Yifan Sun

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Academic Appointments

Assistant Professor — Williamsburg, VA
Computer Science, William & Mary — Aug. 2020 - Present

Education

Northeastern University — Boston, MA
Ph.D. in Computer Engineering — Sep. 2013-Aug. 2020

University at Buffalo — Buffalo, NY
M.S. in Electrical Engineering — Sep. 2011-Jun. 2013

Huazhong University of Science and Technology — Wuhan, China
B.Eng. in Electrical Engineering — Sep. 2007-Jun. 2011

Wuhan University — Wuhan, China
Bachelor in Business Administration (Minor) — Sep. 2008-Jun. 2011

Industry Experience

AMD, Software Engineer (Co-op) — Boxborough, MA
Performance modeling and graphics simulator development for AMD Navi GPUs — Jul. 2018-Dec.2018

Dell EMC, Software Engineer (Co-op) — Hopkinton, MA
Cloud-based GPU-as-a-service system design, development, and deployment — Jul. 2016-Dec.2016

Awards

2024	**CAREER Award**, NSF	William & Mary, VA
2023	**Best Paper Award**, CHI'23	Hamburg, Germany
2020	**Best Paper Honorable Mention**, CHI'20	Honolulu, HI
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

I have acquired research funding that totals $1,685,843 at William & Mary.

Advancing Tools and Resources for the AMD ROCm Platform — $100,000
AMD, Gift, Sole PI — Dec. 2024

CAREER: Towards Next-Generation Human-in-the-Loop and Human-over-the-Loop Computer Architecture Performance Analysis Infrastructure — $598,555
NSF, CAREER, Sole PI — 4/1/2025-3/31/2030

Enabling GPU Performance Simulation for Large-Scale Workloads with Lightweight Simulation Methods — $1,133,743; my share=$376,249
NSF, SHF Core, Medium — 5/1/2024-4/30/2028
PI: Yifan Sun (lead institution lead PI), Adwait Jog, Sreepathi Pai

Binary Instrumentation for GPU Programs on AMD Platforms. — $50,000
AMD, Gift, Sole PI — Dec. 2023

HIP Development on AMD ROCm Platform. — $50,000
AMD, Gift, Sole PI — Dec. 2023

The Methods of Profiling and Tracing of GPU Programs Running on AMD ROCm Platforms. — $44,000
AMD, Gift, Sole PI — May. 2023

Building Explainable Architecture with Simulation and Visualization Techniques — $175,000
NSF, CRII, Sole PI — 5/1/2023-4/30/2026

Enabling Computer Architecture as a Service — $100,000; my share=$72,369
NSF, CCRI (later renamed as CIRC), Planning-C — 3/15/2023-2/28/2026
PI: Yifan Sun (lead institution lead PI), Katherine E. Issacs (University of Utah)

AMD ROCm and HIP Platform Development — $60,000 + 2x AMD MI100 GPU
AMD, Gift, Sole PI — Mar. 2022

Exploring Interpretable Deep Learning from Information Theoretic Perspective: Modeling and Applications — Access to Cerebras Wafer-Scale Computing Devices
Neocortex, Pittsburgh Supercomputing Center — Feb. 2022
PI: Huajie Shao, Yifan Sun

Developing Infrastructure for Advancing Research and Teaching in Security and Reliability — $79,670 for equipment shared by the department
Coastal Virginia Center for Cyber Innovation (COVA CCI) — Dec. 2021
PI: Dmitry Evtyushkin, Co-PI: Evgenia Smirni, Yifan Sun, Adwait Nadkarni

AMD ROCm and HIP Platform Development — $40,000
AMD, Gift, Sole PI — Sep. 2021

General-Purpose Computing with AMD Graphics Processors — $40,000
AMD, Gift, Sole PI — Apr. 2021

Publications

Underline—Myself

Wavy Underline—My W&M Student Advisee

Peer-Reviewed Conference Papers

32. Wenhan Lyu, Yimeng Wang, Yifan Sun, and Yixuan Zhang. 2025. **Will Your Next Pair Programming Partner Be Human? An Empirical Evaluation of Generative AI as a Collaborative Teammate in a Semester-Long Classroom Setting**. In Proceedings of the Twelfth ACM Conference on Learning @ Scale (L@S '25). Association for Computing Machinery, New York, NY, USA, 83–94. https://doi.org/10.1145/3698205.3729544 [Acceptance Rate 18/84 ≈ 21.4%]

31. Ying Li, Yuhui Bao, Gongyu Wang, Xinxin Mei, Pranav Vaid, Anandaroop Ghosh, Adwait Jog, Darius Bunandar, Ajay Joshi, and Yifan Sun. 2025. **TrioSim: A Lightweight Simulator for Large-Scale DNN Workloads on Multi-GPU Sys-**

tems. In Proceedings of the 52nd Annual International Symposium on Computer Architecture (ISCA '25). Association for Computing Machinery, New York, NY, USA, 1524–1538. https://doi.org/10.1145/3695053.3731082 [Acceptance Rate 132/570 ≈ 23.2%]

30. Amel Fatima, Yang Yang, Yifan Sun, Rachata Ausavarungnirun, and Adwait Jog. 2025. **NetCrafter: Tailoring Network Traffic for Non-Uniform Bandwidth Multi-GPU Systems**. In Proceedings of the 52nd Annual International Symposium on Computer Architecture (ISCA '25). Association for Computing Machinery, New York, NY, USA, 1064–1078. https://doi.org/10.1145/3695053.3731040 [Acceptance Rate 132/570 ≈ 23.2%]

29. Changxi Liu, Miao Yu, Yifan Sun, and Trevor E. Carlson. 2025. **The Sparsity-Aware LazyGPU Architecture**. In Proceedings of the 52nd Annual International Symposium on Computer Architecture (ISCA '25). Association for Computing Machinery, New York, NY, USA, 1020–1034. https://doi.org/10.1145/3695053.3731009 [Acceptance Rate 132/570 ≈ 23.2%]

28. Matin Raayai-Ardakani, Andrew Nguyen, Ivan Rosales, Daoxuan Xu, Yuwei Sun, Yifan Sun, David Kaeli, and Norman Rubin. 2025. **Luthier: A Dynamic Binary Instrumentation Framework Targeting AMD GPUs**. In Proceedings of the 2025 IEEE International Symposium on Performance Analysis of Systems and Software (ISPASS), May 11-13, 2025. 137–149. Ghent, Belgium. https://doi.org/10.1109/ISPASS64960.2025.00022 [Acceptance Rate 28/99 ≈ 28%]

27. Ali Mosallaei, Katherine E. Isaacs, and Yifan Sun. 2024. **Looking into the Black Box: Monitoring Computer Architecture Simulations in Real-Time with AkitaRTM**. In 2024 57th IEEE/ACM International Symposium on Microarchitecture (MICRO '24). IEEE, 780–794. https://doi.org/10.1109/MICRO61859.2024.00063 [Acceptance Rate 113/ 489 ≈ 22.7%]

26. Wenhan Lyu, Yimeng Wang, Tingting (Rachel) Chung, Yifan Sun, and 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). Association for Computing Machinery, New York, NY, USA, 63–74. https://doi.org/10.1145/3657604.3662036 [Acceptance rate: 22/ 90 ≈ 24.4%]

25. Yichen Luo, Daoxuan Xu, Gang Zhou, Yifan Sun, and Sidi Lu. 2024. **Impact of Raindrops on Camera-Based Detection in Software-Defined Vehicles**. In 2024 IEEE International Conference on Mobility, Operations, Services and Technologies (MOST '24). IEEE, 193–205. https://doi.org/10.1109/MOST60774.2024.00028

24. Ying Li, Yifan Sun, and Adwait Jog. 2023. **Path Forward Beyond Simulators: Fast and Accurate GPU Execution Time Prediction for DNN Workloads**. In Proceedings of the 56th Annual IEEE/ACM International Symposium on Microarchitecture (MICRO '23). Association for Computing Machinery, New York, NY, USA, 380–394. https://doi.org/10.1145/3613424.3614277 [Acceptance rate: 101/424 ≈ 23.8%]

23. Changxi Liu, Yifan Sun, and Trevor E. Carlson. 2023. **Photon: A Fine-grained Sampled Simulation Methodology for GPU Workloads**. In Proceedings of the 56th Annual IEEE/ACM International Symposium on Microarchitecture (MICRO '23). Association for Computing Machinery, New York, NY, USA, 1227–1241. https://doi.org/10.1145/3613424.3623773 [Acceptance rate: 101/424 ≈ 23.8%]

22. 🏆 **[Best Paper Award (Top 1%)]** Yixuan Zhang, Joseph D Gaggiano, Nutchanon Yongsatianchot, Nurul M 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 Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems (CHI '23). Association for Computing Machinery, New York, NY, USA, Article 670, 1–22. https://doi.org/10.1145/3544548.3581019 [Acceptance rate: 879/3182 ≈ 27.6%]

21. Yixuan Zhang, Yifan Sun, Joseph D. Gaggiano, Neha Kumar, Clio Andris, and Andrea G. Parker. 2023. **Visualization Design Practices in a Crisis: Behind the Scenes with COVID-19 Dashboard Creators**. IEEE Transactions on Visualization and Computer Graphics 29, 1 (2023), 1037–1047. https://doi.org/10.1109/TVCG.2022.3209493. [Acceptance rate: 122/460 ≈ 26.5%]

20. Yuhui Bao, Yifan Sun, Zlatan Feric, Michael Tian Shen, Micah Weston, José L. Abellán, Trinayan Baruah, John Kim, Ajay Joshi, and David Kaeli. 2023. **NaviSim: A Highly Accurate GPU Simulator for AMD RDNA GPUs**. In Proceedings of the International Conference on Parallel Architectures and Compilation Techniques (PACT '22). Association for Comput-

ing Machinery, New York, NY, USA, 333–345. https://doi.org/10.1145/3559009.3569666 [Acceptance rate: 50/ 118 ≈ 42.4%]

19. 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 Proceedings of the 2022 CHI Conference on Human Factors in Computing Systems (CHI '22). Association for Computing Machinery, New York, NY, USA, Article 78, 1–21. https://doi.org/10.1145/3491102.3501889 [Top 12.5%; Acceptance rate: 638/ 2597 ≈ 24.6%]

18. Yifan Sun, Yixuan Zhang, Ali Mosallaei, Michael D. Shah, Cody Dunne, and David Kaeli. 2021. **Daisen: A Framework for Visualizing Detailed GPU Execution**. Computer Graphics Forum 40, 3 (2021), 239–250. https://doi.org/10.1111/cgf.14303 [Acceptance Rate ≈ 26.0%]

17. Yixuan Zhang, Yifan Sun, Lace Padilla, Sumit Barua, Enrico Bertini, and Andrea G Parker. 2021. **Mapping the Landscape of COVID-19 Crisis Visualizations**. In Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems (CHI '21). Association for Computing Machinery, New York, NY, USA, Article 608, 1–23. https://doi.org/10.1145/3411764.3445381 [Acceptance rate ≈ 26.3%]

16. Trinayan Baruah, Kaustubh Shivdikar, Shi Dong, Yifan Sun, Saiful A. Mojumder, Kihoon Jung, José L. Abellán, Yash Ukidave, Ajay Joshi, John Kim, and David Kaeli. 2021. **GNNMark: A Benchmark Suite to Characterize Graph Neural Network Training on GPUs**. In 2021 IEEE International Symposium on Performance Analysis of Systems and Software (ISPASS '21). IEEE, 13–23. https://doi.org/10.1109/ISPASS51385.2021.00013 [Acceptance rate ≈ 36.9%]

15. Trinayan Baruah, Yifan Sun, Saiful A. Mojumder, José L. Abellán, Yash Ukidave, Ajay Joshi, Norman Rubin, John Kim, and David Kaeli. 2020. **Valkyrie: Leveraging Inter-TLB Locality to Enhance GPU Performance**. In Proceedings of the ACM International Conference on Parallel Architectures and Compilation Techniques (PACT '20). Association for Computing Machinery, New York, NY, USA, 455–466. https://doi.org/10.1145/3410463.3414639 [Acceptance rate ≈ 25.9%]

14. 🏆 **[Best Paper Honorable Mention (<5%)]** Omid Mohaddesi, Yifan Sun, Rana Azghandi, Rozhin Doroudi, Sam Snodgrass, Ozlem Ergun, Jacqueline Griffin, David Kaeli, Stacy Marsella, and Casper Harteveld. 2020. **Introducing Gamettes: A Playful Approach for Capturing Decision-Making for Informing Behavioral Models**. In Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems (CHI '20). Association for Computing Machinery, New York, NY, USA, 1–13. https://doi.org/10.1145/3313831.3376571 [Acceptance rate ≈ 24.3%]

13. Trinayan Baruah, Yifan Sun, Ali Tolga Dinçer, Saiful A. Mojumder, José L. Abellán, Yash Ukidave, Ajay Joshi, Norman Rubin, John Kim, and David Kaeli. 2020. **Griffin: Hardware-Software Support for Efficient Page Migration in Multi-GPU Systems**. In 2020 IEEE International Symposium on High Performance Computer Architecture (HPCA '20). IEEE, 596–609. https://doi.org/10.1109/HPCA47549.2020.00055 [Acceptance rate ≈ 19.4%]

12. Yifan Sun, Trinayan Baruah, Saiful A. Mojumder, Shi Dong, Xiang Gong, Shane Treadway, Yuhui Bao, Spencer Hance, Carter McCardwell, Vincent Zhao, Harrison Barclay, Amir Kavyan 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). Association for Computing Machinery, New York, NY, USA, 197–209. https://doi.org/10.1145/3307650.3322230 [Acceptance rate ≈ 17.0%]

11. 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 2019 IEEE International Parallel and Distributed Processing Symposium (IPDPS '19). IEEE, 664–674. https://doi.org/10.1109/IPDPS.2019.00075 [Acceptance rate ≈ 27.7%]

10. Saiful A. Mojumder, Marcia S. Louis, Yifan Sun, Amir Kavyan Ziabari, José L. Abellán, John Kim, David Kaeli, and Ajay Joshi. 2018. **Profiling DNN Workloads on a Volta-based DGX-1 System**. In 2018 IEEE International Symposium on Workload Characterization (IISWC '18). IEEE, 122–133. https://doi.org/10.1109/IISWC.2018.8573521 [Acceptance rate ≈ 36.2%]

9. Rozhin Doroudi, Rana Azghandi, Zlatan Feric, Omid Mohaddesi, Yifan Sun, Jacqueline Griffin, Ozlem Ergun, David Kaeli, Pedro Sequeira, Stacy Marsella, and Casper Harteveld. 2018. **An Integrated Simulation Framework for Examining Resiliency in Pharmaceutical Supply Chains Considering Human Behaviors**. In 2018 Winter Simulation Conference (WSC '18). IEEE, 88–99. https://doi.org/10.1109/WSC.2018.8632387 [Acceptance rate ≈ 70.4%]

8. 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 2018 IEEE International Symposium on Performance Analysis of Systems and Software (ISPASS '18). IEEE, 209–218. https://doi.org/10.1109/ISPASS.2018.00034 [Acceptance rate ≈ 31.3%]

7. 🏆 [**Best Paper Award**] Shi Dong, Xiang Gong, Yifan Sun, Trinayan Baruah, and David Kaeli. 2018. **Characterizing the Microarchitectural Implications of a Convolutional Neural Network (CNN) Execution on GPUs**. In Proceedings of the 2018 ACM/SPEC International Conference on Performance Engineering (ICPE '18). Association for Computing Machinery, New York, NY, USA, 96–106. https://doi.org/10.1145/3184407.3184423 [Acceptance rate = 24.0%]

6. Trinayan Baruah, Yifan Sun, Shi Dong, David Kaeli, and Norm Rubin. 2018. **Airavat: Improving Energy Efficiency of Heterogeneous Applications**. In 2018 Design, Automation & Test in Europe Conference & Exhibition (DATE '18). IEEE, 731–736. DOI: https://doi.org/10.23919/DATE.2018.8342104 [Acceptance rate ≈ 24.2%]

5. 🏆 [**Best Paper Candidate**] Yifan Sun, Xiang Gong, Amir Kavyan 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 2016 IEEE International Symposium on Workload Characterization (IISWC '16). IEEE, 1–10. https://doi.org/10.1109/IISWC.2016.7581262[Acceptance rate ≈ 30.4%]

4. Yifan Sun, Chisheng Liang, Steven Sutherland, Casper Harteveld, and David Kaeli. 2016. **Modeling Player Decisions in a Supply Chain Game**. In 2016 IEEE Conference on Computational Intelligence and Games (CIG '16). IEEE, 1–8. https://doi.org/10.1109/CIG.2016.7860444 [Acceptance rate unknown]

3. Saoni Mukherjee, Yifan Sun, Paul Blinzer, Amir Kavyan Ziabari, and David Kaeli. 2016. **A Comprehensive Performance Analysis of HSA and OpenCL 2.0**. In 2016 IEEE International Symposium on Performance Analysis of Systems and Software (ISPASS '16). IEEE, 183–193. https://doi.org/10.1109/ISPASS.2016.7482093 [Acceptance rate ≈ 35.1%]

2. Jithin Jagannath, Anu Saji, Hovannes Kulhandjian, Yifan Sun, Emrecan 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 International Conference on Underwater Networks & Systems (WUWNet '13). Association for Computing Machinery, New York, NY, USA, Article 3, 1–8. https://doi.org/10.1145/2532378.2532382 [Acceptance rate = 20.0%]

1. 🏆 Yifan Sun and Tommaso Melodia. 2013. **The Internet Underwater: an IP-compatible protocol stack for commercial undersea modems**. In Proceedings of the 8th International Conference on Underwater Networks &; Systems (WUWNet '13). Association for Computing Machinery, New York, NY, USA, Article 37, 1–8. https://doi.org/10.1145/2532378.2532407 [Acceptance rate = 20.0%]

Journals

8. Wenhan Lyu, Shuang Zhang, Tingting Chung, Yifan Sun, and 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 8 (2025), 100383. https://doi.org/10.1016/j.caeai.2025.100383

7. Shaoyu Wang, Hang Yan, Katherine E. Isaacs, and Yifan Sun. 2024. **Visual Exploratory Analysis for Designing Large-Scale Network-on-Chip Architectures: A Domain Expert-Led Design Study**. IEEE Transactions on Visualization and Computer Graphics 30, 4 (2024), 1970–1983. https://doi.org/10.1109/TVCG.2023.3337173

6. Shi Dong, Yifan Sun, Nicolas Bohm Agostini, Elmira Karimi, Daniel Lowell, Jing Zhou, José Cano, José L. Abellán, and David Kaeli. 2021. **Spartan: A Sparsity-Adaptive Framework to Accelerate Deep Neural Network Training on GPUs**.

IEEE Transactions on Parallel and Distributed Systems 32, 10 (2021), 2448–2463. https://doi.org/10.1109/TPDS.2021.3067825

5. Rozhin Doroudi, Pedro Sequeira, Stacy Marsella, Ozlem Ergun, Rana Azghandi, David Kaeli, Yifan Sun, and Jacqueline Griffin. 2020. **Effects of trust-based decision making in disrupted supply chains**. PLOS ONE 15, 2 (February 2020), e0224761. https://doi.org/10.1371/journal.pone.0224761

4. 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 Systems**. IEEE Computer Architecture Letters 18, 2 (2019), 157–160. https://doi.org/10.1109/LCA.2019.2955119

3. Amir Kavyan 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 Trans. Archit. Code Optim. 13, 4, Article 35 (December 2016), 25 pages. https://doi.org/10.1145/2996190

2. 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 (2015), 263–272. https://doi.org/10.1109/TVT.2014.2318837

1. Yifan Sun and Kaushik R. Chowdhury. 2014. **Enabling Emergency Communication Through a Cognitive Radio Vehicular Network.** IEEE Communications Magazine 52, 10 (2014), 68–75. https://doi.org/10.1109/MCOM.2014.6917404

Books

2. Yifan Sun, Sabila Al Jannat, Trinayan Buruah, and David Kaeli. 2025. **Accelerated Computing with HIP: Second Edition.** ISBN:979-8218107444.

1. Yifan Sun, Trinayan Buruah, and David Kaeli. 2022. **Accelerated Computing with HIP**. ISBN:979-8218107444.

Translation of My Books

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.

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

4. 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.

3. 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.

2. 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.

1. 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

8. 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).

7. 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).

6. 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).

5. 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).

4. 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).

3. 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).

2. 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).

1. 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).

Preprints

4. 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.

3. 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.

2. 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.

1. 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

7. **The CHIP Dataset** https://chip-dataset.vercel.app
   A dataset with 2185 CPUs and 2668 GPUs.
   Help researchers understand the semiconductor development trends.

6. **Daisen (now part of Akita)**
   A general-purpose visualization tool that reveals the detailed behavior of hardware components.

5. **MGPUSim** https://github.com/sarchlab/mgpusim
   A multi-GPU system simulator based on AMD GCN3 GPUs.

4. **Akita** https://github.com/sarchlab/akita
   A high-flexibility, high-performance, parallel computer architecture simulation framework.

3. **Hetero-Mark** https://github.com/NUCAR-DEV/Hetero-Mark
   A benchmark suite for CPU-GPU collaborative computing.

2. **Drug Supply Chain Simulator** https://gitlab.com/syifan/crisp
   A human-in-the-loop logistics simulator for the U.S. drug supply chain.

1. **VistaLights** https://github.com/syifan/VistaLights
   Strategic game for maritime traffic management and disaster relief.

Talks and Tutorials

14. **User-Friendly Tools in Akita 3.0**
    The 2nd Workshop on Computer Architecture Modeling and Simulation (CAMS '24). November 2024.

13. **On the Human Side of Computer Architecture, Towards Explainable Architecture**
    North Carolina State University. October 2024.

12. **Towards Building Explainable Computer Architecture**
    Lehigh University. Feb 2023.

11. **MGPUSim: A One-Stop Solution for GPU Architecture Simulation**
    The 2020 International Conference on High Performance Computing & Simulation (HPCS '20). Jan 2021.

10. **MGPUSim: A High-Flexibility, High-Performance, Multi-GPU Simulator**
    Alibaba. July 2020.

9. **Exploring Multi-GPU Simulation and Visual Profiling with MGPUSim**
   With José L. Abellán, Trinayan Baruah, and David Kaeli. Tutorial at ISCA 2020. May 2020.

8. **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.

7. **Tutorial on the Akita Simulator Framework and MGPUSim**
   With Trinayan Baruah, Shi Dong, and David Kaeli. Tutorial at HPCA 2020. February 2020.

6. **Research in the NUCAR Laboratory at Northeastern University**
   FutureWei. With David Kaeli. July 2019.

5. **MGSim: a Flexible High-Performance Simulator for Multi-GPU Systems**
   International Workshop on OpenCL (IWOCL). May 2019.

4. **AKITA: A Go-Based Computer Architecture Simulator Framework**
   Google. May 2019.

3. **Enabling Multi-GPU High Performance Computing with Memory System Design**
   Lighting talk at Boston University Red Hat Collaboratory. February 2019.

2. **Benchmarking the New Unified Memory of CUDA 8**
   With Frank Zhao. GTC 2017 San Jose. August 2017.

1. **Multi2Sim 5.0**
   Tutorial at IISWC 2016. September 2016.

Teaching

Teaching @ William & Mary

CSCI654: **Advanced Computer Architecture** Spring 2025
Instructor
Graduate level, new course

CSCI432: **Web Programming** Fall 2024, 2025
Instructor
Senior undergrad-level course, new course

CSCI780: **Computer Architecture Modeling and Simulation** Spring 2023
Instructor
Ph.D.-level course, new course

CSCI780: **Data Visualization** Spring 2022, 2024
Instructor
Ph.D.-level course, new course

CSCI780: **Topics in Computer Architecture** Spring 2021
Instructor
Ph.D.-level course, new course

CSCI141: **Computational Problem Solving** Fall 2020-2023
Instructor
Undergraduate's first Python programming course (1st - 2nd year)

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	Co-advised with Jie Ren	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	2022-2023
Yuhui Bao	Northeastern University	2018-2020

Undergraduate Researchers

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

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 2025
William & Mary professor wins NSF CAREER award to study computer chip performance; Sun brings human-centered approach to computer architecture

William & Mary News 2023
Books published by William & Mary faculty in 2023

FiveThirtyEight 2022
The Datasets We're Looking At This Week (The CHIP dataset is highlighted by the "Data Is Plural" column at FiveThirtyEight)

William & Mary News 2022
Misinformation examination: How trust and distrust shift during COVID-19

WYDaily 2021
W&M Professor Helps Medical Experts Study COVID-19 With GPUs

William & Mary News 2021
Sun is Teaching COVID-19 Researchers How to Use High-Performance AMD Computers

HiPEAC info 58 2019
MGPUSim announced at ISCA 2019

News@Northeastern College of Engineering 2019
Yifan Sun and NUCAR Research Lab featured in HiPEAC News

News@Northeastern 2018
A Student Went off to Do a Co-op at a Major Tech Firm. He Came Back With a Patent.

WIRED 2013
Finally, the Underwater We've All Been Waiting For

NBC News 2013
Deep-sea Internet to Detect Tsunamis, Spy on Smugglers, and Discover Oil

Service

Ph.D. Dissertation Committee

Lishan Yang	Joined GMU as Assitant 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

Professional Organization Participation

Member 2025-
Technical Community on Microprogramming and Microarchitecture (TCuARCH)

Conference Organization

Local Organization Chair William & Mary, 2025
The 17th NASA Formal Methods Symposium (NFM '25)

Artifact Evaluation Chair 2025
2025 IEEE International Symposium on Workload Characterization (IISWC '25)

Workshop/Tutorial Chair 2023
IEEE International Symposium on High-Performance Computer Architecture (HPCA '23)

Workshop Chairing

Chair 17th Workshop on General Purpose Processing Using GPU (GPGPU '25) 2025
Chair 2nd Workshop on Computer Architecture Modeling and Simulation (CAMS '24) 2024
Chair 16th Workshop on General Purpose Processing Using GPU (GPGPU '24) 2024
Chair 1st Workshop on Computer Architecture Modeling and Simulation (CAMS '23) 2023
Chair 15th Workshop on General Purpose Processing Using GPU (GPGPU '23) 2023
Chair 14th Workshop on General Purpose Processing Using GPU (GPGPU '22) 2022
Web Chair 6th Workshop on General Purpose Processing Using GPU (GPGPU '16) 2016

Funding Agency Panelist

DOE Panelist 2025
The Office of Advanced Scientific Computing Research (ASCR), Early Career Research Program (ECRP)

NSF Panelist 2022
NSF Cyberinfrastructure for Sustained Scientific Innovation (CSSI), Element

Program Committee

HPCA '25 31st IEEE International Symposium on High-Performance Computer Architecture 2025
CF '24 21st ACM International Conference on Computing Frontiers 2024

HPCA '24 30th IEEE International Symposium on High-Performance Computer Architecture	2024
AccML '24 6th Workshop on Accelerated Machine Learning	2024
ICCD '24 42nd IEEE International Conference on Computer Design	2024
ICCD '23 41st IEEE International Conference on Computer Design	2023
CF '23 20th ACM International Conference on Computing Frontiers	2023
AccML '23 5th Workshop on Accelerated Machine Learning	2023
HPCA '23 IEEE International Symposium on High-Performance Computer Architecture	2023
SBAC-PAD '22 International Symposium on Computer Architecture and High Performance Computing	2022
ICCD '22 40th IEEE International Conference on Computer Design	2022
AccML '22 4th Workshop on Accelerated Machine Learning	2022
SBAC-PAD '21 IEEE International Symposium on Computer Architecture and High Performance Computing	2021
ICCD '21 40th IEEE International Conference on Computer Design	2021
ICCD '20 39th IEEE International Conference on Computer Design	2020
GPGPU '20 13th Workshop on General Purpose Processing Using GPU	2020

Journal Reviewer

TACO ACM Transactions on Architecture and Code Optimization (2 reviews)	2025
TCC Transactions on Cloud Computing	2024
JPDC Journal of Parallel and Distributed Computing	2023
TACO ACM Transactions on Architecture and Code Optimization	2023
TOMPECS ACM Transactions on Modeling and Performance Evaluation of Computing Systems	2022
TACO ACM Transactions on Architecture and Code Optimization	2022
FGCS Future Generation Computer Systems	2022
TPDS IEEE Transactions on Parallel and Distributed Systems	2022
IEEE Micro IEEE Micro	2022
TPDS IEEE Transactions on Parallel and Distributed Systems	2021
TACO ACM Transactions on Architecture and Code Optimization	2021
CAL IEEE Computer Architecture Letters (2 reviews)	2021
JPDC Journal of Parallel and Distributed Computing	2020
TPDS IEEE Transactions on Parallel and Distributed Systems	2020
TOC IEEE Transactions on Computers	2020
TACO ACM Transactions on Architecture and Code Optimization	2020

External Review Committee or Ad-hoc Reviewer

ISPASS '25 IEEE International Symposium on Performance Analysis of Systems and Software	2025
ISCA '24 International Symposium on Computer Architecture (External Review Committee)	2024
PacificVis '24 IEEE Pacific Visualization Symposium (Ad-hoc Reviewer)	2024

William & Mary Undergraduate Advising

Pre-Major Advisor 7 students	2025-2026
Pre-Major Advisor 7 students	2024-2025
CS Major Advisor 4 students	2023-2024
Prem-Major Advisor 8 students	2023-2024
CS Major Advisor 1 student	2022-2023
Pre-Major Advisor 10 students	2022-2023
CS Major Advisor 1 student	2022-2023
Pre-Major Advisor 6 students	2021-2022

William & Mary University-Wide Committee

Member Generative AI University Teaching & Learning Project (UTLP)	2023-2024
Member S. Laurie Sanderson Awards for Excellence in Undergraduate Mentoring Committee	2022-2023
Member Research Computing Advisory Committee	2022-2023
Member S. Laurie Sanderson Awards for Excellence in Undergraduate Mentoring Committee	2021-2022

William & Mary Department-Level Committee

Member Computer Science Undergraduate Curriculum	2025-2026
Member Computer Science Web Presence	2025-2026
Chair Computer Science Graduate Recruiting	2024-2025
Member Computer Science Web Presence	2024-2025
Member Computer Science Colloquium	2024-2025
Member Computer Science Graduate Recruiting	2023-2024
Member Computer Science Web Presence	2023-2024
Member Computer Science Colloquium	2023-2024
Chair Computer Science Web Presence	2022-2023
Member Data Science Faculty Recruitment	2022-2023
Member Computer Science Colloquium	2022-2023
Chair Computer Science Fraduate Admission	2022-2023
Member Computer Science Graduate Recruiting	2022-2023
Member Computer Science System	2022-2023
Member Computer Science Web Presence	2021-2022
Member Computer Science Curriculum	2021-2022