Keyur Parag Joshi

Email: keyurj@google.com | LinkedIn: linkedin.com/in/keyurpjoshi | Website: kpjoshi.com

---

Work Experience

Google – Software Engineer L4   August 2024 — Ongoing

- Designed & implemented infrastructure for compartmentalized testing of AI agents that use stateful tools
- Onboarded evaluation benchmarks for AI agents in key domains (e.g., enterprise AI and customer service)
- Used evaluation data to improve AI agent quality via prompt engineering, scaffolding improvements, and bug fixes
- Integrated dynamic user simulation for the testing of AI agents in Google's open-source Agent Development Kit (ADK)

Microsoft Research India – Research Intern   May 2022 — August 2022

- Designed and implemented a library for training neural networks such as RNNs using only fixed-point arithmetic
- Demonstrated proof-of-concept that achieved accuracy similar to that of a floating-point implementation of the same RNN
- Published open-source tool at github.com/KPJoshi/Fixed-Point-RNN-Training

---

Education

University of Illinois Urbana-Champaign (UIUC), USA   August 2017 — May 2024
PhD in Computer Science
Research focus – analysis of quantitative uncertainty in programs and systems; effective application of approximations

Indian Institute of Technology, Hyderabad (IITH), India   August 2013 — May 2017
Bachelor of Technology (Honours) in Computer Science and Engineering
Valedictorian

Skills

Software Engineering: Python, Mercurial, Bazel, Bash, C/C++, Git, LLVM, PyTorch, Go, Java, Rust, Make, Docker

Soft Skills: Teamwork (10+ team members), Communication, Documentation (developer and end-user), Leadership

Languages: English (native proficiency), German (CEFR A2+)

Coursework: Programming Languages, Compilers and Optimizations, Data Structures and Algorithms, Software Engineering, Approximate Algorithms, Software Verification, Machine Learning, Computer Architecture, Operating Systems, Networks, etc.

Open-Source Tools

User Simulation in Google Agent Development Kit: Dynamic, model-driven user simulation for testing AI agents

- Contributions: feature implementation, testing, user documentation, and editing of the announcement blog post
- Documentation: google.github.io/adk-docs/evaluate/user-sim/
- Blog post: developers.googleblog.com/en/announcing-user-simulation-in-adk-evaluation/

Fixed-Point-RNN-Training: Tool for training RNNs using exclusively fixed-point arithmetic

- Tool, example, tutorial: github.com/KPJoshi/Fixed-Point-RNN-Training

AxProf: Tool for statistical analysis of the precision of approximate algorithms

- Successfully found bugs in multiple approximate algorithm implementations
- Tool, examples, tutorial: axprof.org

Publications

- **FastFlip: Compositional SDC Resiliency Analysis**
  Keyur Joshi, Rahul Singh, Tommaso Bassetto, Sarita Adve, Darko Marinov, Sasa Misailovic
  International Symposium on Code Generation and Optimization (CGO 2025)

- **Compositional Analysis of the Effects of Uncertainty on Computations**
  Keyur Joshi
  PhD Dissertation

- **GAS: Generating Fast and Accurate Surrogate Models for Autonomous Vehicle Systems**
  Keyur Joshi, Chiao Hsieh, Sayan Mitra, Sasa Misailovic
  International Symposium on Software Reliability Engineering (ISSRE 2024)

- **Verifying Controllers with Vision-based Perception Using Safe Approximate Abstractions**
  Chiao Hsieh, Yangge Li, Dawei Sun, **Keyur Joshi**, Sasa Misailovic, Sayan Mitra
  Embedded Software (EMSOFT 2022)

- **Diamont: Dynamic Monitoring of Uncertainty for Distributed Asynchronous Programs**
  Vimuth Fernando, **Keyur Joshi**, Jacob Laurel, Sasa Misailovic
  International Conference on Runtime Verification (RV 2021)

- **ApproxTuner: A Compiler and Runtime System for Adaptive Approximations**
  Hashim Sharif, Maria Kotsifakou, Yifan Zhao, Akash Kothari, Ben Schreiber, Elizabeth Wang, Yasmin Sarita, Nathan Zhao, **Keyur Joshi**, Vikram Adve, Sasa Misailovic, Sarita Adve
  ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming (PPOPP 2021)

- **Aloe: Verifying Reliability of Approximate Programs in the Presence of Recovery Mechanisms**
  Keyur Joshi, Vimuth Fernando, Sasa Misailovic
  IEEE/ACM International Symposium on Code Generation and Optimization (CGO 2020)

- **Statistical Algorithmic Profiling for Randomized Approximate Programs**
  Keyur Joshi, Vimuth Fernando, Sasa Misailovic
  ACM/IEEE International Conference on Software Engineering (ICSE 2019)

- **Verifying Safety and Accuracy of Approximate Parallel Programs via Canonical Sequentialization**
  Vimuth Fernando, **Keyur Joshi**, Sasa Misailovic
  ACM SIGPLAN Conference on Object-Oriented Programming, Systems, Languages, and Applications (OOPSLA 2019)

- **ApproxHPVM: A Portable Compiler IR for Accuracy-Aware Optimizations**
  Hashim Sharif, Prakalp Srivastava, Muhammad Huzaifa, Maria Kotsifakou, **Keyur Joshi**, Yasmin Sarita, Nathan Zhao, Vikram S. Adve, Sasa Misailovic, Sarita Adve
  ACM SIGPLAN Conference on Object-Oriented Programming, Systems, Languages, and Applications (OOPSLA 2019)

- **Identifying Optimal Parameters for Randomized Approximate Algorithms**
  Vimuth Fernando, **Keyur Joshi**, Darko Marinov, Sasa Misailovic
  Workshop on Approximate Computing Across the Stack (WAX 2019 – co-located with PLDI 2019)