Guoliang Jin

Contact Information

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Research Interests

Software systems reliability, focusing on concurrency issues and performance issues in cloud systems, multi-core systems, and web applications.

Employment

Assistant Professor, January 2015 – present
Department of Computer Science, North Carolina State University

Education

University of Wisconsin–Madison, Madison, WI
Ph.D. in Computer Sciences, 2014
Thesis: Diagnosing and Fixing Concurrency Bugs (Advisor: Prof. Shan Lu)

University of Science and Technology of China, Hefei, Anhui, China
B.E. in Computer Science and Technology, 2007

Selected Honors and Awards

- The Most Receptive Undergraduate Professor Outside of Class by the ACM / AITP student organization at NC State, 2020.
- SIGPLAN Research Highlights for the paper "Automated Atomicity-Violation Fixing" published in PLDI 2011.
- The 26th Guo Moruo Scholarship, University of Science and Technology of China, 2007.

Publications (Names of my students and mine are highlighted)

1. **Zhengyi Qiu**, **Shudi Shao**, **Qi Zhao**, and **Guoliang Jin**. "Understanding and Detecting Server-Side Request Races in Web Applications". In *Proceedings of the 2021 Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering*, ESEC/FSE '21. Athens, Greece, August 2021. To appear
2. Jingzhu He, Ting Dai, Xiaohui Gu, and **Guoliang Jin**. "HangFix: Automatically Fixing Software Hang Bugs for Production Cloud Systems". In *Proceedings of the 11th ACM Symposium on Cloud Computing*, SoCC '20, page 344–357, 2020. Association for Computing Machinery, New York, NY, USA
3. **Tao Wang**, **Xiao Yu**, **Zhengyi Qiu**, **Guoliang Jin**, and Frank Mueller. "BARRIERFINDER: Recognizing Ad Hoc Barriers". *Empirical Software Engineering*, 25:4676–4706, November 2020, Springer
4. **Shudi Shao**, **Zhengyi Qiu**, **Xiao Yu**, Wei Yang, **Guoliang Jin**, Tao Xie, and Xintao Wu. "Database-Access Performance Antipatterns in Database-Backed Web Applications". In *2020 IEEE International Conference on Software Maintenance and Evolution*, ICSME '20, pages 58–69. Adelaide, Australia, October 2020. Institute of Electrical and Electronics Engineers
5. **Tao Wang**, **Xiao Yu**, **Zhengyi Qiu**, **Guoliang Jin**, and Frank Mueller. "BARRIERFINDER: Recognizing Ad Hoc Barriers". In *2019 IEEE International Conference on Software Maintenance and Evolution*, ICSME '19, pages 323–327. Cleveland, OH, USA, September 2019. Institute of Electrical and Electronics Engineers
6. **Qi Zhao**, **Zhengyi Qiu**, and **Guoliang Jin**. "Semantics-aware Scheduling Policies for Synchronization Determinism". In *Proceedings of the 24th Symposium on Principles and Practice of Parallel Programming*, PPoPP '19. Washington, District of Columbia, February 2019. Association for Computing Machinery

7. **Xiao Yu** and **Guoliang Jin**. "Dataflow Tunneling: Mining Inter-request Data Dependencies for Request-based Applications". In *Proceedings of the 40th International Conference on Software Engineering*, ICSE '18, page 586–597. Gothenburg, Sweden, May 2018. Association for Computing Machinery
8. **Xiao Yu**, Pallavi Joshi, Jianwu Xu, **Guoliang Jin**, Hui Zhang, and Guofei Jiang. "CloudSeer: Workflow Monitoring of Cloud Infrastructures via Interleaved Logs". In *Proceedings of the Twenty-First International Conference on Architectural Support for Programming Languages and Operating Systems*, ASPLOS '16. Atlanta, Georgia, USA, April 2016. Association for Computing Machinery
9. Rui Gu, **Guoliang Jin**, Linhai Song, Linjie Zhu, and Shan Lu. "What Change History Tells Us About Thread Synchronization". In *Proceedings of the 2015 10th Joint Meeting on Foundations of Software Engineering*, ESEC/FSE '15. Bergamo, Italy, September 2015. Association for Computing Machinery
10. Daniel J. Dean, Peipei Wang, Xiaohui Gu, William Enck, and **Guoliang Jin**. "Automatic Server Hang Bug Diagnosis: Feasible Reality or Pipe Dream?". In *Proceedings of the 2015 IEEE International Conference on Autonomic Computing*, ICAC '15. Grenoble, France, July 2015. Institute of Electrical and Electronics Engineers
11. Dongdong Deng, **Guoliang Jin**, Marc de Kruijf, Ang Li, Ben Liblit, Shan Lu, Shanxiang Qi, Jinglei Ren, Karthikeyan Sankaralingam, Linhai Song, Yongwei Wu, Mingxing Zhang, Wei Zhang, and Weimin Zheng. "Fixing, preventing, and recovering from concurrency bugs". *Science China Information Sciences*, 58(5):1–18, May 2015, Springer
12. Joy Arulraj, **Guoliang Jin**, and Shan Lu. "Leveraging the Short-Term Memory of Hardware to Diagnose Production-Run Software Failures". In *Proceedings of the 19th International Conference on Architectural Support for Programming Languages and Operating Systems*, ASPLOS '14. Salt Lake City, Utah, USA, March 2014. Association for Computing Machinery
13. Bill Harris, **Guoliang Jin**, Shan Lu, and Somesh Jha. "Validating Library Usage Interactively". In *Proceedings of the 25th international conference on Computer Aided Verification*, CAV '13. Saint Petersburg, Russia, July 2013. Springer
14. Joy Arulraj, Po-Chun Chang, **Guoliang Jin**, and Shan Lu. "Production-Run Software Failure Diagnosis via Hardware Performance Counters". In *Proceedings of the 18th International Conference on Architectural Support for Programming Languages and Operating Systems*, ASPLOS '13. Houston, Texas, USA, March 2013. Association for Computing Machinery
15. **Guoliang Jin**, Wei Zhang, Dongdong Deng, Ben Liblit, and Shan Lu. "Automated Concurrency-Bug Fixing". In *Proceedings of the 10th USENIX Conference on Operating Systems Design and Implementation*, OSDI '12. Hollywood, CA, USA, October 2012. USENIX Association
16. **Guoliang Jin**, Linhai Song, Xiaoming Shi, Joel Scherpelz, and Shan Lu. "Understanding and Detecting Real-World Performance Bugs". In *Proceedings of the 33rd ACM SIGPLAN Conference on Programming Language Design and Implementation*, PLDI '12. Beijing, China, June 2012. Association for Computing Machinery
17. **Guoliang Jin**, Linhai Song, Wei Zhang, Shan Lu, and Ben Liblit. "Automated Atomicity-Violation Fixing". In *Proceedings of the 32nd ACM SIGPLAN Conference on Programming Language Design and Implementation*, PLDI '11. San Jose, California, USA, June 2011. Association for Computing Machinery
18. Wei Zhang, Junghee Lim, Ramya Olichandran, Joel Scherpelz, **Guoliang Jin**, Shan Lu, and Thomas Reps. "ConSeq: Detecting Concurrency Bugs through Sequential Errors". In *Proceedings of the 16th International Conference on Architectural Support for Programming Languages and Operating Systems*, ASPLOS '11. Newport Beach, California, USA, March 2011. Association for Computing Machinery

19. **Guoliang Jin**, Aditya Thakur, Ben Liblit, and Shan Lu. "Instrumentation and Sampling Strategies for Cooperative Concurrency Bug Isolation". In *Proceedings of the ACM International Conference on Object Oriented Programming Systems Languages and Applications*, OOPSLA '10. Reno/Tahoe, Nevada, USA, October 2010. Association for Computing Machinery

Ph.D. Students

- Tao Wang, co-advised with Frank Mueller, graduated in Fall 2019, now a Postdoctoral Researcher at Stanford University.
- Xiao Yu, graduated in Summer 2018, now a Researcher at NEC Laboratories America, Inc.
- Currently advising: Qi Zhao, Shudi Shao, Zhengyi Qiu

Teaching

- CSC 246 Concepts and Facilities of Operating Systems, Fall 2016, Fall 2017, Spring 2019, Spring 2020, Fall 2020
- CSC 501 Operating Systems Principles, Spring 2015, Fall 2015, Fall 2017, Fall 2018, Fall 2019, Fall 2020
- CSC 591/791 Reliable Software Systems, Spring 2016, Spring 2017, Spring 2018

Professional Services

- Workshop co-chair for the 40th IEEE International Performance Computing and Communications Conference (IPCCC '21).
- Program committee member for 2021 International Conference on Languages, Compilers, and Tools for Embedded Systems (LCTES '21).
- Program committee member for the 25th Symposium on Principles and Practice of Parallel Programming (PPoPP '20).
- External review committee for the 25th ACM International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS '20).
- Program committee member for the 2019 International Symposium on Advanced Parallel Processing Technology (APPT '19).
- External review committee for the 24th ACM International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS '19).
- Local arrangements co-chair for 2018 IEEE International Symposium on Workload Characterization (IISWC '18).
- Finance chair for the 23rd ACM International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS '18).
- Publicity chair for the 22nd ACM International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS '17).
- Program committee member for Symposium on Operating Systems Principles Student Research Competition 2017 (SOSP '17 SRC).
- Program committee member for the 15th Asian Symposium on Programming Languages and Systems (APLAS '17).
- Program committee member for the 11th International Conference on Advanced Parallel Processing Technology (APPT '15).
- Sub reviewer for 35th ACM International Conference on Supercomputing (ICS '21), 2017 USENIX Annual Technical Conference (USENIX ATC '17), 28th ACM Symposium on Parallelism in Algorithms and Architectures (SPAA '16) and 2016 International Symposium on Code Generation and Optimization (CGO '16).

- Journal reviewer for "ACM Transactions on Architecture and Code Optimization," "ACM Transactions on Programming Languages and Systems," "IEEE Transactions on Computer," "IEEE Transactions on Parallel and Distributed Systems," "IEEE Transactions on Software Engineering," "IEEE Transactions on Reliability," "IEEE Access," "Journal of Computer Science and Technology," "Journal of Systems and Software," "Journal of Parallel and Distributed Computing," "Software Testing, Verification and Reliability," and "Concurrency and Computation: Practice and Experience,"

Grants

- SHF: Small: Inter-Request Workflow and Dataflow in Web Applications: a Modeling Framework and its Applications. National Science Foundation Award #2008056. August 15, 2020 - July 31, 2023. $350,000 (Sole-PI)