

FOROUGH MEHRALIAN

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Education

Ph.D. in Software Engineering | *University of California, Irvine; GPA: 3.94/4* Sep 2018 - Dec 2023
M.Sc. and B.Sc. in Software Engineering | *Sharif University of Technology, Iran* Sep 2011- Sep 2015 & Sep 2015 - Jan 2018

Work Experience

Graduate Research Assistant,

Software Engineering and Analysis Lab, UC Irvine, California

Jun 2019 - Present

- Co-First author of Oversight, an automated approach to detect over accessibility issues. [Accepted at ASE'22]
 - Defined the problem of over accessibility, highlighting its potential negative impact on security, accessibility, and workflow violation.
 - Leveraged a variety of static and dynamic analysis techniques to detect and address over-accessibility issues in different types of apps.
- Co-First author of GroundHog, an automated accessibility crawler for mobile apps. [Accepted at ASE'22]
 - Leveraged virtualization to preform repeatable actions in specific app states with various assistive technologies.
 - Conducted extensive testing and evaluation of GroundHog using a wide range of mobile apps, demonstrating its ability to identify critical accessibility issues.
- First author of COALA, context-aware label generation approach for icons in Android apps. [Accepted at FSE'21]
 - Led a group project to improve app accessibility by proposing an automated repair approach for missing icon labels.
 - Customized and implemented an advanced encoder-decoder architecture using PyTorch to learn icon labels in their context, enabling the generation of accurate and relevant labels for a wide range of icons in Android apps.
 - Improved accuracy of the prior context-agnostic model by 30% in predicting correct labels for unlabeled icons.
- Cooperated in ACETON, automated construction of energy test oracles in Android. [Accepted at FSE'20]
 - Proposed and implemented a novel deep learning-based test oracle for energy defects in Android using PyTorch.
 - Developed and applied an attention mechanism in the model to improve its explainability and localize energy defects during the test, enabling developers to understand the root cause of the defects.

Software Engineer,

Candelis Inc., Newport Beach, California

Jun 2021 - Sep 2021, Jan 2022 - Sep 2022

- Designed and implemented the DICOMWeb standard, enabling web-based access to DICOM data. This involved developing the Store, Retrieve, and Query APIs as a new service, and integrating them with the company's 15-year-old source code.
- Implemented a cost-efficient archive and backup mechanism for the DICOM data using various Amazon S3 storage classes. This involved designing a data lifecycle management strategy and utilizing Amazon S3's Intelligent-Tiering and Glacier storage classes to optimize storage costs.
- Integrated Prometheus for time-series monitoring of key performance metrics and utilized Grafana to visualize the data and gain insights into the system behavior.

Software Engineer,

Café Bazaar, Tehran, Iran

Jun 2018 - Aug 2018

- Developed a micro-service using Django for Bazaar, Iran's largest app store with over 40 million users, to display ads on their search page. Utilized Docker and Kubernetes for containerization and orchestration of the micro-service, respectively.
- Migrated the previous Redis database to PostgreSQL and optimized the queries to ensure improved performance and scalability.
- Implemented a Second-bid auction strategy for the advertisements and conducted beta testing of the service.

Graduate Research Assistant,

Automated Software Engineering Lab, Sharif University of Technology, Tehran, Iran

Sep 2016 - Jan 2018

- Designed an automated approach for recommending feature changes to the developers by analyzing user expectations from user reviews in app stores.
- Developed various regression and classification techniques in Java using CoreNLP to rank user-recommended features.

Researcher/Consultant,

Avan Software Technology Advisors (ASTA), Tehran, Iran

Sep 2015 - Dec 2017

- Worked remotely with a team consisting of 2 senior software engineers and a faculty member to support Javacup, the largest non-profit community of Iranian Java Developers. Collaborated on efforts to increase user engagement, resulting in a 20,000-point improvement in the website's Alexa rank.

Android Developer,

Behsa Information Technology Advisors, Esfahan, Iran

Jun 2014 - Sep 2014

- Developed an Android application for the Municipality of Isfahan to streamline taxi inspections.
- Designed and implemented a REST API to efficiently retrieve drivers' information from the server, utilizing the lazy loading technique for optimized communication.

Publications

F. Mehralian *, N. Salehnamadi*, and S. Malek. "Too Much Accessibility is Harmful! Automated Detection and Analysis of Overly Accessible Elements in Mobile Apps" In *Proceedings of the 37th IEEE/ACM International Conference on Automated Software Engineering (ASE)*, 2022

N. Salehnamadi*, **F. Mehralian***, and S. Malek. "Groundhog: An Automated Accessibility Crawler for Mobile Apps." In *Proceedings of the 37th IEEE/ACM International Conference on Automated Software Engineering (ASE)*, 2022

F. Mehralian, N. Salehnamadi, S. Malek. "COALA: Context-Aware label generation for icons in Android apps" In *Proceedings of the 2021 15th Joint Meeting on Foundations of Software Engineering (ESEC/FSE)*, 2021.

R. Jabbarvand, **F. Mehralian**, and S. Malek. "Automated Construction of Energy Test Oracle for Android" In *Proceedings of the 2020 14th Joint Meeting on Foundations of Software Engineering (ESEC/FSE)*, 2020.

Honors and Awards

Awarded a \$1.2M grant from National Science Foundation to work toward Software Accessibility Testing.

Recipient of the SIGSOFT CAPS travel award to attend **International Conference on Software Engineering**, Pittsburgh, 2022

Recipient of the NSF travel award to attend **Automated Software Engineering** conference, San Diego, 2019

Recipient of the full scholarship to attend **Grace Hopper Celebration of Women in Computing**, Florida, 2019

Recipient of **Chair's Award** at University of California, Irvine, 2018

Recognized as an **Exceptional Talented MSc Student** and has been invited to the PhD interview without exam, 2017

Recipient of **National Elites Foundation** scholarship, 2016-2017

Recognized as an **Exceptional Talented BSc student** and has been offered graduate admission to Sharif University of Technology without exam, 2015

Recipient of the grant and membership of Iran's **National Elites Foundation**, 2012

Ranked 126th in nationwide university entrance exam for BSc among more than 300,000 students, 2011

Member of the **National Organization for Development of Exceptional Talents (NODET)**, 2004-2011

Skills

Programming Languages: Java, Python, C/C++, Android

Database: PostgreSQL, SQLite, MySQL, Redis

Technologies and Frameworks: Django, Matlab, Keras, PyTorch, Docker, Kubernetes

Software Engineering: Agile and RUP methodologies, Software Testing, Object Oriented Design and Patterns, Program Analysis

Selected Projects

Modularization of EqualsVerifier: Migrating an open-source project from Java 8 to Java 9

Handwritten Digit recognizer: MATLAB implementation of several Machine Learning classifiers for detecting handwritten digits

Knowledge Management System: Defining and documenting requirements of a knowledge management system using RUP methodology and implementing it in Java

Pomodoro: UI design and backend implementation of an Android application to manage daily tasks using a time management method called Pomodoro

Book Search Engine: An information retrieval system used for book searching written in Java using Lucene

Online Store Website: An online store website implemented using Python and Django framework

Numerical Methods: A graphical MATLAB application developed supporting over 20 numerical algorithms

Volunteering & Service

Sighted guide at 38th Annual CSUN Assistive Technology Conference 2023

Member of live virtualization team at International Conference on Software Engineering (ICSE) 2020

Peer reviewer of International Conference on Mobile Software Engineering and Systems (MobileSoft`21)

External reviewer of International Conference on Software Architecture (ICSA`22)