

# Yifan Sun

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## Academic Appointments

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### Assistant Professor

Computer Science, William & Mary

Williamsburg, VA

Aug. 2020 - Present

## Education

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### 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

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### 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

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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

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### 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, Sole PI

Dec. 2024

### CAREER: Towards Next-Generation Human-in-the-Loop and Human-over-the-Loop

$\approx$  \$600K

Computer Architecture Performance Analysis Infrastructure

NSF, CAREER, , Sole PI

Dec. 2024

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

## Publications

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Underline—Myself

Wavy Underline—William & Mary Student

### Journal or Peer-Reviewed Conference Papers

1. [Ying Li](#), Yuhui Bao, Gongyu Wang, Xinxin Mei, Pranav Vaid, Anandaroop Ghosh, Adwait Jog, Darius Bunandar, Ajay Joshi, [Yifan Sun](#). 2025. **TrioSim: A Lightweight Simulator for Large-Scale DNN Workloads on Multi-GPU Systems**. In Proceedings of the 52nd International Symposium on Computer Architecture (ISCA 2025). Tokyo, Japan. [Acceptance Rate 132/570 ≈ 23.2%]
2. Amel Fatima, Yang Yang, [Yifan Sun](#), Rachata Ausavarungnirun, Adwait Jog. 2025. **NetCrafter: Tailoring Network Traffic for Non-Uniform Bandwidth Multi-GPU Systems**. In Proceedings of the 52nd International Symposium on Com-

puter Architecture (ISCA 2025). Tokyo, Japan. [Acceptance Rate 132/570  $\approx$  23.2%]

3. Changxi Liu, Miao Yu, Yifan Sun, Trevor E. Carlson. 2025. **The Sparsity-Aware LazyGPU Architecture**. In Proceedings of the 52nd International Symposium on Computer Architecture (ISCA 2025). Tokyo, Japan. [Acceptance Rate 132/570  $\approx$  23.2%]
4. 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%]
5. 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.
6. 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%]
7. 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%]
8. 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)
9. 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.
10. 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%]
11. 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%]
12. 🏆 [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).
13. 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%]
14. 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%]
15. 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%]

16. [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%]
17. 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.
18. 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%]
19. 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%]
20. 🏆 [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%]
21. 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
22. 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%]
23. 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%]
24. 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.
25. [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%]
26. 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%]
27. 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%]
28. 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 Exam-**

- ining 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%]
29. [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%]
  30. 🏆 [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%]
  31. 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%]
  32. 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%]
  33. 🏆 [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%]
  34. [Yifan Sun](#), Chisheng Liang, Steven Sutherland, Casper Harteveld, 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]
  35. 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%]
  36. 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.
  37. 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.
  38. [Yifan Sun](#), and Kaushik R. Chowdhury. 2015. **Enabling Emergency Communication through a Cognitive Radio Vehicular Network**. IEEE Communications Magazine 52, 10 (2014), 68-75.
  39. Jithin Jagannath, Anu Saji, Hovannes Kulhandjian, [Yifan Sun](#), Emre Can 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%]
  40. 🏆 [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 Buruah, and David Kaeli. 2024. **(In Progress) Accelerated Computing with HIP**, rev. 2.
1. Ифань Сун, Тринайан Баруа, Дэвид Каэли. 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 Buruah, 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

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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

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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

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### Teaching @ William & Mary

<b>CSCI654: Advanced Computer Architecture</b> Instructor Graduate level, new course	Spring 2025
<b>CSCI432: Web Programming</b> Instructor Senior undergrad-level course, new course	Fall 2024
<b>CSCI780: Computer Architecture Modeling and Simulation</b> Instructor Ph.D.-level course, new course	Spring 2023
<b>CSCI780: Data Visualization</b> Instructor Ph.D.-level course, new course	Spring 2022, 2024
<b>CSCI780: Topics in Computer Architecture</b> 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**

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**Ph.D. Students**

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

**Master Researchers**

<b>Daoxuan Xu</b>	University of Florida	2020-current
<b>Yuhui Bao</b>	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

## Selected Media Coverage

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

## Service

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### Ph.D. Dissertation Committee

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

### Master Thesis Committee

<b>Jiangtao Kong</b>	Continued Ph.D. study at W&M	William & Mary	Defended in Spring 2023
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<b>Chair</b> 17th Workshop on General Purpose Processing Using GPU (GPGPU '25)	2025
<b>Artifact Evaluation Chair</b> 2025 IEEE International Symposium on Workload Characterization (IISWC '25)	2025
<b>Program Committee</b> 31th IEEE International Symposium on High-Performance Computer Architecture (HPCA '25)	2025

<b>External Review Committee</b>	2025
2025 IEEE International Symposium on Performance Analysis of Systems and Software (ISPASS '25)	
<b>Chair</b>	2024
2nd Workshop on Computer Architecture Modeling and Simulation (CAMS '24)	
16th Workshop on General Purpose Processing Using GPU (GPGPU '24)	
<b>Program Committee</b>	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)	
<b>External Review Committee</b>	2024
The 51st International Symposium on Computer Architecture (ISCA '24)	
<b>Ad-hoc Reviewer</b>	2024
IEEE 17th Pacific Visualization Symposium (PacificVis '24)	
<b>Journal Reviewer</b>	2024
Transactions on Cloud Computing	
<b>Chair</b>	2023
1st Workshop on Computer Architecture Modeling and Simulation (CAMS '23)	
15th Workshop on General Purpose Processing Using GPU (GPGPU '23)	
<b>Program Committee</b>	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)	
<b>Journal Reviewer</b>	2023
Journal of Parallel and Distributed Computing (JPDC)	
ACM Transactions on Architecture and Code Optimization (TACO)	
<b>Co-Chair</b>	2022
14th Workshop on General Purpose Processing Using GPU (GPGPU '22)	
<b>Workshop/Tutorial Chair</b>	2023
IEEE International Symposium on High-Performance Computer Architecture (HPCA '23)	
<b>Panelist</b>	2022
NSF CISE Office of Advanced Cyberinfrastructure (OAC)	
<b>Program Committee</b>	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)	

<b>Journal Reviewer</b>	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	
<b>Program Committee</b>	2021
IEEE International Symposium on Computer Architecture and High Performance Computing (SBAC-PAD '21)	
40th IEEE International Conference on Computer Design (ICCD '21)	
<b>Journal Reviewer</b>	2021
IEEE Transactions on Parallel and Distributed Systems (TPDS)	
ACM Transactions on Architecture and Code Optimization (TACO)	
IEEE Computer Architecture Letters (CAL) ×2	
<b>Program Committee</b>	2020
39th IEEE International Conference on Computer Design (ICCD '20)	
13th Workshop on General Purpose Processing Using GPU (GPGPU '20)	
<b>Journal Reviewer</b>	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)	
<b>Web Chair</b>	2016
6th Workshop on General Purpose Processing Using GPU (GPGPU '16)	

## Service @ William & Mary

<b>CS Major Advisor</b>	2023-2024
Mengyan He	
Zhuoyan Zheng	
Daniel Seo	
Aibo Li	
<b>Pre-Major Advisor</b>	2024-2025
7 students	
<b>Chair</b>	2024-2025
Computer Science Department Web Presence Committee	
Computer Science Department Graduate Recruiting Committee	
<b>Member</b>	2024-2025
Computer Science Department Colloquium Committee	
<b>Pre-Major Advisor</b>	2023-2024
8 students	
<b>Member of University-Wide Committees</b>	2023-2024
Generative AI University Teaching & Learning Project (UTLP)	

<b>Chair</b> Computer Science Department Web Presence Committee	2023-2024
<b>Member of Committees in the Computer Science Department</b> Colloquium Graduate Recruiting	2023-2024
<b>Member of University-Wide Committees</b> S. Laurie Sanderson Awards for Excellence in Undergraduate Mentoring Committee Research Computing Advisory Committee	2022-2023
<b>CS Major Advisor</b> Srikar G. Vadgantam	2022-2023
<b>Pre-Major Advisor</b> 10 students	2022-2023
<b>Chair</b> Computer Science Department Web Presence Committee	Spring 2023
<b>Co-chair</b> Computer Science Department Web Presence Committee	Fall 2022
<b>Member of Committees in the Data Science Department</b> Faculty Recruitment Committee	2022-2023
<b>Member of Committees in the Computer Science Department</b> Colloquium Committee Graduate Admissions Committee Graduate Recruiting Committee System Committee	2022-2023
<b>Member of Committees in the Computer Science Department</b> Colloquium Committee Graduate Admissions Committee Graduate Recruiting Committee System Committee	2022-2023
<b>CS Major Advisor</b> Ryan Thomas Gainor	2022-2023
<b>Pre-Major Advisor</b> 6 students	2021-2022
<b>Member of University-Wide Committees</b> S. Laurie Sanderson Awards for Excellence in Undergraduate Mentoring Committee	2021-2022
<b>Member of Committees in the Computer Science Department</b> Undergraduate Curriculum Committee Web Presence Committee	2021-2022