FOROUGH MEHRALIAN
Informatics Department at UC Irvine

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EDUCATION

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

EXPERIENCE

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
- 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.
- Led the development of a performance monitoring dashboard using **Prometheus**, enhancing defect localization and providing critical system metrics.

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.
- Implemented the **microservices** using **Django** and **PostgreSQL**, containerized with **Docker**, and orchestrated with **Kubernetes**, within an **Agile** development environment.

SKILLS

Programming Languages: Python, Java, C/C++
Database: PostgreSQL, SQLite, MySQL, Redis
Technologies and Frameworks: PyTorch, Keras, Matlab, Django, Docker, Kubernetes, Amazon AWS, L
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

[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. "Ma11y: 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

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

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

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**