

Yifan Sun

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Academic Appointments

Assistant Professor

Computer Science, William & Mary

Williamsburg, VA

Aug. 2020 - Present

Education

Northeastern University

Ph.D. in Computer Engineering

Boston, MA

Sep. 2013-Aug. 2020

University at Buffalo

M.S. in Electrical Engineering

Buffalo, NY

Sep. 2011-Jun. 2013

Huazhong University of Science and Technology

B.Eng. in Electrical Engineering

Wuhan, China

Sep. 2007-Jun. 2011

Wuhan University

Bachelor in Business Administration (Minor)

Wuhan, China

Sep. 2008-Jun. 2011

Industry Experience

AMD, Software Engineer (Co-op)

Performance modeling and graphics simulator development for AMD Navi GPUs

Boxborough, MA

Jul. 2018-Dec.2018

Dell EMC, Software Engineer (Co-op)

Cloud-based GPU-as-a-service system design, development, and deployment

Hopkinton, MA

Jul. 2016-Dec.2016

Awards

2023 **Best Paper Award**, CHI'23

Hamburg, Germany

2020 **Best Paper Honorable Mention**, CHI'20

Honolulu, HI, USA

2019 **Outstanding Graduate Student in Experiential Learning**, Northeastern University

Boston, MA

2019 **Teaching Award**, Northeastern University College of Engineering

Boston, MA

2018 **Best Paper Award**, ICPE

Berlin, Germany

2016 **Best Paper Candidate**, IISWC

Providence, RI

2013 **Best Student Paper Award**, WUWNET

Kaohsiung, Taiwan

Grants and Supports

Underline—Myself

I have acquired research funding that totals \approx \$1.7M at William & Mary.

Advancing Tools and Resources for the AMD ROCm Platform

\$100K

AMD, Gift

Dec. 2024

PI: Yifan Sun

CAREER: Towards Next-Generation Human-in-the-Loop and Human-over-the-Loop Computer Architecture Performance Analysis Infrastructure	≈ \$600K
<i>NSF, CAREER</i>	Dec. 2024
<i>PI: <u>Yifan Sun</u></i>	
Enabling GPU Performance Simulation for Large-Scale Workloads with Lightweight Simulation Methods	≈ \$1.2M, W&M ≈ 376,000
<i>NSF, SHF Core, Medium</i>	Apr. 2023
<i>PI: <u>Yifan Sun</u>, Adwait Jog, Sreepathi Pai</i>	
Binary Instrumentation for GPU Programs on AMD Platforms.	\$50,000
<i>AMD, Gift, Sole PI</i>	Dec. 2023
HIP Development on AMD ROCm Platform.	\$50,000
<i>AMD, Gift, Sole PI</i>	Dec. 2023
The Methods of Profiling and Tracing of GPU Programs Running on AMD ROCm Platforms.	\$44,000
<i>AMD, Gift, Sole PI</i>	May. 2023
Building Explainable Architecture with Simulation and Visualization Techniques	\$175,000
<i>NSF, CRII, Sole PI</i>	Feb. 2023
Enabling Computer Architecture as a Service	\$100,000, W&M ≈ 73,000
<i>NSF, CCRI (later renamed as CIRC), Planning-C</i>	Feb. 2023
<i>PI: <u>Yifan Sun</u>, Katherine E. Issacs (University of Utah)</i>	
AMD ROCm and HIP Platform Development	\$60,000 + 2x AMD MI100 GPU
<i>AMD, Gift, Sole PI</i>	Mar. 2022
Exploring Interpretable Deep Learning from Information Theoretic Perspective: Modeling and Applications	Access to Cerebras Wafer-Scale Computing Devices
<i>Neocortex, Pittsburgh Supercomputing Center</i>	Feb. 2022
<i>PI: Huajie Shao, <u>Yifan Sun</u></i>	
Developing Infrastructure for Advancing Research and Teaching in Security and Reliability	\$79,670
<i>Coastal Virginia Center for Cyber Innovation (COVA CCI)</i>	Dec. 2021
<i>PI: Dmitry Evtyushkin, Co-PI: Evgenia Smirni, <u>Yifan Sun</u>, Adwait Nadkarni</i>	
AMD ROCm and HIP Platform Development	\$40,000
<i>AMD, Gift, Sole PI</i>	Sep. 2021
General-Purpose Computing with AMD Graphics Processors	\$40,000
<i>AMD, Gift, Sole PI</i>	Apr. 2021

Publications

Underline—Myself

Wavy Underline—William & Mary Student

Journal or Peer-Reviewed Conference Papers

1. Matin Raayai Ardakani, Andrew Nguyen, Ivan Rosales, Daoxuan Xu, Yuwei Sun, Yifan Sun, David Kaeli, Norm Rubin. 2025. **Sibir: A Dynamic Binary Instrumentation Framework Targeting AMD GPUs**. In Proceedings of the 2025 IEEE

International Symposium on Performance Analysis of Systems and Software (ISPASS 2025). Ghent, Belgium. [Acceptance Rate $28/99 \approx 28\%$]

2. Wenhan Lyu, Shuang Zhang, Tingting (Rachel) Chuang, Yifan Sun, Yixuan Zhang. 2025. **Understanding the Practices, Perceptions, and (Dis)Trust of Generative AI among Instructors: A Mixed-methods Study in the U.S. Higher Education**. Computers and Education: Artificial Intelligence.
3. Ali Mosallaei, Katherine Isaacs, Yifan Sun. 2024. **Looking into the Black Box: Monitoring Computer Architecture Simulations in Real-Time with AkitaRTM**. In Proceedings of the 57th IEEE/ACM International Symposium on Microarchitecture. IEEE/ACM. Austin, Texas, USA. [Acceptance Rate $113/489 \approx 22.7\%$]
4. Wenhan Lyu, Yimeng Wang, Tingting Rachel Chung, Yifan Sun, Yixuan Zhang. 2024. **Evaluating the Effectiveness of LLMs in Introductory Computer Science Education: A Semester-Long Field Study**. In Proceedings of the Eleventh ACM Conference on Learning @ Scale (L@S '24). ACM. Atlanta, Georgia, USA. [Acceptance rate: $22/90 \approx 24.4\%$]
5. Yichen Luo, Daoxuan Xu, Gang Zhou, Yifan Sun, Sidi Lu. 2024. **Impact of Raindrops on Camera-Based Detection in Software-Defined Vehicles**. 2nd IEEE International Conference on Mobility: Operations, Services, and Technologies (MOST '24)
6. Shaoyu Wang (co-first author), Hang Yan (co-first author), Katherine E. Isaacs, Yifan Sun. 2023. **Visual Exploratory Analysis for Designing Large-Scale Network-on-Chip Architectures: A Domain Expert-Led Design Study**. IEEE Transactions on Visualization and Computer Graphics (TVCG) 01 (2023), 1-13.
7. Ying Li, Yifan Sun, Adwait Jog. 2023. **Path Forward Beyond Simulators: Fast and Accurate DNN Execution Time Prediction**. The 56th IEEE/ACM International Symposium on Microarchitecture (MICRO '23). IEEE/ACM. Toronto, Canada, 13 pages. [Acceptance rate: $101/424 \approx 23.8\%$]
8. Changxi Liu, Yifan Sun, Trevor E. Carlson. 2023. **Photon: A Fine-grained Sampled Simulation Methodology for GPU Workloads**. The 56th IEEE/ACM International Symposium on Microarchitecture (MICRO '23). IEEE/ACM. Toronto, Canada, 13 pages. [Acceptance rate: $101/424 \approx 23.8\%$]
9. 🏆 [Best Paper Award (Top 1%)] Yixuan Zhang, Joseph D Gaggiano, Nutchanon Yongsatianchot, Nurul Suhaimi, Miso Kim, Yifan Sun, Jacqueline Griffin, and Andrea G. Parker. 2023. **What Do We Mean When We Talk about Trust in Social Media? A Systematic Review**. In ACM CHI Conference on Human Factors in Computing Systems (CHI '23).
10. Yixuan Zhang, Yifan Sun, Joseph D Gaggiano, Neha Kumar, Clio Maria Adris, and Andrea G Parker. 2022. **Visualization Design Practices in a Crisis: Behind the Scenes with COVID-19 Dashboard Creators**. IEEE Transactions on Visualization and Computer Graphics (IEEEVis '22). [Acceptance rate: $122/460 \approx 26.5\%$]
11. Yixuan Zhang, Nurul Suhaimi, Nutchanon Yongsatianchot, Joseph D Gaggiano, Miso Kim, Shivani A Patel, Yifan Sun, Stacy Marsella, Jacqueline Griffin, and Andrea G Parker. 2022. **Shifting Trust: Examining How Trust and Distrust Emerge, Transform, and Collapse in COVID-19 Information Seeking**. In CHI Conference on Human Factors in Computing Systems (CHI '22), April 29-May 5, 2022, New Orleans, LA, USA. ACM, New York, NY, USA, 21 pages. [Top 12.5%; Acceptance rate: $638/2597 \approx 24.6\%$]
12. Yuhui Bao, Yifan Sun, Zlatan Feric, Michael Tian Shen, Micah Weston, José L Abellán, Trinayan Baruah, John Kim, Ajay Joshi, David Kaeli. 2022. **NaviSim: A Highly Accurate GPU Simulator for AMD RDNA GPUs**. The 31st International Conference on Parallel Architectures and Compilation Techniques (PACT '22). ACM. Chicago, IL, USA, 13 pages. [Acceptance rate: $50/118 \approx 42.4\%$]
13. Yifan Sun, Yixuan Zhang, Ali Mosallaei, Michael D. Shah, Cody Dunne, David Kaeli. 2021. **Daisen: A Framework for Visualizing Detailed GPU Execution**. The 23rd EG Conference on Visualization (EuroVis '21). [Acceptance Rate $\approx 26.0\%$]
14. Shi Dong, Yifan Sun, Nicolas Bohm Agostini, Elmira Karimi, Daniel Lowell, Jing Zhou, José Cano, José L. Abellán, David Kaeli. 2021. **Spartan: A Sparsity-Adaptive Framework to Accelerate Deep Neural Network Training on GPUs**. IEEE Transactions on Parallel and Distributed Systems (TPDS) 32, 10 (October 2021), 2448-2463.

15. Trinayan Baruah, Kaustubh Shivdikar, Shi Dong, [Yifan Sun](#), Saiful A. Mojumder, Kihoon Jung, José L. Abellán, Yash Ukidave, Ajay Joshi, John Kim, David Kaeli. 2021. **GNNMark: A Benchmark Suite to Characterize Graph Neural Network Training on GPUs**. 2021 IEEE International Symposium on Performance Analysis of Systems and Software (ISPASS '21). IEEE. Stony Brook, NY, USA, 13-23. [Acceptance rate \approx 36.9%]
16. Yixuan Zhang, [Yifan Sun](#), Lacey Padilla, Submit Barua, Enrico Bertini, Andrea G. Parker. 2021. **Mapping the Landscape of COVID-19 Crisis Visualizations**. The ACM conference on Human Factors in Computing Systems (CHI '21). ACM. [Acceptance rate \approx 26.3%]
17. 🏆 [Best Paper Honorable Mention (<5%)] Omid Mohaddesi, [Yifan Sun](#), Rana Azghandi, Rozhin Doroudi, Sam Snodgrass, Ozlem Ergun, Jacqueline Griffin, David Kaeli, Stacy Marsella, Casper Hartevelde. 2020. **Introducing Gamettes: A Playful Approach for Capturing Decision-Making for Informing Behavioral Models**. The ACM Conference on Human Factors in Computing Systems (CHI '20). ACM. Honolulu, HI, USA, 1-13. [Acceptance rate \approx 24.3%]
18. Rozhin Doroudi, Pedro Sequeira, Stacy Marsala, Ozlem Ergun, Rana Azghandi, David Kaeli, [Yifan Sun](#), Jacqueline Griffin. 2019. **Effects of Trust-Based Decision Making in Disrupted Supply Chains**. PLoS One 15, no. 2 (2020): e0224761
19. Trinayan Baruah, [Yifan Sun](#), Saiful A. Mojumder, José L. Abellán, Yash Ukidave, Ajay Joshi, Norman Rubin, John Kim, David Kaeli. 2020. **Valkyrie: Leveraging Inter-TLB Locality to Enhance GPU Performance**. In Proceedings of the 29th International Conference on Parallel Architectures and Compilation Techniques (PACT '20). ACM. Atlanta, GA, USA, 455-466. [Acceptance rate \approx 25.9%]
20. Trinayan Baruah, [Yifan Sun](#), Ali Tolga Dinçer, Saiful A. Mojumder, José Luis Abellán, Yash Ukidave, Ajay Joshi, Norman Rubin, John Kim, David Kaeli. 2020. **Griffin: Hardware-Software Support for Efficient Page Migration in Multi-GPU Systems**. In Proceedings of the 26th IEEE International Symposium on High-Performance Computer Architecture (HPCA '20). IEEE. San Diego, CA, USA, 596-609. [Acceptance rate \approx 19.4%]
21. Chen Li, [Yifan Sun](#), Lingling Jin, Lingjie Xu, Zheng Cao, Pengfei Fan, David Kaeli, Sheng Ma, Yang Guo, and Jun Yang. 2019. **Priority-Based PCIe Scheduling for Multi-Tenant Multi-GPU System**. IEEE Computer Architecture Letters (CAL) 18, 2 (July-Dec. 1 2019), 157-160.
22. [Yifan Sun](#), Trinayan Baruah, Saiful A. Mojumder, Shi Dong, Xiang Gong, Shane Treadway, Yuhui Bao, Spencer Hance, Carter McCardwell, Vincent Zhao, Harrison Barclay, Amir Kavayan Ziabari, Zhongliang Chen, Rafael Ubal, José L. Abellán, John Kim, Ajay Joshi, and David Kaeli. 2019. **MGPUSim: Enabling Multi-GPU Performance Modeling and Optimization**. In Proceedings of the 46th International Symposium on Computer Architecture (ISCA '19). ACM, New York, NY, USA, 197-209. [Acceptance rate \approx 17.0%]
23. Mohammad Khavari Tavana, [Yifan Sun](#), Nicolas Bohm Agostini, and David Kaeli. 2019. **Exploiting Adaptive Data Compression to Improve Performance and Energy-Efficiency of Compute Workloads in Multi-GPU Systems**. In Proceedings of the 33rd IEEE International Parallel and Distributed Processing Symposium (IPDPS '19). IEEE, Rio de Janeiro, Brazil, 664-674 [Acceptance rate \approx 27.7%]
24. Saiful A Mojumder, Marcia S Louis, [Yifan Sun](#), Amir Kavayan Ziabari, José L Abellán, John Kim, David Kaeli, and Ajay Joshi. 2018. **Profiling DNN Workloads on a Volta-based DGX-1 System**. In Proceedings of the 2018 IEEE International Symposium on Workload Characterization (IISWC '18). IEEE, Raleigh, North Carolina, USA, 122-133. [Acceptance rate \approx 36.2%]
25. Rozhin Doroudi, Rana Azghandi, Zlatan Feric, Omid Mohaddesi, [Yifan Sun](#), Jacqueline Griffin, Ozlem Ergun, David Kaeli, Pedro Sequeira, Stacy Marsella, and Casper Hartevelde. 2018. **An Integrated Simulation Framework for Examining Resiliency in Pharmaceutical Supply Chains Considering Human Behavior**. In Proceedings of the 2018 Winter Simulation Conference (WSC '18). ACM, Gothenburg, Sweden, 88-99. [Acceptance rate \approx 70.4%]
26. [Yifan Sun](#), Saoni Mukherjee, Trinayan Baruah, Shi Dong, Julian Gutierrez, Prannoy Mohan, and David Kaeli. 2018. **Evaluating Performance Tradeoffs on the Radeon Open Compute Platform**. In Proceedings of the 2018 IEEE International Symposium on Performance Analysis of Systems and Software (ISPASS '18). IEEE, Belfast, Northern Ireland, United Kingdom, 209-218. [Acceptance rate \approx 31.3%]

27. 🏆 [Best Paper Award] Shi Dong, Gong Xiang, Yifan Sun, Trinayan Baruah, and David Kaeli. 2018. **Characterizing the Microarchitectural Implications of a Convolutional Neural Network (CNN) on GPUs**. In Proceedings of the 2018 ACM International Conference on Performance Engineering (ICPE '18). ACM, Berlin, Germany, 96-106. [Acceptance rate = 24.0%]
28. Trinayan Baruah, Yifan Sun, Shi Dong, David Kaeli, and Norm Rubin. 2018. **Airavat : Improving Energy Efficiency of Heterogeneous Applications**. In Proceedings of the 2018 Design, Automation & Test in Europe Conference & Exhibition (DATE '18). IEEE, Dresden, Germany, 731-736. [Acceptance rate \approx 24.2%]
29. Leiming Yu, Xun Gong, Yifan Sun, Qianqian Fang, Norm Rubin, and David Kaeli. 2017. **Moka: Model-based Concurrent Kernel Analysis**. In Proceedings of the 2017 IEEE International Symposium on Workload Characterization (IISWC '17). IEEE, Seattle, Washington, USA, 197-206. [Acceptance rate \approx 27.7%]
30. 🏆 [Best Paper Candidate] Yifan Sun, Xiang Gong, Amir Kavvan Ziabari, Leiming Yu, Xiangyu Li, Saoni Mukherjee, Carter McCardwell, Alejandro Villegas, and David Kaeli. 2016. **Hetero-Mark, a Benchmark Suite for CPU-GPU Collaborative Computing**. In Proceedings of the 2016 IEEE International Symposium on Workload Characterization (IISWC '16). IEEE, Providence, Rhode Island, USA, 1-10. [Acceptance rate \approx 30.4%]
31. Yifan Sun, Chisheng Liang, Steven Sutherland, Casper Hartevelde, and David Kaeli. 2016. **Modeling Player Decisions in a Supply Chain Game**. In Proceedings of the 2016 IEEE Conference on Computational Intelligence and Games (CIG '16). IEEE, Santorini, Greece, 1-8. [Acceptance rate unknown]
32. Saoni Mukherjee, Yifan Sun, Paul Blinzer, Amir Kavvan Ziabari, and David Kaeli. 2016. **A Comprehensive Performance Analysis of HSA and OpenCL 2.0**. In Proceedings of the 2016 IEEE International Symposium on Performance Analysis of Systems and Software (ISPASS '16). IEEE, Uppsala, Sweden, 183-193. [Acceptance rate \approx 35.1%]
33. Amir Kavvan Ziabari, Yifan Sun, Yenai Ma, Dana Schaa, José L. Abellán, Rafael Ubal, John Kim, Ajay Joshi, and David Kaeli. 2016. **UMH: A Hardware-based Unified Memory Hierarchy for Systems with Multiple Discrete GPUs**. ACM Transactions on Architecture and Code Optimization (TACO) 13, 4 Article 35 (December 2016), 25 pages.
34. Abdulla K. Al-Ali, Yifan Sun, Marco Di Felice, Jarkko Paavola, and Kaushik R. Chowdhury. 2015. **Accessing Spectrum Databases using Interference Alignment in Vehicular Cognitive Radio Networks**. IEEE Transactions on Vehicular Technology 64, 1 (2014), 263-272.
35. Yifan Sun, and Kaushik R. Chowdhury. 2015. **Enabling Emergency Communication through a Cognitive Radio Vehicular Network**. IEEE Communications Magazine 52, 10 (2014), 68-75.
36. Jithin Jagannath, Anu Saji, Hovannes Kulhandjian, Yifan Sun, Emrehan Demirors, and Tommaso Melodia. 2013. **A Hybrid MAC Protocol with Channel-Dependent Optimized Scheduling for Clustered Underwater Acoustic Sensor Networks**. In Proceedings of the 8th ACM International Conference on Underwater Networks and Systems (WUWNET '13). ACM, Kaohsiung, Taiwan, Article 3, 8 pages. [Acceptance rate = 20.0%]
37. 🏆 [Best Student Paper Award] Yifan Sun, and Tommaso Melodia. 2013. **The internet underwater: An IP-compatible Protocol Stack for Commercial Undersea Modems**. In Proceedings of the 8th ACM International Conference on Underwater Networks and Systems (WUWNET '13). ACM, Kaohsiung, Taiwan, Article 37, 8 pages. [Acceptance rate = 20.0%]

Books

1. Yifan Sun, Sabila Al Jannat, Trinayan Baruah, and David Kaeli. 2024. **(In Progress) Accelerated Computing with HIP, rev. 2**.
1. Ифань Сун, Тринайан Баруа, Дэвид Кээли. 2024. **ВЫСОКОПРОИЗВОДИТЕЛЬНЫЕ ВЫЧИСЛЕНИЯ С ПОМОЩЬЮ HIP** (The Russian translation of the book Accelerated Computing with HIP, as part of the Supercomputing Education Series), Moscow University Press.
1. Yifan Sun, Trinayan Baruah, and David Kaeli. 2022. **Accelerated Computing with HIP**. ISBN:979-8218107444.

Book Chapters

1. Shih-Hao Hung, Thomas B. Jablin, [Yifan Sun](#), Rafael Ubal, and David Kaeli. 2015. **HSA Simulators**. A book chapter in Heterogeneous System Architecture: Practical Applications for Industry, 1st edition, Elsevier.

Patents

1. Junping Zhao, [Yifan Sun](#), Layne Peng, Jie Bao, Kun Wang. (Jan. 2021). **Intelligent data coordination for accelerated computing in cloud environment**. Patent No. US 10,891,156, Filed Apr 26, 2017, Issued Jan 12, 2021.
2. [Yifan Sun](#), Layne Peng, Robert A. Lincourt JR., John Cardente, and Junping Zhao. (Jun. 2019). **Managing access to a resource pool of graphics processing units under fine grain control**. Patent No. US 10,262,390, Filed Apr 14, 2017, Issued Jun 27, 2019.
3. Junping Zhao, Layne Peng, Jie Bao, Kun Wang, and [Yifan Sun](#). (Apr. 2019). **Checkpointing for GPU-as-a-Service in Cloud Computing Environment**, Patent No. US 10,275,851, Filed Apr 25, 2017, Issued Apr 30, 2019.
4. [Yifan Sun](#), Layne Peng, Robert A. Lincourt JR., John Cardente, John S Harwood. (Oct. 2018). **Queue-based GPU Virtualization and Management System**. Patent No. US 10,109,030, Filed Dec 27, 2016, Issued Oct 23, 2018.

Workshop or Poster Publications

1. [Daoxuan Xu](#), Le Xu, Jie Ren, [Yifan Sun](#). 2025. **Exploring the Wafer-Scale GPUs**. The 17th Workshop on General Purpose Processing using GPU (GPGPU 2025).
2. Nicolás Meseguer, [Yifan Sun](#), Michael Pellauer, José L. Abellán and Manuel E. Acacio. 2025. **ACTA: Automatic Configuration of the Tensor Memory Accelerator for High-End GPUs**. The 17th Workshop on General Purpose Processing using GPU (GPGPU 2025).
3. [Chris Thames](#), [Yifan Sun](#). 2024. **A Survey of Artificial Intelligence Approaches to Safety and Mission-Critical Systems**. The 24th Integrated Communications, Navigation and Surveillance Conference (ICNS 2024).
4. [Ying Li](#), Yuhui Bao, Pranav Vaid, Gongyu Wang, Adwait Jog, Darius Bunandar, Ajay Joshi, [Yifan Sun](#). 2023. **TraceSim: a Lightweight Simulator for Large-Scale DNN Workloads on Multi-GPU Systems**. The First Workshop on Computer Architecture Modeling and Simulation (CAMS 2023).
5. Ali Mosallaei, Katherine Isaacs, [Yifan Sun](#). 2023. **Looking into the Black Box: Monitoring Computer Architecture Simulations in Real-Time with AkitaRTM**. The First Workshop on Computer Architecture Modeling and Simulation (CAMS 2023).
6. [Ying Li](#), [Yifan Sun](#), Adwait Jog. 2023. **A Regression-based Model for End-to-End Latency Prediction for DNN Execution on GPUs**. 2023 IEEE International Symposium on Performance Analysis of Systems and Software (ISPASS 2023).
7. [Chris Thames](#), Hang Yan, [Yifan Sun](#). 2022. **Understanding Wafer-Scale GPU Performance using an Architectural Simulator**. The 14th Workshop on General Purpose Processing using GPU (GPGPU 2022).
8. Yixuan Zhang, [Yifan Sun](#), Sumit Barua, Enrico Bertini, and Andrea Grimes Parker. 2020. **Mapping the Landscape of COVID-19 Crisis Visualizations**. Visualization for Communication (VisComm).
9. [Yifan Sun](#), Trinayan Baruah, Shi Dong, and David Kaeli. 2019. **MGSim: A Flexible High-Performance Simulator for Multi-GPU Systems**. International Workshop on OpenCL (IWOCCL).

Preprints

1. Saiful A. Mojumder, [Yifan Sun](#), Leila Delshadtehrani, Yenai Ma, Trinayan Baruah, José L. Abellán, John Kim, David Kaeli, Ajay Joshi. 2020. **MGPU-TSM: A Multi-GPU System with Truly Shared Memory**. arXiv preprint arXiv:2008.02300.

2. Saiful A. Mojumder, [Yifan Sun](#), Leila Delshadtehrani, Yenai Ma, Trinayan Baruah, José L. Abellán, John Kim, David Kaeli, Ajay Joshi. 2020. **HALCONE : A Hardware-Level Timestamp-Based Cache Coherence Scheme for Multi-GPU Systems**. arXiv preprint arXiv:2007.04292.
3. [Yifan Sun](#), Nicolas Bohm Agostini, Shi Dong, and David Kaeli. 2019. **Summarizing CPU and GPU Design Trends with Product Data**. arXiv preprint arXiv:1911.11313.
4. [Yifan Sun](#), Trinayan Baruah, Saiful A Mojumder, Shi Dong, Rafael Ubal, Xiang Gong, Shane Treadway, Yuhui Bao, Vincent Zhao, José Luis Abellán, John Kim, Ajay Joshi, and David Kaeli. 2019. **MGSim+MGMark: A Framework for Multi-GPU System Research**. arXiv preprint arXiv:1811.02884.

Open-Source Software & Datasets

1. **The CHIP Dataset** <https://chip-dataset.vercel.app>
Dataset with 2185 CPUs and 2668 GPUs.
Help researchers understand the semiconductor development trends.
2. **Daisen (now part of Akita)**
General purpose visualization tool that reveals the detailed behavior of hardware components.
3. **MGPUSim** <https://github.com/sarchlab/mgpusim>
Multi-GPU system simulator based on AMD GCN3 GPUs.
4. **Akita** <https://github.com/sarchlab/akita>
High-flexibility, high-performance, parallel computer architecture simulation framework.
5. **Hetero-Mark** <https://github.com/NUCAR-DEV/Hetero-Mark>
Benchmark suite for CPU-GPU collaborative computing.
6. **Drug Supply Chain Simulator** <https://gitlab.com/syifan/crisp>
Human-in-the-loop logistics simulator for the U.S. drug supply chain.
7. **VistaLights** <https://github.com/syifan/VistaLights>
Strategic game for maritime traffic management and disaster relief.

Talks and Tutorials

1. **User-Friendly Tools in Akita 3.0**
The 2nd Workshop on Computer Architecture Modeling and Simulation (CAMS '24). November 2024.
2. **On the Human Side of Computer Architecture, Towards Explainable Architecture**
North Carolina State University. October 2024.
3. **Towards Building Explainable Computer Architecture**
Lehigh University. Feb 2023.
4. **MGPUSim: A One-Stop Solution for GPU Architecture Simulation**
The 2020 International Conference on High Performance Computing & Simulation (HPCS '20). Jan 2021.
5. **MGPUSim: A High-Flexibility, High-Performance, Multi-GPU Simulator**
Alibaba. July 2020.
6. **Exploring Multi-GPU Simulation and Visual Profiling with MGPUSim**
With José L. Abellán, Trinayan Baruah, and David Kaeli. Tutorial at ISCA 2020. May 2020.
7. **Collaborative Heterogeneous Computing**
William & Mary. March 2020.
University of California, Santa Cruz. March 2020.

University of Pittsburgh. March 2020.
University of Central Florida. March 2020.

8. **Tutorial on the Akita Simulator Framework and MGPUSim**
With Trinayan Baruah, Shi Dong, and David Kaeli. Tutorial at HPCA 2020. February 2020.
9. **Research in the NUCAR Laboratory at Northeastern University**
FutureWei. With David Kaeli. July 2019.
10. **MGPUSim: a Flexible High-Performance Simulator for Multi-GPU Systems**
International Workshop on OpenCL (IWOCCL). May 2019.
11. **AKITA: A Go-Based Computer Architecture Simulator Framework**
Google. May 2019.
12. **Enabling Multi-GPU High Performance Computing with Memory System Design**
Lighting talk at Boston University Red Hat Collaboratory. February 2019.
13. **Benchmarking the New Unified Memory of CUDA 8**
With Frank Zhao. GTC 2017 San Jose. August 2017.
14. **Multi2Sim 5.0**
Tutorial at IISWC 2016. September 2016.

Teaching

Teaching @ William & Mary

CSCI654: Advanced Computer Architecture Instructor Graduate level, new course	Spring 2025
CSCI432: Web Programming Instructor Senior undergrad-level course, new course	Fall 2024
CSCI780: Computer Architecture Modeling and Simulation Instructor Ph.D.-level course, new course	Spring 2023
CSCI780: Data Visualization Instructor Ph.D.-level course, new course	Spring 2022, 2024
CSCI780: Topics in Computer Architecture Instructor Ph.D.-level course, new course	Spring 2021
CSCI141: Computational Problem Solving Instructor Undergraduate's first Python programming course (1st - 2nd year)	Fall 2020-2023

Teaching @ Northeastern University

EECE2322: Fundamental Digital Design and Computer Organization	Fall 2019
Co-instructor. With Dr. Pereira da Silva Aloizio	
Intermediate-level undergraduate course (3rd year)	
EECE2560: Fundamentals of Engineering Algorithms	Spring 2018
Instructor	
Intermediate-level undergraduate course (3rd year)	
Redesigned the course (“I have learned a lot in this course”: 4.7 out of 5)	
Instructor effectiveness 4.4 out of 5	
EECE2160: Embedded Design Enabling Robotics	Fall 2017
Instructor	
Intermediate-level undergraduate course (2nd year)	
Instructor effectiveness 4.6 out of 5	

Student Mentees

Ph.D. Students

Yijia Shi		William & Mary	2024-current
Enze Xu		William & Mary	2024-current
Daoxuan Xu		William & Mary	2023-current
Sabila Al Jannat		William & Mary	2022-current
Ying Li	Co-advised with Adwait Jog	William & Mary	2021-current
Chris Thames	Part-time, with full-time job at NASA	William & Mary	2020-current

Master Researchers

Daoxuan Xu	University of Florida	2020-current
Yuhui Bao	Northeastern University	2018-2020

Undergraduate Researchers

William & Mary
Zhuoyan Zheng, Mengyang He, Pablo Ibarz Aibo Li, Yexi Zheng, Xuzhong Wang, Huizhi Zhao,

University of Michigan, Ann Arbor
Ali Mosallaei

Huazhong University of Science & Technology (China)
Shaoyu Wang, Hang Yan, Chen Gong

Istanbul Technical University (Turkey)
Ali Tolga Dinçer

REU Student
Xin Li

Selected Media Coverage

William & Mary News Books published by William & Mary faculty in 2023	2023
FiveThirtyEight The Datasets We're Looking At This Week (The CHIP dataset is highlighted by the "Data Is Plural" column at FiveThirtyEight)	2022
William & Mary News Misinformation examination: How trust and distrust shift during COVID-19	2022
WYDaily W&M Professor Helps Medical Experts Study COVID-19 With GPUs	2021
William & Mary News Sun is Teaching COVID-19 Researchers How to Use High-Performance AMD Computers	2021
HiPEAC info 58 MGPU Sim announced at ISCA 2019	2019
News@Northeastern College of Engineering Yifan Sun and NUCAR Research Lab featured in HiPEAC News	2019
News@Northeastern A Student Went off to Do a Co-op at a Major Tech Firm. He Came Back With a Patent.	2018
WIRED Finally, the Underwater We've All Been Waiting For	2013
NBC News Deep-sea Internet to Detect Tsunamis, Spy on Smugglers, and Discover Oil	2013

Service

Ph.D. Dissertation Committee

Lishan Yang	Joined GMU as Assistant Prof.	William & Mary	Defended in Spring 2022
Yuhui Bao	First Job @ AMD Inc.	Northeastern University	
Matin Raayai		Northeastern University	

Master Thesis Committee

Jiangtao Kong	Continued Ph.D. study at W&M	William & Mary	Defended in Spring 2023
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Chair 17th Workshop on General Purpose Processing Using GPU (GPGPU '25)	2025
Artifact Evaluation Chair 2025 IEEE International Symposium on Workload Characterization (IISWC '25)	2025
Program Committee 31th IEEE International Symposium on High-Performance Computer Architecture (HPCA '25)	2025
External Review Committee 2025 IEEE International Symposium on Performance Analysis of Systems and Software (ISPASS '25)	2025
Chair 2nd Workshop on Computer Architecture Modeling and Simulation (CAMS '24) 16th Workshop on General Purpose Processing Using GPU (GPGPU '24)	2024

Program Committee	2024
21th ACM International Conference on Computing Frontiers (CF' 24)	
30th IEEE International Symposium on High-Performance Computer Architecture (HPCA '24)	
6th Workshop on Accelerated Machine Learning (AccML '24)	
42nd IEEE International Conference on Computer Design (ICCD '24)	
External Review Committee	2024
The 51st International Symposium on Computer Architecture (ISCA '24)	
Ad-hoc Reviewer	2024
IEEE 17th Pacific Visualization Symposium (PacificVis '24)	
Journal Reviewer	2024
Transactions on Cloud Computing	
Chair	2023
1st Workshop on Computer Architecture Modeling and Simulation (CAMS '23)	
15th Workshop on General Purpose Processing Using GPU (GPGPU '23)	
Program Committee	2023
41st IEEE International Conference on Computer Design (ICCD '23)	
20th ACM International Conference on Computing Frontiers (CF '23)	
5th Workshop on Accelerated Machine Learning (AccML '23)	
IEEE International Symposium on High-Performance Computer Architecture (HPCA '23)	
Journal Reviewer	2023
Journal of Parallel and Distributed Computing (JPDC)	
ACM Transactions on Architecture and Code Optimization (TACO)	
Co-Chair	2022
14th Workshop on General Purpose Processing Using GPU (GPGPU '22)	
Workshop/Tutorial Chair	2023
IEEE International Symposium on High-Performance Computer Architecture (HPCA '23)	
Panelist	2022
NSF CISE Office of Advanced Cyberinfrastructure (OAC)	
Program Committee	2022
International Symposium on Computer Architecture and High Performance Computing (SBAC-PAD '22)	
40th IEEE International Conference on Computer Design (ICCD '22)	
4th Workshop on Accelerated Machine Learning (AccML '22)	
Journal Reviewer	2022
Transaction on Modeling and Performance Evaluation of Computing Systems (TOMPECS)	
ACM Transactions on Architecture and Code Optimization (TACO)	
Future Generation Computer Systems (FGCS)	
40 thIEEE Transactions on Very Large Scale Integration Systems (TPDS)	
IEEE Micro	
Program Committee	2021
IEEE International Symposium on Computer Architecture and High Performance Computing (SBAC-PAD '21)	
40th IEEE International Conference on Computer Design (ICCD '21)	

Journal Reviewer	2021
IEEE Transactions on Parallel and Distributed Systems (TPDS)	
ACM Transactions on Architecture and Code Optimization (TACO)	
IEEE Computer Architecture Letters (CAL) ×2	
Program Committee	2020
39th IEEE International Conference on Computer Design (ICCD '20)	
13th Workshop on General Purpose Processing Using GPU (GPGPU '20)	
Journal Reviewer	2020
Journal of Parallel and Distributed Computing (JPDC)	
IEEE Transactions on Parallel and Distributed Systems (TPDS)	
IEEE Transactions on Computers (TOC)	
ACM Transactions on Architecture and Code Optimization (TACO)	
Web Chair	2016
6th Workshop on General Purpose Processing Using GPU (GPGPU '16)	

Service @ William & Mary

CS Major Advisor	2023-2024
Mengyan He	
Zhuoyan Zheng	
Daniel Seo	
Aibo Li	
Pre-Major Advisor	2024-2025
7 students	
Chair	2024-2025
Computer Science Department Web Presence Committee	
Computer Science Department Graduate Recruiting Committee	
Member	2024-2025
Computer Science Department Colloquium Committee	
Pre-Major Advisor	2023-2024
8 students	
Member of University-Wide Committees	2023-2024
Generative AI University Teaching & Learning Project (UTLP)	
Chair	2023-2024
Computer Science Department Web Presence Committee	
Member of Committees in the Computer Science Department	2023-2024
Colloquium	
Graduate Recruiting	
Member of University-Wide Committees	2022-2023
S. Laurie Sanderson Awards for Excellence in Undergraduate Mentoring Committee	
Research Computing Advisory Committee	

CS Major Advisor Srikar G. Vadgantam	2022-2023
Pre-Major Advisor 10 students	2022-2023
Chair Computer Science Department Web Presence Committee	Spring 2023
Co-chair Computer Science Department Web Presence Committee	Fall 2022
Member of Committees in the Data Science Department Faculty Recruitment Committee	2022-2023
Member of Committees in the Computer Science Department Colloquium Committee Graduate Admissions Committee Graduate Recruiting Committee System Committee	2022-2023
Member of Committees in the Computer Science Department Colloquium Committee Graduate Admissions Committee Graduate Recruiting Committee System Committee	2022-2023
CS Major Advisor Ryan Thomas Gainor	2022-2023
Pre-Major Advisor 6 students	2021-2022
Member of University-Wide Committees S. Laurie Sanderson Awards for Excellence in Undergraduate Mentoring Committee	2021-2022
Member of Committees in the Computer Science Department Undergraduate Curriculum Committee Web Presence Committee	2021-2022