

# FOROUGH MEHRALIAN

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<https://fmehralian.github.io>

## EDUCATION

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Ph.D. in Software Engineering - <i>University of California, Irvine, USA</i>	Sep 2018 – Sep 2024
M.Sc. in Software Engineering - <i>Sharif University of Technology, Iran</i>	Sep 2015 - Jan 2018
B.Sc. in Computer Engineering - <i>Sharif University of Technology, Iran</i>	Sep 2011- Sep 2015

## EXPERIENCE

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**Senior Data Scientist**– [Grid Dynamics Inc.](#) US, remote Dec 2024 – Present

- **Research Scientist** at [Apple Inc.](#) Seattle, WA
  - Design and maintain software systems to process, evaluate, and analyze generative AI models automatically.

**Research Assistant** - [Software Engineering and Analysis Lab](#), UC Irvine, California Jun 2019 – Sep 2024

Citation: 85, H-index: 4

Awarded a \$1.2M grant from **National Science Foundation** to advance automated software accessibility testing and repair.

- Developed a novel context-aware icon labeling model for inaccessible icons in Android apps, utilizing an Encoder-Decoder deep learning architecture with **ResNet** and **LSTM** in **PyTorch**, trained on over 200GB of mobile screenshots.
- Developed novel automated techniques for detecting accessibility issues during app interactions. Implemented a server system using **Python**, **Unix Shell**, and **Flask** to communicate with client systems built in **Java** and the **Android API**.
- Designed and implemented the first automated explainable technique to build energy test oracles using an **Attention Mechanism** with an **LSTM** model, revolutionizing mobile app energy testing techniques.

**Machine Learning Research Intern** – [Apple Inc.](#), Seattle, Washington Mar 2024 – Aug 2024

- Introduced a novel **LLM-based** technique to automatically suggest fixes for accessibility issues in **iOS** apps.
- Developed a multi-agent LLM architecture to generate fix strategies, localize issues within the source code, and propose **SwiftUI** code modification suggestions for addressing accessibility issues reported on GUI, achieving a 77% success rate in effectiveness.
- Submitted findings to the International Conference on Software Engineering (ICSE) 2025; Paper available on [arXiv](#).

**Software Engineer** - [Candelis Inc.](#), Newport Beach, California Jun 2021 - Sep 2023

- Led the development of a performance monitoring dashboard using **Prometheus**, enhancing defect localization and providing critical system metrics.
- Developed a cost-efficient archive and backup mechanism for **DICOM** data in **C++** using various **Amazon S3's** storage classes on **Amazon AWS**, achieving a 72.5% reduction in storage costs per gigabyte.
- Designed and implemented the **DICOMWeb** standard in **C++**, enabling web-based access to DICOM data. Successfully integrated it into the system, where it has been in use and actively maintained for the past two years.

**Software Engineering** - [Café Bazaar](#), Tehran, Iran Jun 2018 - Aug 2018

- Engineered an advertising service for Iran's largest app store (Android platform), serving over 40 million users, enabling ad placement on the search page.

## SKILLS

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

**Database:** PostgreSQL, SQLite, MySQL, Redis

**Technologies and Frameworks:** PyTorch, Keras, Matlab, Django, Docker, Kubernetes, Amazon S3

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

**Machine Learning:** Supervised and Unsupervised Learning, Deep Learning, Large Language Models

## PUBLICATIONS

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- [C1] **F. Mehralian**, Z. He, S. Malek. "Automated Accessibility Analysis of Dynamic Content Changes on Mobile Apps" In proceedings of the IEEE/ACM 47th International Conference on Software Engineering (ICSE), 2025
- [C2] M. Tafreshipour, A. Deshpande, **F. Mehralian**, I. Ahmed, and S. Malek. "Ma1 ly: A Mutation Framework for Web Accessibility Testing." In *Proceedings of the 33rd ACM SIGSOFT International Symposium on Software Testing and Analysis (ISSTA)*, 2024
- [C3] **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
- [C4] 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
- [C5] **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.
- [C6] 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

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### Fellowships and Scholarships:

- Richard N. Taylor Graduate Award in Software Engineering 2023
- Graduate Dean's Dissertation Fellowship for outstanding academic achievements 2023
- Informatics Department Dissertation Writing Fellowship 2023-2024
- National Elites Foundation Scholarship 2016-2017

### Travel Awards:

- NSF travel award to attend Automated Software Engineering conference, Pittsburgh 2022
- NSF travel award to attend Automated Software Engineering conference, San Diego 2019
- Grace Hopper scholarship to attend the conference in Orlando, Florida 2019

### Honorable Mention:

- No-Exam admission offer for MSc and PhD programs at Sharif University of Technology 2015, 2017
- Ranked in the top 0.5% in the nationwide BSc entrance exam 2011

## TEACHING EXPERIENCE

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### Graduate Teacher Assistant, University of California, Irvine

- **Courses:** Human-Computer Interaction, Distributed Software Architecture, Software Design
- Conducted office hours to assist students with course material and assignments.
- Organized and led Q/A discussion sessions, supervised group projects, and provided feedback for them.

### Teacher Assistant, Sharif University of Technology

- **Courses:** Data Mining, Software Engineering lab, Database Design
- Led a team of TAs in the creation and implementation of lab syllabus and holding weekly sessions.
- Designed assignments and evaluated students' performance.

## LEADERSHIP EXPERIENCE & COMMUNITY INVOLVEMENT

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### Sighted guide and tour leader, 38th Annual CSUN Assistive Technology Conference

Member of **Big Brothers Big Sisters** of Orange County and the Inland Empire

Member of **live virtualization team**, the first Virtual ICSE, International Conference on Software Engineering

### (Peer) reviewer:

- IEEE Transactions on Software Engineering, 2024
- Journal of Science of Computer Programming, 2023
- International Conference on Software Architecture (ICSA'22)
- International Conference on Mobile Software Engineering and Systems (MobileSoft'21)

Member of **ACM SIGSOFT** and **ACM-W**