

SUDHANSHU GUPTA

Graduate Research Assistant, University of Rochester
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OVERVIEW

I am a systems researcher specializing in computer architecture and low-level software design, interested in the co-design of hardware and software aimed at improving the performance and efficiency of processors.

EDUCATION

University of Rochester, NY, USA Ph.D., Computer Science <i>Advisor:</i> Prof. Sandhya Dwarkadas <i>Dissertation:</i> Managing Data Movement Bottlenecks in Current and Future SoCs	August 2019 - June 2025 (expected) GPA: 3.75/4.00
University of Rochester, NY, USA M.S., Computer Science	August 2019 - May 2021 GPA: 3.82/4.00
NIIT University, RJ, India B.Tech., Computer Science and Engineering	July 2015 - July 2019 CGPA: 8.87/10.00

WORK EXPERIENCE

University of Rochester <i>Graduate Research Assistant, advised by Prof. Sandhya Dwarkadas</i>	August 2019 - Present Rochester, NY, USA
<ul style="list-style-type: none">Investigating data movement issues in current and future processors, focusing on:<ol style="list-style-type: none">Accelerator scheduling to reduce off-chip data movement and provide quality-of-service.Interconnect and memory controller design for PIM-enabled processors.Studying the impact of emerging host-side memory technologies on accelerator performance.	
AMD Research <i>Intern/Co-op, Core and SoC Architecture Team</i>	May 2022 - December 2022 Austin, TX, USA
<ul style="list-style-type: none">Contributed to the interconnect/memory controller interface for future architectures.Explored memory controller scheduling for novel memory architectures.	
Indian Institute of Technology, Delhi <i>Research Intern, supervised by Prof. Smruti Ranjan Sarangi</i>	January 2019 - July 2019 New Delhi, DL, India
<ul style="list-style-type: none">Designed a benchmark suite sporting state-of-the-art CNN-based autonomous driving applications.Extended <i>Tejas</i> simulator to characterize compute and memory deficiencies in modern out-of-order CPUs, demonstrating CPUs outperforming GPUs in multi-application scenarios.	
Indian Institute of Technology, Kanpur <i>Research Intern (SURGE), supervised by Prof. Biswabandan Panda</i>	May 2018 - July 2018 Kanpur, UP, India
<ul style="list-style-type: none">Studied memory subsystem optimizations for machine learning applications running on CPUs.Characterized the memory performance of emerging machine learning applications using <i>ChampSim</i> simulator, demonstrating the inefficacy of state-of-the-art cache prefetchers.	

PUBLICATIONS

- S. Gupta**, N. Madan, S. Puthoor, N. Jayasena and S. Dwarkadas, “Concurrent PIM and Load/Store Servicing in PIM-Enabled Memory,” *2025 IEEE International Symposium on Performance Analysis of Systems and Software (ISPASS)*, Ghent, Belgium, 2025, to appear.

2. **S. Gupta** and S. Dwarkadas, “RELIEF: Relieving Memory Pressure In SoCs Via Data Movement-Aware Accelerator Scheduling,” *2024 IEEE International Symposium on High-Performance Computer Architecture (HPCA)*, Edinburgh, United Kingdom, 2024, pp. 1063-1079, doi: 10.1109/HPCA57654.2024.00084.
3. D. Moolchandani, **S. Gupta**, A. Kumar and S. R. Sarangi, “Performance Prediction for Multi-Application Concurrency on GPUs,” *2020 IEEE International Symposium on Performance Analysis of Systems and Software (ISPASS)*, Boston, MA, USA, 2020, pp. 306-315, doi: 10.1109/ISPASS48437.2020.00050.

TECHNICAL SKILLS

- **Computer languages:** C, C++, CUDA, Python, Java, Bash, OpenMP, MPI, Verilog
- **Architectural simulators:** gem5, gem5-SALAM, gem5-Aladdin, GPGPU-Sim, ChampSim, Tejas
- **Tools:** Intel Pin, Perf, Git, Valgrind, GDB, Nvidia NSight

RELEVANT COURSEWORK

- CSC 451: Advanced Computer Architecture
- CSC 456: Operating Systems
- CSC 458: Parallel and Distributed Systems
- CSC 454: PL Design and Implementation
- CSC 572: Mobile Visual Computing
- CSC 573: Persistent Memory

PROFESSIONAL SERVICE

- Assisted in organizing **ISCA 2024 Program Committee** meetings.
- **Artifact Evaluation Committee:** ISCA 2024, ISCA 2023

TEACHING EXPERIENCE

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| University of Rochester | Rochester, NY, USA |
| • Teaching Assistant for CSC 252: Computer Organization (Spring 2020, Fall 2020, Spring 2021) | |
| NIIT University | Neemrana, RJ, India |
| • Teaching Assistant for CS 382: Programming Tools (Fall 2018) | |
| Indian Institute of Technology, Kanpur | Kanpur, UP, India |
| • Teaching Assistant Computer Architecture Summer School 2018 (Summer 2018) | |

AWARDS AND RECOGNITIONS

- Best Poster Award at SURGE 2018.
- Received merit-based scholarship to attend NIIT University.

COMMUNITY

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| University of Rochester | Rochester, NY, USA |
| • Serving in the Graduate Labor Union Organizing Committee. | |
| • Computer Science Events Committee co-chair. | |
| NIIT University | Neemrana, RJ, India |
| • Technical Lead at FOSS Society, an umbrella society housing the Firefox Community and Linux Users Group. | |
| • Founder and Club Lead at Linux Users Group, a group of enthusiastic users and learners of Linux. | |
| • Member of President’s Student Advisory Board, advising the president on student affairs. | |