# Alireza (Aaron) Imani

+1 (949) 824-2901 | aaron.imani@uci.edu | aaronimani.dev

Google Scholar | aaron-imani | aaron-imani | aaron_imn

Irvine, CA - 92617, USA

Last Updated: **November 25, 2026**

## Summary

Alireza (Aaron) Imani is a Ph.D. candidate in Software Engineering at the University of California, Irvine, holding a Master's degree in Software Engineering from the University of Calgary. His research lies at the intersection of artificial intelligence and software engineering, with a particular focus on mechanistic interpretability, LLM behavior, and agentic AI systems. With five years of research experience, he has authored six peer-reviewed publications at leading international conferences, including **ICSE** and **MSR**. He serves on the **CHASE** program committee and is a reviewer for leading journals, including IEEE Transactions on Reliability, **EMSE**, and **TOSEM**.

## Education

- **University of California, Irvine** *Expected 06 / 2027*
  *Ph.D. in Software Engineering* Irvine, USA
  - GPA: 4.00/4.00
  - Dissertation: Interpreting Large Language Models in Code Intelligence Tasks
- **University of Calgary** *11 / 2023*
  *M.Sc. in Electrical Engineering - Software Engineering* Calgary, Canada
  - GPA: 4.00/4.00
  - Dissertation: Effective Control System Framework Selection through Checklist-based Software Quality Evaluation
- **Ferdowsi University of Mashhad** *09 / 2020*
  *B.Sc. in Computer Engineering* Mashhad, Iran
  - Final Project: Workflow Scheduling Using Artificial Bee Colony Optimization

## Experience

- **University of California, Irvine - STAIRS Lab [🌐]** *09/2023 – Present*
  *Research Assistant* Irvine, USA
  - Published three peer-reviewed papers.
  - Designed and evaluated innovative LLM-based approaches for code-related tasks, such as commit message generation, improving developers' productivity.
  - Investigated the interpretability of LLMs in software engineering activities
- **University of Calgary - SEPE Lab [🌐]** *01/2021 – 08/2023*
  *Research Assistant* Calgary, Canada
  - Published three peer-reviewed papers.
  - Explored methods to assess and improve the quality of open-source software, contributing to community-driven development practices.
  - Studied the challenges of requirements engineering in multidisciplinary teams
- **Sessional Instructor** *Calgary, Canada*
  *University of Calgary* 08/2022 – 12/2022
  - Lectured a graduate-level course, "Programming Fundamentals for Data Engineers", which covers the fundamentals of Python programming, including Basic data structures and algorithms; Loops and iterations; Files and I/O, Functions, Classes, Modules, and Packages; Strings and text manipulation; Data wrangling; Network and Web programming, and Data visualization.
- **Herzberg Astronomy and Astrophysics Research Centre [🌐]** *01/2021 – 08/2022*
  *Embedded Software Developer* Penticton, Canada

- Contributed to the ARTTA-4 project, focusing on control system enhancements.
- Developed interconnected device servers in C++ and Python using the Tango Controls framework for the control system managing advanced radio telescopes at Dominion Radio Astrophysical Observatory.
- Facilitated seamless communication with hardware devices, such as a Moxa serial device server and a LabJack T4 device, by developing robust software interfaces.

## Research Themes

- **LLM-Based Agents for Software Engineering [P.2, P.1]** *2026 – Present*
  - Investigating and improving the capabilities of LLM-based software engineering agents, with a focus on agentic memory, reusable skills, and repository-level code generation. Exploring the effectiveness of memory retrieval and utilization, characterizing the structure and quality of agent skills, and leveraging procedural similarity to improve repository-level code generation.
- **Mechanistic Interpretability of Large Language Models for Code [C.6]** *09/2024 – Present*
  - Investigating the underlying mechanisms of Large Language Models (LLMs) by identifying internalized software engineering concepts and examining their causal influence on model behavior and downstream task performance.
- **Understanding and Improving Context for Large Language Models [C.4, C.5]** *09/2023 – Present*
  - Investigating how prompts evolve in real-world software repositories, identifying contextual bottlenecks in LLM-based software engineering, and developing context enhancement techniques that enable smaller open-weight models to achieve performance comparable to or exceeding that of larger proprietary models.

## Publications

C=Conference, P=pre-print

**[P.2]** QiHong Chen, **Aaron Imani**, and Iftekhar Ahmed (2026) **ProjAgent: Procedural Similarity Retrieval for Repository-Level Code Generation**. Under-review in a top-tier journal.

**[P.1]** David Boram Hong, **Aaron Imani**, and Iftekhar Ahmed (2026) **From Anatomy to Smells: An Empirical Study of SKILL.md in Agent Skills**. Under-review in a top-tier conference.

**[C.6]** **Aaron Imani**, Mohammad Moshirpour, and Iftekhar Ahmed (2025). **Inside Out: Uncovering How Comment Internalization Steers LLMs for Better or Worse**. In *2026 IEEE/ACM 48th International Conference on Software Engineering (ICSE)*.

**[C.5]** **Aaron Imani**, Iftekhar Ahmed, and Mohammad Moshirpour. (2025) **Context Conquers Parameters: Outperforming Proprietary Llm in Commit Message Generation**. In *2025 IEEE/ACM 47th International Conference on Software Engineering (ICSE)*, pp. 1844-1856. IEEE. Ottawa, ON, Canada. DOI: 10.1109/ICSE55347.2025.00048

**[C.4]** Mahan Tafreshipour, **Aaron Imani**, Eric Huang, Eduardo S. d. Almeida, Thomas Zimmermann and Iftekhar Ahmed (2025) **Prompting in the Wild: An Empirical Study of Prompt Evolution in Software Repositories**. In *IEEE/ACM 22nd International Conference on Mining Software Repositories (MSR)*, pp. 1844-1856. IEEE. Ottawa, ON, Canada. DOI: 10.1109/ICSE55347.2025.00048

**[C.3]** Ali Salmani, **Alireza Imani**, Majid Bahrehvar, Linda Duffett-Leger, and Mohammad Moshirpour (2022) **A Data-Centric Approach to Evaluate Requirements Engineering in Multidisciplinary Projects**. In *2022 IEEE International Conference on Systems, Man, and Cybernetics (SMC)*, pp. 903-908. IEEE. Prague, Czech Republic. DOI: 10.1109/SMC53654.2022.9945270

**[C.2]** Ali Salmani, **Alireza Imani**, Majid Bahrehvar, Linda Duffett-Leger, and Mohammad Moshirpour (2022) **An Intelligent Methodology to Enhance Requirements Engineering in Multidisciplinary Projects**. In *2022 IEEE Canadian Conference on Electrical and Computer Engineering (CCECE)*, pp. 452-457. IEEE. Halifax, NS, Canada. DOI: 10.1109/CCECE49351.2022.9918286

**[C.1]** **Alireza Imani**, Mohammad Moshirpour, and Leonid Belostotski (2021) **Checklist-based Software Quality Evaluation of Tango Controls**. In *2021 International Conference on Information Systems and Advanced Technologies (ICISAT)*, pp. 1-7. IEEE. Tebessa, Algeria. DOI: 10.1109/ICISAT54145.2021.9678411

## Teaching

**Lecturer**

- University of Calgary, **Programming Fundamentals for Data Engineers** 08/2022 – 12/2022

**Teaching Assistant**

- University of California, Irvine, IN4MATX 43, **Intro to Software Engineering** 07/2026 – 08/2026
- University of California, Irvine, IN4MATX 115, **Software Testing & Quality Assurance** 03/2026 – 06/2026
- University of California, Irvine, SWE 249P, **Applied Data Analytics** 01/2026 – 03/2026
- University of California, Irvine, SWE 246P, **Mobile Programming** 01/2026 – 03/2026
- University of California, Irvine, SWE 240P, **Data Structures** 09/2025 – 12/2025
- University of California, Irvine, SWE 241P, **Algorithms** 09/2025 – 12/2025
- University of California, Irvine, I&C SCI 32, **Programming with Software Libraries** 03/2025 – 06/2025
- University of California, Irvine, I&C SCI 32, **Programming with Software Libraries** 01/2025 – 03/2025
- University of California, Irvine, SWE 240P, **Data Structures** 09/2024 – 12/2024
- University of California, Irvine, SWE 241P, **Algorithms** 09/2024 – 12/2024
- University of California, Irvine, I&C SCI 45J, **Programming in Java as a Second Language** 08/2024 – 09/2024
- University of California, Irvine, I&C SCI 32, **Programming with Software Libraries** 03/2024 – 06/2024
- University of California, Irvine, I&C SCI 32, **Programming with Software Libraries** 01/2024 – 03/2024
- University of California, Irvine, IN4MATX 117, **Project in Software System Design** 09/2023 – 12/2023
- University of Calgary, SENG401, **Software Architecture** 01/2022 – 04/2022
- University of Calgary, ENSF480, **Principles of Software Design** 08/2021 – 12/2021
- University of Calgary, ENSF609, **Team Design Project in Software Engineering** 01/2021 – 04/2021
- Ferdowsi University of Mashhad, **Data Structures** 03/2019 – 06/2019

## Projects

- **OMEGA: State-of-the-art Automated Commit Message Generation Tool** *03/2024 - 08/2024*
  *Tools: Python, Langchain, vllm* [GitHub]
  - Developed OMEGA, a state-of-the-art tool for commit message generation that prioritizes data privacy, reduces carbon footprint, and lowers deployment costs
  - Enhanced privacy by eliminating reliance on proprietary large language models, ensuring secure and ethical AI adoption.
  - Optimized sustainability by adopting a 4-bit quantized open-source large language model runnable on local GPUs with only 8GB of VRAM.
  - Proposed FIDEX, a novel diff augmentation technique that improved LLM performance on understanding code changes by 20%
  - Adapted Multi-intent Method Summarization to support change-centric software engineering tasks, enabling better summarization of code edits

## Service Activities

**Program Committee**

- International Conference on Cooperative and Human Aspects of Software Engineering 11/2026 – Present

**Reviewer**

- Empirical Software Engineering 4/2026 – Present
- ACM Transactions on Software Engineering and Methodology 11/2024 – Present

• IEEE Transactions on Reliability 10/2024 – Present

**Volunteer**

• Chair, IEEE Southern Alberta Computer Society Chapter 01/2023 – 08/2023

• Vice Chair, IEEE Southern Alberta Computer Society Chapter 04/2021 – 12/2022

**Student Mentor**

• Mentor, MedTech Innovation Hackathon 10/2024

• Mentor, ICS Honors Program 01/2024 – 07/2024

## SKILLS

- **Research Skills:** Natural Language Processing, Large Language Models, Fine-tuning, Prompt Engineering, Model Training, Machine Learning, Neural Network, Dataset Curation, Dataset Labeling, Model Evaluation, Deep Learning, RNN, LSTM, Literature Review, Empirical Research, Interview/Survey Design, Qualitative Analysis, Statistical Analysis, Human Subjects Research, Statistics, IoT
- **Programming Languages:** Python, C, C++, Java, Swift, JavaScript
- **Web Technologies:** ReactJS, HTML5, CSS, Django, REST API
- **Database Systems:** MySQL, SQLite, Dynamo DB, Firebase
- **Data Science & Machine Learning:** PyTorch, SGLang, Langchain, Scikit-learn, NLTK, transformers
- **Cloud Technologies:** AWS, Heroku, Firebase
- **DevOps & Version Control:** Git, Docker, Conda

## HONORS AND AWARDS

• **Chair's Award** *09/2023*

*Donald Bren School of Information and Computer Sciences*

◦ Received upon admission to the PhD program at the University of California, Irvine

◦ Granted in recognition of exceptional potential to make significant research contributions to the Informatics community

• **Graduate Student Productivity Reward** *09/2022*

*University of Calgary*

◦ Granted to graduate students who published at least one paper in a peer-reviewed conference

• **AI Competition Achievement** *03/2019*

*Sharif Artificial Intelligence Challenge* [🌐]

◦ Designed an innovative AI backend for a real-time strategic game

◦ Ranked among the top 8 teams in the Main Game track out of over 1,000 participants

◦ Achieved 2nd place in the Mini Game track

## REFERENCES

1. **Prof. Iftekhar Ahmed**
   Associate Professor, Donald Bren School of Information and Computer Sciences
   University of California, Irvine
   Email: iftekha@uci.edu
   *Relationship: PhD Advisor*

2. **Prof. Thomas Zimmermann**
   Chancellors Professor and Bren Chair, Donald Bren School of Information and Computer Sciences
   University of California, Irvine
   Email: tzimmer@uci.edu
   *Relationship: Faculty Collaborator*