Parnian Shabani Kamran

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EDUCATION

M.Sc. Computer Science, *University of California, Davis* (GPA: 3.8/4) *Sept 2023 - Present*

M.Sc. Computer Engineering, *Amirkabir University of Technology* (GPA: 18.34/20) *Sept 2014 - Sept 2016*

B.Sc. Computer Engineering, *Isfahan University of Technology* *Sept 2008 - Sept 2013*

Relevant coursework, *Computer Architecture, Machine Learning, Programming Languages, Computer Security, Parallel Programming, Design and Analysis of Algorithms, Large Language Models*

RESEARCH PUBLICATIONS

Parnian Kamran, Premkumar Devanbu, and Caleb Stanford, **Vision Paper: Proof-Carrying Code Completions**. In 39th IEEE/ACM International Conference on Automated Software Engineering Workshops (ASEW '24)

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** International Conference on Smart Applications, Communications and Networking (SmartNets), 2024

A. A. Zeraatkar, **P. S. Kamran** and H. Al-Asaad, **Advancements in Secure Computing: Exploring Automated Repair Debugging and Verification Techniques for Hardware Design**, IEEE 14th Annual Computing and Communication Workshop and Conference (CCWC), 2024

RESEARCH AND WORK EXPERIENCE

R&D Summer Intern, Endor Labs, Palo Alto, California *June 2025 - Sept 2025*

- Designed and delivered **AI agents** for **open-source vulnerability prioritization** on an accelerated timeline (3 months), including secure **MCP-based LLM integrations** built in under two weeks, achieving up to 91% reduction in static analysis false positives
- Researched and analyzed open source software common vulnerabilities and infrastructure as code (**terraform**) and build-time information using **Bazel** as the context for AI agent to **reduce noise among SAST findings**
- Participated in **Endor Labs Hackathon 2025**, collaborating on innovative AI solutions for enhancing **open-source software security** and vulnerability detection

Researcher, University of California, Davis *Sept 2021 - March 2025*

- Developed a **pipeline for Agentic AI system** including **RAG**, **embeddings**, and tools and function calling to implement proof-carrying code completion (PC^3) to analyze the efficacy of LLMs in generating proofs
- Implemented **End-to-end supervised learning pipeline** for malware detection using Hardware Performance Counters, conducted 144 experiments using 20 classifier and ensemble ML methods
- A survey on techniques for automating the repair and verification of hardware designs

Software Engineer, Snapptrip (A local platform for accommodation and travel bookings) *Nov 2017 - Dec 2020*

- Developed and optimized responsive user interfaces for fulfillment workflows using **React**, **AngularJS** and **Sass**, integrated with REST APIs and **WebSocket**-based real-time data synchronization, ensuring scalable user experiences and enhancing the reliability and scalability of booking workflows across distributed systems
- Integrated visual analytics and data export capabilities into admin dashboards using **data visualization** libraries and reporting tools, enabling data-driven insights for finance team and improving booking fulfillment efficiency
- Implemented **efficient data handling mechanisms** (filtering, sorting, indexing) to support large-scale data operations, improving system responsiveness and assisting data analysts in **revenue trend detection**

PROJECTS

- Developed a **supervised learning pipeline** to forecast build reproducibility of $3,700+$ open-source software artifacts generated by BugSwarm, achieving 93% accuracy and 94%recall, optimizing the evaluation phase
- Optimized a multicore 2D screensaver by **parallelizing a quadtree-based collision detection algorithm** using **OpenCilk**, achieving **1.5 average speedup on 8-core AWS** machines through recursive task parallelism, and performance benchmarking across $1,000 - 5,000$ frames while maintaining correctness in collision results to outperform the $\Theta(N^2)$ pairwise checks
- Optimized in-place bit-matrix rotation in standard C by profiling with **perf** and applying word-level parallelism (**bit hacks**) to outperform the baseline follow-the-cycles algorithm, achieving the **#1 speedup performance among 54 students** in the course
- Improved **package confusion detection methods** of Microsoft OSSGadget for npm and PyPI ecosystem, boosting detection accuracy of malicious attacks to 38.6% through refined rules based on the nature of package typosquatting attacks
- Developed a comprehensive framework and new benchmark to measure **LLM faithfulness** under **perturbed Chain-of-Thought reasoning**, injecting controlled early- and mid-step errors into 101 DeltaBench problems and evaluating GPT-4-1-mini, GPT-4o-mini, Qwen2.5-72B, and Llama-3.1-70B using behavioral metrics that reveal how models balance obedience to incorrect reasoning versus correction driven by internal knowledge

SKILLS

Programming Languages:	Python, C++, Dafny, Rust, JavaScript
Machine Learning:	LangChain, LangGraph, Pandas, PyTorch, Scikit-Learn, OpenCV
Model Deployment & MLOps:	Docker, Kubernetes, gRPC
Software & Infrastructure Tools:	Bazel, Terraform, Helm
AI Agent Protocols & Architecture:	Anthropic MCP

TEACHING EXPERIENCE

MAT 21B Calculus *Fall 2025*

- Leaded weekly discussions and individually designed presentations for discussions based on assignments and guide individualized problem-solving, grading exams and assignments

ECS 189C Software Correctness: sophomore-level course in Dafny, Z3 and Hypothesis, and Rust *Spring 2024*

- In Coordination with the professor, structured a course for 60+ students, including reviewing and designing assignments and exams

EEC 180 Digital Systems II: sophomore-level course in Verilog *Winter 2023*

- Individually managed weekly lab sessions for 20+ students and aided students in setting up the code development and simulation tools, running test cases, diagnosing errors and resolving them

EEC 193A Senior Design Project: sophomore-level course in Internet of Things *Fall 2022*

- Coordinated with the professor to structure a course for 19 students, grading papers and assignment preparation
- Individually organized weekly 4-hour lab sessions and designed 2 lab assignments

ACADEMIC SERVICES

- Session Chair at the International Conference on Automated Software Engineering (ASE) *October 2024*
- Reviewer for IEEE Access *Summer 2024*

VOLUNTEER EXPERIENCE

- Student volunteer for ASE *October 2024*