# Parnian Shabani Kamran

Electrical and Computer Engineering Department, University of California, Davis, CA, 95616

🌐 https://parniaan.github.io ✉ pkamran@ucdavis.edu ⌂https://github.com/Parniaan

## RESEARCH INTERESTS

Development of safe and reliable systems using static and dynamic analysis, and fuzz testing, Building safe and reliable AI-powered programming tools, code language models and AI agents using formal methods, prompting and reasoning techniques, Study, analysis and measurement of open source supply chain security threats

## SKILLS

| | |
|---|---|
| **Programming:** | Rust, Python, Dafny, C++11, JavaScript |
| **Libraries:** | Hypothesis, Pandas, NumPy, PyTorch, OpenCV, LangChain |
| **Software & Tools:** | **Theorem Prover:** Z3 |
| | **Parallel Programming:** OpenCilk |
| | **Performance Analyzer:** Intel VTune, AMD uProf, Perf |
| | **Machine Learning:** WEKA |

## EDUCATION

**Ph.D. Computer Engineering**                                                                                          *2021 - 2027*
*Department of Electrical and Computer Engineering, University of California, Davis*
*Current Research: Improving Large Language Models trustworthiness in code completion tasks using formal verification and latest prompting and reasoning techniques including Chain of Thought (COT), using LLM agents and external knowledge with Retrieval-Augmented Generation (RAG)*
*Supervisor: Caleb Stanford*

**M.Sc. Computer Engineering**                                                                                          *2014 - 2016*
*Department of Computer Engineering, Tehran Polytechnic, Tehran, Iran*
*Thesis: Design and development of a process-variation resilient aging sensor for detecting hardware aging in the presence of process verification*
*Supervisor: Hamid R. Zarandi*

**B.Sc. Computer Engineering**                                                                                          *2008 - 2013*
*Department of Electrical and Computer Engineering, Isfahan University of Technology, Isfahan, Iran*
*Thesis: Development of an Android application for currency recognitions for visually-impaired people*

## RESEARCH PUBLICATIONS

**Parnian Kamran**, Premkumar Devanbu, and Caleb Stanford. 2024. **Vision Paper: Proof-Carrying Code Completions**. In 39th IEEE/ACM International Conference on Automated Software Engineering Workshops (ASEW '24), October 27-November 1, 2024, Sacramento, CA, USA. ACM, New York, NY, USA, 7 pages. https://doi.org/10.1145/3691621.3694932

A. A. Zeraatkar, **P. S. Kamran**, I. Kaur, N. Ramu, T. Sheaves and H. Al-Asaad, **On the Performance of Malware Detection Classifiers Using Hardware Performance Counters**, 2024 International Conference on Smart Applications, Communications and Networking (SmartNets), Harrisonburg, VA, USA, 2024, pp. 1-6, doi: 10.1109/SmartNets61466.2024.10577644.

A. A. Zeraatkar, **P. S. Kamran** and H. Al-Asaad, **Advancements in Secure Computing: Exploring Automated Repair Debugging and Verification Techniques for Hardware Design**, 2024 IEEE 14th Annual Computing and Communication Workshop and Conference (CCWC), Las Vegas, NV, USA, 2024, pp. 0357-0364, doi: 10.1109/CCWC60891.2024.10427806.

## WORK EXPERIENCE

Software Engineer, Snapptrip, Tehran, Iran *2017 - 2020*

- I worked on development of a single page applications for B2C to improve customer's experience and automating manual tasks of agents and service providers

Intern in Huawei LTE Network Optimization Team, Tehran, Iran *2016 - 2017*

- I worked on automation of tracking network failures to improve customer's experience and decrease the network failure rate

## RESEARCH & TEACHING EXPERIENCE

Research Assistant, UC Davis, CA *Fall 2021 - present*

- My research focuses on enhancing the trustworthiness of code language models through formal methods and by applying the latest prompting and reasoning techniques to improve their reliability and performance in code-related tasks.

Teaching Assistant, UC Davis, CA *Spring 2024*

- I was TA for ECS 189C Software Correctness, A sophomore-level course in Dafny, Z3 and Hypothesis, and Rust

Teaching Assistant, UC Davis, CA *Winter 2023*

- I was TA for EEC 180 Digital Systems II, A sophomore-level course in Verilog

Teaching Assistant, UC Davis, CA *Fall 2022*

- I was TA for EEC 193A Senior Design Project, A sophomore-level course in Internet of Things

Research Assistant, DADS Lab, Tehran Polytechnic, Tehran, Iran *2014 - 2016*

- My research focus was on design and development of a process-variation resilient aging sensor that mitigated digital circuits degradation caused by aging

Teaching Assistant, Tehran Polytechnic, Tehran, Iran *Fall 2016*

- I was TA for Computer Architecture, A sophomore-level course in VHDL

Teaching Assistant, Isfahan University of Technology, Isfahan, Iran *Spring 2013*

- I was TA for Digital System Design II, A sophomore-level course in Verilog

Teaching Assistant, Isfahan University of Technology, Isfahan, Iran *Fall 2011*

- I was TA for Digital System Design, A sophomore-level course in Verilog

## ACADEMIC SERVICES

- Session chair for ASE *October 2024*
- Reviewer for IEEE Access *Summer 2024*
- Committee Member of FPGA Hackathon, Tehran Polytechnic (Amirkabir University), Tehran, Iran *Fall 2015*

## VOLUNTEER EXPERIENCES

- Student volunteer for ASE *October 2024*