

# Wenwen Wang

Assistant Professor  
School of Computing  
University of Georgia

415 Boyd Graduate Studies Research Center  
Athens, GA 30602-7404  
☎ +1 (706) 542-2911  
✉ wenwen@cs.uga.edu  
🏠 <http://cobweb.cs.uga.edu/~wenwen>

## RESEARCH INTERESTS

- System virtualization, runtime systems, just-in-time (JIT) compilation, and dynamic optimizations
- System/software security, program analysis for software vulnerability detection, and hardware TEEs
- Parallel programming, concurrency bug detection and localization, performance profiling and analysis

## RESEARCH EXPERIENCES

Assistant Professor	University of Georgia	09/2019 – Present
Postdoc Associate	University of Minnesota, Twin Cities	09/2015 – 07/2019
Research Scholar	University of Colorado, Colorado Springs	09/2014 – 08/2015
Research Assistant	University of Chinese Academy of Sciences	09/2007 – 07/2014

## EDUCATION

Ph.D.	University of Chinese Academy of Sciences	09/2007 – 07/2014
B.Eng.	Beijing University of Posts and Telecommunications	09/2003 – 07/2007

## PUBLICATIONS

### *Conference*

1. Jiameng Shi, Wenqiang Li, **Wenwen Wang**, and Le Guan, Facilitating Non-Intrusive In-Vivo Firmware Testing with Stateless Instrumentation, In *the Proceedings of the 32<sup>nd</sup> Network and Distributed System Security Symposium (NDSS '24)*, San Diego, California, February 2024.
2. Jinhu Jiang, Zhongjun Zhou, Chaoyi Liang, Rongchao Dong, Zhaohui Yang, **Wenwen Wang**, Peng-Chung Yew, and Weihua Zhang, In *Proceedings of the 22<sup>nd</sup> IEEE/ACM International Symposium on Code Generation and Optimization (CGO '24)*, Edinburgh, UK, March 2024.
3. **Wenwen Wang**, How Far We've Come – A Characterization Study of Standalone WebAssembly Runtimes, In *Proceedings of the 25<sup>th</sup> IEEE International Symposium on Workload Characterization (IISWC '22)*, Austin, TX, USA, November 2022.
4. **Wenwen Wang**, MPIRace: A Static Data Race Detector for MPI Programs, In *Proceedings of the 35<sup>th</sup> International Workshop on Languages and Compilers for Parallel Computing (LCPC '22)*, Chicago, Illinois, USA, October 2022.
5. Jin Wu, Jian Dong, Ruili Fang, Wen Zhang, **Wenwen Wang**, Decheng Zuo, FADATest: Fast and Adaptive Performance Regression Testing of Dynamic Binary Translation Systems, In *Proceedings of the 44<sup>th</sup> International Conference on Software Engineering (ICSE '22)*, Pittsburgh, PA, USA, May 2022.
6. Jin Wu, Jian Dong, Ruili Fang, Wen Zhang, **Wenwen Wang**, Decheng Zuo, WDBT: Wear Characterization, Reduction, and Leveling of DBT Systems for Non-Volatile Memory, In *Proceedings of the International Symposium on Memory Systems (MEMSYS '21)*, Virtual, 2021.

7. Ruiqi Tang, Ziyi Zhao, Kailun Wang, Xiaoli Gong, Jin Zhang, **Wenwen Wang**, and Pen-Chung Yew, Ascetic: Enhancing Cross-Iterations Data Efficiency in Out-of-Memory Graph Processing on GPUs, In *Proceedings of the 50<sup>th</sup> International Conference on Parallel Processing (ICPP '21)*, Virtual, August 2021.
8. **Wenwen Wang**, MLEE: Effective Detection of Memory Leaks on Early-Exit Paths in OS Kernels, In *Proceedings of the Annual Conference on USENIX Annual Technical Conference (USENIX ATC '21)*, Virtual, July 2021.
9. Hengyi Li, Zhichen Wang, Xuebin Yue, **Wenwen Wang**, Tomiyama Hiroyuki, and Lin Meng, A Comprehensive Analysis of Low-Impact Computations in Deep Learning Workloads, In *Proceedings of the 31<sup>st</sup> ACM Great Lakes Symposium on VLSI (GLSVLSI '21)*, Virtual, June 2021.
10. **Wenwen Wang** and Pei-Hung Lin, Does It Matter? – OMPSanitizer: An Impact Analyzer of Reported Data Races in OpenMP Programs, In *Proceedings of the 35<sup>th</sup> ACM International Conference on Supercomputing (ICS '21)*, Virtual, June 2021.
11. Jin Wu, Jian Dong, Ruili Fang, Ziyi Zhao, Xiaoli Gong, **Wenwen Wang**, and Decheng Zuo, Effective Exploitation of SIMD Resources in Cross-ISA Virtualization, In *Proceedings of the 17<sup>th</sup> ACM SIGPLAN/SIGOPS International Conference on Virtual Execution Environments (VEE '21)*, Virtual, April 2021.
12. **Wenwen Wang**, Helper Function Inlining in Dynamic Binary Translation, In *Proceedings of the 30<sup>th</sup> ACM SIGPLAN International Conference on Compiler Construction (CC '21)*, Virtual, March 2021.
13. Ziyi Zhao, Zhang Jiang, Ying Chen, Xiaoli Gong, **Wenwen Wang**, and Pen-Chung Yew, Enhancing Atomic Instruction Emulation for Cross-ISA Dynamic Binary Translation, In *Proceedings of the 19<sup>th</sup> Annual IEEE/ACM International Symposium on Code Generation and Optimization (CGO '21)*, Virtual, March 2021.
14. Ximing Liu, **Wenwen Wang**, Lizhi Wang, Xiaoli Gong, Ziyi Zhao, Pen-Chung Yew, Regaining Lost Seconds: Efficient Page Preloading for SGX Enclaves, In *Proceedings of the ACM/IFIP Middleware Conference 2020 (Middleware '20)*, Delft, Netherlands, December 2020.
15. Jin Wu, Jian Dong, Ruili Fang, **Wenwen Wang**, Decheng Zuo, PerfDBT: Efficient Performance Regression Testing of Dynamic Binary Translation, In *Proceedings of the 38<sup>th</sup> IEEE International Conference on Computer Design (ICCD '20)*, Hartford, Connecticut, USA, October 2020.
16. Jinhu Jiang, Rongchao Dong, Zhongjun Zhou, Changheng Song, **Wenwen Wang**, Pen-Chung Yew, Weihua Zhang, More with Less – Deriving More Translation Rules with Less Training Data for DBTs Using Parameterization, In *Proceedings of the 53<sup>rd</sup> IEEE/ACM International Symposium on Microarchitecture (MICRO '20)*, Athens, Greece, October 2020.
17. Ziyi Zhao, Zhang Jiang, Ximing Liu, Xiaoli Gong, **Wenwen Wang**, and Pen-Chung Yew, DQEMU: A Scalable Emulator with Retargetable DBT on Distributed Platforms, In *Proceedings of the 49<sup>th</sup> International Conference on Parallel Processing (ICPP '20)*, Edmonton, AB, Canada, August 2020.
18. **Wenwen Wang**, Pen-Chung Yew, Antonia Zhai, and Stephen McCamant, Efficient and Scalable Cross-ISA Virtualization of Hardware Transactional Memory. In *Proceedings of the 18<sup>th</sup> Annual IEEE/ACM International Symposium on Code Generation and Optimization (CGO '20)*, San Diego, CA, February 2020. (acceptance rate: 27%, 25/92)
19. Jian Sun, Dingyuan Cao, Ximing Liu, Ziyi Zhao, Xiaoli Gong, **Wenwen Wang**, and Jin Zhang, SEL-Wasm: A Code Protection Mechanism for WebAssembly. In *Proceedings of the 17<sup>th</sup> IEEE International*

*Symposium on Parallel and Distributed Processing with Applications (ISPA '19)*, Xiamen, China, December 2019.

20. Changheng Song, **Wenwen Wang**, Pen-Chung Yew, Antonia Zhai, and Weihua Zhang, Unleashing the Power of Learning: An Enhanced Learning-based Approach for Dynamic Binary Translation. In *Proceedings of the Annual Conference on USENIX Annual Technical Conference (USENIX ATC '19)*, Renton, WA, July 2019. (acceptance rate: 20%; 71/352)
21. **Wenwen Wang**, Kangjie Lu, and Pen-Chung Yew, Check It Again: Detecting Lacking-Recheck Bugs in OS Kernels. In *Proceedings of the 25<sup>th</sup> ACM Conference on Computer and Communications Security (CCS '18)*, Toronto, Canada, October 2018. (acceptance rate: 17.4%; 134/771)
22. **Wenwen Wang**, Jiacheng Wu, Xiaoli Gong, Tao Li, and Pen-Chung Yew. Improving Dynamically-Generated Code Performance on Dynamic Binary Translators. In *Proceedings of the 14<sup>th</sup> ACM SIGPLAN/SIGOPS International Conference on Virtual Execution Environments (VEE '18)*, Williamsburg, VA, March 2018. (acceptance rate: 31.8%; 7/22)
23. **Wenwen Wang**, Stephen McCamant, Antonia Zhai, and Pen-Chung Yew. Enhancing Cross-ISA DBT Through Automatically Learned Translation Rules. In *Proceedings of the 23<sup>rd</sup> Architectural Support for Programming Languages and Operating Systems (ASPLOS '18)*, Williamsburg, VA, March 2018. (acceptance rate: 17.6%; 56/319)
24. **Wenwen Wang**, Pen-Chung Yew, Antonia Zhai, Stephen McCamant, Youfeng Wu, and Jayaram Bobba. Enabling Cross-ISA Offloading for COTS Binaries. In *Proceedings of the 15<sup>th</sup> ACM International Conference on Mobile Systems, Applications, and Services (MobiSys '17)*, Niagara Falls, NY, June 2017. (acceptance rate: 17.8%; 34/191)
25. **Wenwen Wang**, Pen-Chung Yew, Antonia Zhai, and Stephen McCamant. A General Persistent Code Caching Framework for Dynamic Binary Translation (DBT). In *Proceedings of the Annual Conference on USENIX Annual Technical Conference (USENIX ATC '16)*, Denver, CO, June 2016. (acceptance rate: 17.7%; 47/266)
26. Brandon Nesterenko, **Wenwen Wang**, and Qing Yi. Interactive Composition of Compiler Optimizations. In *Proceedings of the 28<sup>th</sup> International Workshop on Languages and Compilers for Parallel Computing (LCPC '15)*, Raleigh, NC, September 2015. (acceptance rate: 43.2%; 19/44)
27. **Wenwen Wang**, Zhenjiang Wang, Chenggang Wu, Pen-Chung Yew, Xipeng Shen, Xiang Yuan, Jianjun Li, Xiaobing Feng, and Yong Guan. Localization of Concurrency Bugs Using Shared Memory Access Pairs. In *Proceedings of the 29<sup>th</sup> IEEE/ACM International Conference on Automated Software Engineering (ASE '14)*, Vasteras, Sweden, September 2014. (acceptance rate: 19.9%; 55/276)
28. Xiang Yuan, Zhenjiang Wang, Chenggang Wu, Pen-Chung Yew, **Wenwen Wang**, Jianjun Li, and Di Xu. Synchronization Identification through On-the-Fly Test. In *Proceedings of the 2013 European Conference on Parallel Processing (Euro-Par '13)*, Aachen, Germany, August 2013. (acceptance rate: 26.8%; 70/261)

### *Journal*

29. Zhang Jiang, Ying Chen, Xiaoli Gong, Jin Zhang, **Wenwen Wang**, and Pen-Chung Yew, JiuJITsu: Removing Gadgets with Safe Register Allocation for JIT Code Generation, *ACM Transactions on Architecture and Code Optimization*, Volume: 21, Issue: 1, 2023.
30. Shiyang Li, Ruiqi Tang, Jingyu Zhu, Ziyi Zhao, Xiaoli Gong, **Wenwen Wang**, Jin Zhang, and Pen-Chung Yew, Liberator: A Data Reuse Framework for Out-of-Memory Graph Computing on GPUs, *IEEE Transactions on Parallel and Distributed Systems*, Volume: 34, Issue: 6, 2023.

31. Hengyi Li, Zhichen Wang, Xuebin Yue, **Wenwen Wang**, Hiroyuki Tomiyama, and Lin Meng, An Architecture Level Analysis on Deep Learning Models for Low-Impact Computations, *Artificial Intelligence Review*, 2022.
32. Hengyi Li, Xuebin Yue, Zhichen Wang, Zhilei Chai, **Wenwen Wang**, Hiroyuki Tomiyama, and Lin Meng, Optimizing the Deep Neural Networks by Layer-Wise Refined Pruning and the Acceleration on FPGA, Volume 2022, Article ID 8039281.
33. Jin Wu, Jian Dong, Ruili Fang, Wen Zhang, **Wenwen Wang**, and Decheng Zuo, WDBT: Non-Volatile Memory Wear Characterization and Mitigation for DBT Systems, *Journal of Systems and Software*, Volume 187, May 2022, 111247.
34. **Wenwen Wang**, Chenggang Wu, Tongxin Bai, Zhenjiang Wang, Xiang Yuan, and Huimin Cui. A Pattern Translation Method for Flags in Binary Translation. *Journal of Computer Research and Development*, 51(10): 2336-2347, 2014.
35. **Wenwen Wang**, Chenggang Wu, Paruj Ratanaworabhan, Xiang Yuan, Zhenjiang Wang, Jianjun Li, and Xiaobing Feng. Dynamically Tolerating and Detecting Asymmetric Races. *Journal of Computer Research and Development*, 51(8): 1748-1763, 2014.

#### *Technical Report*

36. Lin Meng, **Wenwen Wang**, and Shigeru Oyanagi. A Comprehensive Analysis of Branch Prediction in Multi-core Processors. *Information Processing Society of Japan Special Interest Group on Embedded Systems (IPJS-EMB)*, 2016-EMB-41: 1-5, 2016.

#### *Patent*

37. Chenggang Wu and **Wenwen Wang**. Method and System for Translating Indirect Branch Instructions in Binary Translation. *China Patent 200910237389.0*, Authorization date: August 2013.

#### *Poster*

38. Yuxuan Li, Xiaoli Gong, and **Wenwen Wang**. Orthrus: A Novel Block I/O Framework for Embedded Virtualization. In *Proceedings of ACM Symposium on Operating Systems Principles (SOSP '17)*, POSTER, Shanghai, China, October 2017.
39. **Wenwen Wang**, Chenggang Wu, Pen-Chung Yew, Xiang Yuan, Zhenjiang Wang, Jianjun Li, and Xiaobing Feng. Concurrency Bug Localization using Shared Memory Access Pairs. In *Proceedings of the 2014 ACM SIGPLAN Symposium on Principles and Practice of Parallel Programming (PPoPP '14)*, POSTER, Orlando, Florida, USA, February 2014. (acceptance rate: 26.3%; 47/179)

### INVITED TALKS

- ATAIT 2021 08/2021  
The 3<sup>rd</sup> International Symposium on Advanced Technologies and Applications in Internet of Things  
Title: Enhancing Mobile + IoT Computing through Computation Offloading
- Nankai University 05/2020  
Title: Efficient and Scalable Cross-ISA Virtualization of Hardware Transactional Memory
- Alibaba Group 04/2020  
Title: Efficient Cross-ISA Virtualization
- College of Engineering, University of Georgia 09/2019  
Title: Toward Efficient Mobile Computation Offloading

## SELECTED AWARDS AND HONORS

- M. G. Michael Award 2021
- Best Paper Finalists of the ACM/IEEE Symposium on Code Generation and Optimization (CGO) 2020
- Excellent Graduate Student of State Key Laboratory of Computer Architecture 2013
- Second Class Award of Science and Technology Prize of Beijing Municipal People's Government 2012
- Excellent Graduate Student of State Key Laboratory of Computer Architecture 2011
- Excellent Research Assistant of State Key Laboratory of Computer Architecture 2010
- Outstanding Graduates of Colleges and Universities in Beijing Area 2007
- The HP Excellent Student Scholarship in China 2006

## PROFESSIONAL ACTIVITIES

- *Organizing Committee*
  - The 47<sup>th</sup> International Conference on Software Engineering (ICSE '25)
  - The 27<sup>th</sup> IEEE International Symposium on High-Performance Computer Architecture (HPCA '21)
  - International Workshop on Reconfigurable Acceleration in Datacenters (co-located with ICS '18)
- *Program Committee*
  - The ACM International Conference on the Foundations of Software Engineering (FSE '24)
  - The 41<sup>st</sup> IEEE International Conference on Computer Design (ICCD '23)
  - The 39<sup>th</sup> Annual Computer Security Applications Conference (ACSAC '23)
  - The 38<sup>th</sup> IEEE/ACM International Conference on Automated Software Engineering (ASE '23)
  - The 32<sup>nd</sup> ACM International Symposium on High-Performance Parallel and Distributed Computing (HPDC '23)
  - The 25<sup>th</sup> IEEE Cluster Conference (CLUSTER '23)
  - The 40<sup>th</sup> IEEE International Conference on Computer Design (ICCD '22)
  - The 31<sup>st</sup> International Conference on Parallel Architectures and Compilation Techniques (PACT '22)
  - The 51<sup>st</sup> International Conference on Parallel Processing (ICPP '22)
  - The 31<sup>st</sup> ACM International Symposium on High-Performance Parallel and Distributed Computing (HPDC '22)
  - The 27<sup>th</sup> ACM SIGPLAN Annual Symposium on Principles and Practice of Parallel Programming (PPoPP '22)
  - The 20<sup>th</sup> IEEE/ACM International Symposium on Code Generation and Optimization (CGO '22)
  - The 2021 IEEE International Symposium on Workload Characterization (IISWC '21)
  - The 39<sup>th</sup> IEEE International Conference on Computer Design (ICCD '21)
  - The 30<sup>th</sup> International Conference on Parallel Architectures and Compilation Techniques (PACT '21)
  - The 16<sup>th</sup> ACM Asia Conference on Computer and Communications Security (AsiaCCS '21)
  - The 2020 IEEE International Symposium on Workload Characterization (IISWC '20)
  - The 38<sup>th</sup> IEEE International Conference on Computer Design (ICCD '20)
  - The 2017 IEEE International Symposium on Workload Characterization (IISWC '17)
- *External Review Committee*
  - The 54<sup>th</sup> IEEE/ACM International Symposium on Microarchitecture (MICRO '21)
  - The 26<sup>th</sup> International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS '21)

- *Reviewer*

ACM Transactions on Software Engineering and Methodology

The 31<sup>st</sup> USENIX Security Symposium (USENIX Security '22)

Connection Science

ACM Transactions on Privacy and Security

ACM Transactions on Embedded Computing Systems

IEEE Transactions on Computers

Journal of Computer Science and Technology

The 28<sup>th</sup> International Conference on Parallel Architectures and Compilation Techniques (PACT '19)

The 22<sup>nd</sup> Design, Automation and Test in Europe (DATE '19)

The 25<sup>th</sup> ACM Conference on Computer and Communications Security (CCS '18)

The 27<sup>th</sup> International Conference on Parallel Architectures and Compilation Techniques (PACT '18)

The 27<sup>th</sup> USENIX Security Symposium (USENIX Security '18)

The 2018 USENIX Annual Technical Conference (USENIX ATC '18)

The 26<sup>th</sup> International Conference on Parallel Architectures and Compilation Techniques (PACT '17)

The 15<sup>th</sup> IEEE International Conference on High Performance Computing and Communications (HPCC '13)

The 2013 International Conference on Advanced Parallel Processing Technology (APPT '13)

The 33<sup>rd</sup> ACM SIGPLAN conference on Programming Language Design and Implementation (PLDI '12)

The 3<sup>rd</sup> Workshop on Architectural and Micro-Architectural Support for Binary Translation (AMASBT '10)

ACM Transactions on Architecture and Code Optimization (TACO)

Frontiers of Computer Science