

Wenwen Wang

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RESEARCH INTERESTS

- Security, privacy, reliability, and fault tolerance using static and runtime program analysis techniques
- System virtualization for high-performance and energy-efficient cloud computing and data centers
- Software testing, debugging, diagnosis, and verification for parallel and concurrent computing systems

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. Jin Wu, Jian Dong, Ruili Fang, Wen Zhang, **Wenwen Wang**, Decheng Zuo, FADATest: Fast and Adaptive Performance Regression Testing of Dynamic Binary Translation Systems, Accepted to *the 44th International Conference on Software Engineering (ICSE '22)*, Pittsburgh, PA, USA, May 2022.
2. 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.
3. 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 50th International Conference on Parallel Processing (ICPP '21)*, Virtual, August 2021.
4. **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.
5. 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 31st ACM Great Lakes Symposium on VLSI (GLSVLSI '21)*, Virtual, June 2021.

6. **Wenwen Wang** and Pei-Hung Lin, Does It Matter? – OMPSanitizer: An Impact Analyzer of Reported Data Races in OpenMP Programs, In *Proceedings of the 35th ACM International Conference on Supercomputing (ICS '21)*, Virtual, June 2021.
7. 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 17th ACM SIGPLAN/SIGOPS International Conference on Virtual Execution Environments (VEE '21)*, Virtual, April 2021.
8. **Wenwen Wang**, Helper Function Inlining in Dynamic Binary Translation, In *Proceedings of the 30th ACM SIGPLAN International Conference on Compiler Construction (CC '21)*, Virtual, March 2021.
9. 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 19th Annual IEEE/ACM International Symposium on Code Generation and Optimization (CGO '21)*, Virtual, March 2021.
10. 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.
11. Jin Wu, Jian Dong, Ruili Fang, **Wenwen Wang**, Decheng Zuo, PerfDBT: Efficient Performance Regression Testing of Dynamic Binary Translation, In *Proceedings of the 38th IEEE International Conference on Computer Design (ICCD '20)*, Hartford, Connecticut, USA, October 2020.
12. 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 53rd IEEE/ACM International Symposium on Microarchitecture (MICRO '20)*, Athens, Greece, October 2020.
13. 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 49th International Conference on Parallel Processing (ICPP '20)*, Edmonton, AB, Canada, August 2020.
14. **Wenwen Wang**, Pen-Chung Yew, Antonia Zhai, and Stephen McCamant, Efficient and Scalable Cross-ISA Virtualization of Hardware Transactional Memory. In *Proceedings of the 18th Annual IEEE/ACM International Symposium on Code Generation and Optimization (CGO '20)*, San Diego, CA, February 2020. (acceptance rate: 27%, 25/92)
15. 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 17th IEEE International Symposium on Parallel and Distributed Processing with Applications (ISPA '19)*, Xiamen, China, December 2019.
16. 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)
17. **Wenwen Wang**, Kangjie Lu, and Pen-Chung Yew, Check It Again: Detecting Lacking-Recheck Bugs in OS Kernels. In *Proceedings of the 25th ACM Conference on Computer and Communications Security (CCS '18)*, Toronto, Canada, October 2018. (acceptance rate: 17.4%; 134/771)

18. **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 14th ACM SIGPLAN/SIGOPS International Conference on Virtual Execution Environments (VEE '18)*, Williamsburg, VA, March 2018. (acceptance rate: 31.8%; 7/22)
19. **Wenwen Wang**, Stephen McCamant, Antonia Zhai, and Pen-Chung Yew. Enhancing Cross-ISA DBT Through Automatically Learned Translation Rules. In *Proceedings of the 23rd Architectural Support for Programming Languages and Operating Systems (ASPLOS '18)*, Williamsburg, VA, March 2018. (acceptance rate: 17.6%; 56/319)
20. **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 15th ACM International Conference on Mobile Systems, Applications, and Services (MobiSys '17)*, Niagara Falls, NY, June 2017. (acceptance rate: 17.8%; 34/191)
21. **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)
22. Brandon Nesterenko, **Wenwen Wang**, and Qing Yi. Interactive Composition of Compiler Optimizations. In *Proceedings of the 28th International Workshop on Languages and Compilers for Parallel Computing (LCPC '15)*, Raleigh, NC, September 2015. (acceptance rate: 43.2%; 19/44)
23. **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 29th IEEE/ACM International Conference on Automated Software Engineering (ASE '14)*, Vasteras, Sweden, September 2014. (acceptance rate: 19.9%; 55/276)
24. 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

25. **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.
26. **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

27. 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 (IPJSJ-EMB)*, 2016-EMB-41: 1-5, 2016.

Patent

28. 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

29. 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.
30. **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 3rd 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 and Secure Cross-ISA Virtualization
- College of Engineering, University of Georgia 09/2019
Title: Toward Efficient and Secure 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

- *Program Committee*
The 31st International Conference on Parallel Architectures and Compilation Techniques (PACT '22)
The 51st International Conference on Parallel Processing (ICPP '22)
The 31st ACM International Symposium on High-Performance Parallel and Distributed Computing (HPDC '22)
The 27th ACM SIGPLAN Annual Symposium on Principles and Practice of Parallel Programming (PPoPP '22)
The 20th IEEE/ACM International Symposium on Code Generation and Optimization (CGO '22)
The 2021 IEEE International Symposium on Workload Characterization (IISWC '21)
The 39th IEEE International Conference on Computer Design (ICCD '21)
The 30th International Conference on Parallel Architectures and Compilation Techniques (PACT '21)

The 16th ACM Asia Conference on Computer and Communications Security (AsiaCCS '21)

The 2020 IEEE International Symposium on Workload Characterization (IISWC '20)

The 38th IEEE International Conference on Computer Design (ICCD '20)

The 2017 IEEE International Symposium on Workload Characterization (IISWC '17)

- *External Review Committee*

The 54th IEEE/ACM International Symposium on Microarchitecture (MICRO '21)

The 26th International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS '21)

- *Organization Committee*

The 27th IEEE International Symposium on High-Performance Computer Architecture (HPCA '21)

International Workshop on Reconfigurable Acceleration in Datacenters (co-located with ICS '18)

- *Reviewer*

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 28th International Conference on Parallel Architectures and Compilation Techniques (PACT '19)

The 22nd Design, Automation and Test in Europe (DATE '19)

The 25th ACM Conference on Computer and Communications Security (CCS '18)

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

The 27th USENIX Security Symposium (USENIX Security '18)

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

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

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

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

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

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

ACM Transactions on Architecture and Code Optimization (TACO)

Frontiers of Computer Science