FOROUGH MEHRALIAN

Fifth year PhD student in Software Engineering supervised by Prof. Sam Malek <malek@uci.edu>

University of California, Irvine ○ f.mehralian90@gmail.com ○ 949-774-9929 ○ https://www.ics.uci.edu/~fmehrali/

Education

Ph.D. in Software Engineering | *University of California, Irvine*; *GPA: 3.94/4* Sep 2018 - Jun 2024

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]
  - Introduced the problem of over accessibility, providing more information and functionalities to assistive technologies.
  - Studied the impacts of over-accessibility on security, accessibility, and workflow violation.
  - Utilized static and dynamic analysis techniques to detect over-accessibility issues in apps.
- Co-First author of GroundHog, an automated accessibility crawler for mobile apps. [Accepted at ASE`22]
  - Utilized virtualization to repeat the same action in a specific state of the app with various assistive services.
  - Detected previously unknown interactive accessibility issues in a large set of apps.
- 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 encoder-decoder architecture using PyTorch to learn icon labels in their context.
  - 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 Deep Learning-based test oracle for energy defects in Android using PyTorch.
  - Utilized Attention mechanism to improve model explainability and localize energy defects during the test.

Software Engineering Intern,

Candelis Inc., Newport Beach, California Jun 2021 - Sep 2021, Jan 2022 - Jun 2022

- Designed and implemented a REST server for DICOMWeb standards, enabling web-based medical imaging.
- The Store, Retrieve, and Query APIs of this server run in a new service, integrated with the 15-year-old source code of the company.
- Designed and implemented a cost-efficient archive/backup mechanism utilizing various Amazon S3 storage classes.

Software Engineering Intern,

Café Bazaar, Tehran, Iran Jun 2018 - Aug 2018

- Designed and implemented a Django micro-service for advertising in the search page of Bazaar, the number-one Iranian app store with more than 40M users.
- Changed the previous Redis database to PostgreSQL and optimized the queries to deal with performance and scalability.
- Employed Second-bid auction strategy for the advertisement and beta-tested the service, which is still under maintenance.

Graduate Research Assistant,

Automated Software Engineering Lab, Sharif University of Technology, Tehran, Iran Sep 2016 - Jan 2018

- Proposed an automated approach for recommending feature changes to the developers by analyzing user expectations from user reviews in app stores.
- Programmed 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

- Collaborated remotely with 2 senior software engineers and a faculty member who have founded Javacup, the biggest non-profitable community of Iranian Java Developers, resulted in an increased engagement of users, which improved the Alexa rank of the website by 20,000.

Android Developer,

Behsa Information Technology Advisors, Esfahan, Iran Jun 2014 - Sep 2014

- Designed and Implemented an android application for the Municipality of Isfahan to facilitate taxi inspections.
- Defined a REST API to fetch drivers' information from the server and utilized lazy loading technique for an optimized communication with the server.

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 its implementation 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
Jungle's Secret: A popular board game named "Jungle's Secret" written in Java

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

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

Teaching Assistant

University of California, Irvine

- Software Design, *Prof. Joshua Garcia*
- Introduction to Software Engineering, *Prof. Hadar Ziv*

Sharif University of Technology, Tehran

- Software Engineering Lab (Head of TAs), *Prof. Hassan Mirian*
- Data Mining, *Prof. Hamid Beigy*
- Database Design, *Prof. Abbas Heydarnoori*