SAMEERAN JOSHI

Salt Lake City, Utah, USA| Joshisameeran17@gmail.com | https://sameeranjoshi.github.io

RESEARCH INTEREST

Compilers, Computer Architecture, Programming Languages, Compiler Optimizations, LLVM, Hardware-Software Codesign, Modern C++, HPC systems

PUBLICATIONS

Scheduling Languages: A Past, Present, and Future Taxonomy, M Hall, C Oancea, AC Elster, A Rasch, S Joshi, AM Tavakkoli, R Schulze. ArXiv version, Oct 2024

PEAK: **Generating High-Performance Schedules in MLIR**, Amir Mohammad Tavakkoli∗, **Sameeran Joshi∗**, Shreya Singh, Yufan Xu, P. Sadayappan, and Mary Hall. In Proceedings of the 36th International Workshop on Languages and Compilers for Parallel Computing**(LCPC23)**. Oct. 2023(Accepted)

An NSF REU Site Based on Trust and Reproducibility of Intelligent Computation: Experience Report, Mary Hall, Ganesh Gopalakrishnan, Eric Eide, Johanna Cohoon, Jeff M. Phillips, Mu Zhang, Shireen Y. Elhabian, Aditya Bhaskara, Harvey Dam, Artem Yadrov, Tushar Kataria, Amir Mohammad Tavakkoli, **Sameeran Joshi**, Mokshagna Sai Teja Karanam. In **EduHPC workshop** at The International Conference for High Performance Computing, Networking, Storage, and Analysis (**SC23**) (Accepted)

EDUCATION

School of Computing, University of Utah
PhD Student in Computer Science | Aug 2022 – Currently Enrolled

WORK EXPERIENCE

Argonne National Lab, USA
Research Aide Technical - PhD - LCF | June 2024 – Aug 2024

- Explored challenges and opportunities in supporting the HPC software stack on **AI accelerators** (Cerebras, Sambanova, Groq, GraphCore) at the AI testbed.
- Focused on understanding challenges in compilers, programming languages, and dataflow programming challenges.
- Support for GraphCore backend into DaCe (Data Centric Parallel Framework).

Advanced Micro Devices (AMD), India
CPU Compiler Engineer | June 2019 - June 2022

- *Extended* **LLVM BOLT** *to compare statically 2 binaries to report performance difference in 2 CPU generated binaries.*
- Reported performance issues and suggested optimizations in **AOCC** for SPEC CPU 2017, polybench, and HPC workloads.
- Contributed 50+ commits to **LLVM Flang,** adding support for OpenMP and Fortran 2018 features, and reviewing community patches and developing unit tests for Fortran 2008 in AOCC compiler.
- Presented paper at AMD's internal conference (13% acceptance rate).

OTHER PROJECTS

GCC - GNU Compiler Collection
Google Summer Of Code
Extending Csmith for GCC C-Language Extensions, June 2018 – April 2019
Mentor: Andi Kleen

- Added ~15 GNU C language extensions to Csmith and found unexplored bugs (ICE's, seg faults, crashes) in GCC compiler
- Found 12 critical bugs, 11 were fixed by GCC community
- Increased the fuzzing code coverage of Csmith on GCC by – line coverage: 5%, function coverage: 7%, branch coverage: 4%

TEACHING

- Taught labs, graded assignments and exams for roughly 220 students for CS4400 – Computer Systems class with Prof. Daniel Kopta at University of Utah.

OTHER ACTIVITIES

- Volunteered at CppOnSea'21, CppCon'21
- 2021 LLVM developers meeting PC member
- AE Committee CG025, ASPLOS25
- Student Travel Grant for attending Workshop on Sparse Tensor Computations