

HARSH SHARMA

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RESEARCH SUMMARY

My general research interests are in artificial intelligence (AI) and machine learning (ML) with a focus on Design and Optimization of *Chiplet-based systems* for enabling high-performance computing. The overarching goal of my research is to develop principled AI-driven Design Paradigms in such huge-search spaces for efficient chip design geared towards high-impact applications. Specific topics include:

- Enabling Server-Scale system design with low-latency interconnect networks.
- Knowledge distillation with data-flow aware high-performance computing for Large Language Models.
- Design of high-performance and energy-efficient manycore systems to overcome Moore's law.
- Defect-aware integration using chiplet-based systems to reduce carbon footprint at scale.
- Accelerating the design of robust, reliable, and environmentally sustainable paradigms.

EDUCATION

Ph.D. Candidate, Computer Engineering, 3.96 GPA

Washington State University

2021–Present

Pullman, Washington

Bachelor of Engineering, Electronics and Communication Engineering

NSIT, Delhi University

2017–2021

New Delhi, India

Department ranker (Top 1%)

INDUSTRIAL EXPERIENCE

Machine Learning Research Intern

Lenskart.com

June 2020–December 2020

New Delhi, India

Developed AR tools with vision model to boost online sales by 35% during COVID19 Pandemic.

AWARDS AND HONORS

- Best Paper Candidate at ESWEK(Hamburg, Germany), 2023
- Best Paper Award at ESWEK(Phoenix/Shanghai), 2022 ¹
- DAC Richard Newton Young Fellow, 2022

SELECTED PUBLICATIONS

1. **Harsh Sharma**, Lukas Pfromm, Janardhan Rao Doppa, Umit Y. Ogras, Ananth Kalyanraman, Partha Pratim Pande. Network-on-Interposer Design for CNN Inferencing in Presence of Defective Chiplets. *ICCAD*, 2023. Under Review
2. **[Best Paper Candidate] Harsh Sharma**, Lukas Pfromm, Rasit Topaloglu, Janardhan Rao Doppa, Umit Y. Ogras, Ananth Kalyanraman, Partha Pratim Pande. Florets for Chiplets: Data Flow-aware High-Performance and Energy-efficient Network-on-Interposer for CNN Inference Tasks. *ESWEEK*, 2023.
3. **Harsh Sharma**, Sumit K. Mandal, Janardhan Rao Doppa, Umit Y. Ogras, Ananth Kalyanraman, Partha Pratim Pande. Achieving Datacenter-scale Performance through Chiplet-based Manycore Architectures. *DATE*, 2023.
4. **[Best Paper Award] Harsh Sharma**, Sumit K. Mandal, Janardhan Rao Doppa, Umit Y. Ogras, Ananth Kalyanraman, Partha Pratim Pande. SWAP: A Server-Scale Communication-Aware Chiplet-Based Manycore PIM Accelerator. *ESWEEK*, 2022.
5. **Harsh Sharma**, Dhananjay Gadre, Sangeeta Gadre, Smriti Srivastava. Science on a stick: An experimental and demonstration platform for learning several physical principles. *American Journal of Physics*, 2022.

¹<https://school.eecs.wsu.edu/2022/10/14/cases-best-paper-award/>

SELECTED PROFESSIONAL AND OUTREACH ACTIVITIES

Conferences and Invited Talks

- SWAP: A Server-scale Communication aware Chiplet-based PIM Accelerator at ESWEEK 2022.
- Achieving Datacenter-scale Performance through Chiplet-based Manycore Architectures at DATE 2023.
- Florets for Chiplets: Data Flow-aware High-Performance and Energy-efficient Network-on-Interposer for CNN Inference Tasks at ESWEEK-2023.
- Talk on *AI-Driven Design and Optimization of Chiplet-based Manycore Systems for Server-Scale Applications* at WSU Pullman-2023.
- Talk on *AI-Driven Design and Optimization strategies for more Moore* at NSIT Delhi (Virtual)-2023.
- Talk on *Accelerating the Future of Electronics* at Boston University (Virtual)-2023. ²

Reviewer

- ESWEEK 2022-Present, ICCAD 2023-Present, DAC 2022-Present, DATE 2022-Present

SKILLS

- **Programming Languages.** Python, Bash, C/C++, HTML/CSS, L^AT_EX, Java, MATLAB
- **Tools/Packages.** Git, SQL, PyTorch, TensorFlow, Python data science tools

²Based on <https://medium.com/@harshari/accelerating-the-future-of-electronics-e23cc42d9d39>