

Keyur Parag Joshi

Room 3107, Thomas M. Siebel Center for Computer Science
University of Illinois at Urbana-Champaign, USA
Email: kpjoshi2@illinois.edu Phone: 217-904-6096 Website: kpjoshi.com

Education

- **University of Illinois at Urbana-Champaign (UIUC), USA**
August 2017 – May 2022 (Expected)
Ph.D Student in Computer Science advised by Sasa Misailovic
- **Indian Institute of Technology, Hyderabad (IITH), India**
August 2013 – May 2017
Bachelor of Technology (Honours) in Computer Science and Engineering
Valedictorian

Research Interests

- Programming languages and software engineering
- Testing and analysis of approximate and/or unreliable programs

Current Research

I am currently a Research Assistant at UIUC advised by Sasa Misailovic. My current projects include:

- **Dynamic Tracking of Reliability, Accuracy, and Fairness for Approximate Parallel Programs:** We bring existing analyses that are only available for sequential programs to parallel programs by generating an equivalent sequential program from the parallel program.
- **Accuracy of Programs with Recovery Mechanisms:** Quantifying the increase in accuracy of inaccurate programs that attempt to fix errors, for example, by re-executing computations. Existing analyses have limited support for statically reasoning about such recovery mechanisms.

Honors and Awards

- Awarded a travel grant by the LLVM Foundation to attend SC 2017
- Awarded the President of India's Gold Medal for achieving the highest GPA across all undergraduate programs at IIT Hyderabad (graduated 2013)

Previous Research Experience

- Spring 2018 – Co-organized the Brett Daniel Software Engineering Seminar at UIUC
- Summer 2016 – Internship at ENS/INRIA Paris under Dr. Albert Cohen
- Summer 2016 – Attended the Maths-CS-HPC Spring School at Lyon, France

Publications

- **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
41st 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
34th ACM SIGPLAN Conference on Object-Oriented Programming, Systems, Languages and Applications (OOPSLA/SPLASH 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
34th ACM SIGPLAN Conference on Object-Oriented Programming, Systems, Languages and Applications (OOPSLA/SPLASH 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)

Talks and Poster Presentations

- **Poster Presentation:** AxProf: Statistical Algorithmic Profiling for Randomized Approximate Programs: at Midwest PL Summit 2019
- **Conference Talk:** Statistical Algorithmic Profiling for Randomized Approximate Programs: at ICSE 2019
- **Seminar Talk:** Statistical Algorithmic Profiling for Randomized Approximate Programs: at the Brett Daniel Software Engineering Seminar at UIUC
- **Seminar Talk:** Monitor-Based Statistical Model Checking for Weighted Metric Temporal Logic: at the Brett Daniel Software Engineering Seminar at UIUC
- **Lightning Talk:** Implementation of a Cache Miss Calculator in LLVM/Polly: at the LLVM in HPC workshop, SC 2017
- **Seminar Talk:** Triangular inequality for compiler-based strength reduction: at the Brett Daniel Software Engineering Seminar at UIUC

Tools

- **AxProf:** Statistical Algorithmic Profiling for Randomized Approximate Programs: available with tutorial at axprof.org

Skills

- **Languages:** Extensive experience with C,C++, Python, Java, L^AT_EX, and LLVM
- **Programming Environments:** Experience using Visual Studio and Emacs

Activities

- **Leadership:** Served as the head of the Programming and Security Club at IIT Hyderabad
- **Social Service:** Volunteered for the National Service Scheme (NSS) of India