in developing source code analysis, tools, applying **Java design patterns**, and developing 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.

### IoT Lab at AUT

Tehran, Iran

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.
- Worked closely with the clients and the IoT core team to successfully pass the **concurrency and load** testing by handling 5000 concurrent nodes with no error.

### Electronic Research & Production Co. TAKTA

Tehran, Iran

SOFTWARE ENGINEER

Sep 2017- Jun. 2018

- Reduced in-person device monitoring time by 90% by developing a **full-stack IoT**-based remote monitoring platform using **JavaScript** for server and **React Native** for mobile 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 team-work with hardware engineering team, and daily scrum meetings with the IoT team to design and evaluate new test cases.

### Alton Tech. Co.

Tehran, Iran

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 various testing tools (Sapienz, Google, APE) on a set of Android apps and measures **instruction and 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

Vancouver, BC

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

Vancouver, BC

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

Iran