

Yuan, Xinhao

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EDUCATION

- Ph.D. Columbia University, Department of Computer Science. Adviser: Junfeng Yang 2012/08-2019/05
- B.Eng. Tsinghua University, Department of Computer Science and Technology. 2007/09-2011/07

EXPERIENCE

- Software Engineer, Google 2019/08-present
Working on the infrastructure of scalable and automated software testing "fuzzing" in Google.
- Research Assistant, Columbia University, Advisor: Junfeng Yang 2012/08-2019/05
 - Led research projects on enhancing reliability of concurrent software systems:
 - Morpheus [1]**. An effective concurrency testing tool for Erlang/Elixir using partial order sampling and program analysis that reduces redundant exploration. Open-sourced on <https://github.com/xinhaoyuan/morpheus>.
 - Partial order sampling [2]**. An effective randomized algorithm for concurrency testing that leverages partial order semantics to provide strong formal guarantees of error-detection and find errors in any partial orders of a program.
 - Txit [5]**. A framework to make lock-free data structures manageable to verify by adding artificial memory transactions.
 - Contributed to other projects in the research group, including **Shuffler [4]**, **Grandet [3]**, and **AppDoctor [6]**.
- Research Intern, Microsoft Research. Mentor: Suman Nath 2017/05-2017/08
Implemented the C++ instrumentation/orchestration framework for the Azure storage as a part of **Torch**, a framework for analyzing distributed systems and services.
- Research Intern, Microsoft/Microsoft Research. Mentor: Cheng Huang 2016/01-2016/05
Applied systematic concurrency testing on the Azure storage infrastructure to improve its reliability.
- Research Intern, Microsoft Research. Mentor: Lidong Zhou 2015/06-2015/08
Designed and built a research prototype of **DSOAP**, a distributed computing platform specialized for social analytics.
- Research Intern at System Research Group, Microsoft Research Asia. Mentor: Ming Wu 2009/11-2011/06
Implemented the TPC-C benchmark for **Hyder [7]** database system. Awarded "Stars of Tomorrow" internship certificate for the excellent performance.

PUBLICATIONS

- [1] **X. Yuan** and J. Yang. "Effective Concurrency Testing for Distributed Systems." In: *Proceedings of the Twenty-Fifth International Conference on Architectural Support for Programming Languages and Operating Systems*. ASPLOS '20. Lausanne, Switzerland, 2020, pp. 1141–1156.
- [2] **X. Yuan**, J. Yang, and R. Gu. "Partial Order Aware Concurrency Sampling." In: *Computer Aided Verification*. Ed. by H. Chockler and G. Weissenbacher. Cham, 2018, pp. 317–335.
- [3] Y. Tang, G. Hu, **X. Yuan**, L. Weng, and J. Yang. "Grandet: A Unified, Economical Object Store for Web Applications." In: *Proceedings of the Seventh ACM Symposium on Cloud Computing*. SoCC '16. Santa Clara, CA, USA, 2016, pp. 196–209.
- [4] D. Williams-King, G. Gobieski, K. Williams-King, J. P. Blake, **X. Yuan**, P. Colp, M. Zheng, V. P. Kemerlis, J. Yang, and W. Aiello. "Shuffler: Fast and Deployable Continuous Code Re-Randomization." In: *Proceedings of the 12th USENIX Conference on Operating Systems Design and Implementation*. OSDI'16. Savannah, GA, USA, 2016, pp. 367–382.
- [5] **X. Yuan**, D. Williams-King, J. Yang, and S. Sethumadhavan. "Making Lock-Free Data Structures Verifiable with Artificial Transactions." In: *Proceedings of the 8th Workshop on Programming Languages and Operating Systems*. PLOS '15. Monterey, California, 2015, pp. 39–45.
- [6] G. Hu, **X. Yuan**, Y. Tang, and J. Yang. "Efficiently, Effectively Detecting Mobile App Bugs with AppDoctor." In: *Proceedings of the Ninth European Conference on Computer Systems*. EuroSys '14. Amsterdam, The Netherlands, 2014.
- [7] P. A. Bernstein, C. W. Reid, M. Wu, and **X. Yuan**. "Optimistic concurrency control by melding trees." In: *Proceedings of the VLDB Endowment* 4.11 (2011), pp. 944–955.
- [8] S. Jiang, L. Zhang, **X. Yuan**, H. Hu, and Y. Chen. "S-FTL: An efficient address translation for flash memory by exploiting spatial locality." In: *2011 IEEE 27th Symposium on Mass Storage Systems and Technologies (MSST)*. IEEE. 2011, pp. 1–12.

AWARDS

- 27th place in 37th Annual World Finals of the ACM International Collegiate Programming Contest 2013
- Champion of ACM/ICPC '12, Greater New York Region 2012
- Gold medal in the National Olympiad in Informatics '06, China 2006