

Xiang (Jenny) Ren

Ph.D. Candidate in Computer Engineering
University of Toronto

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EDUCATION

Ph.D. in Computer Engineering
M.A.Sc. in Computer Engineering
University of Toronto
Advisor: Ding Yuan

Sep 2017 - Aug 2024 (expected)
Sep 2015 - Mar 2018

B.A.Sc. with Honours in Electrical Engineering
University of Toronto

Sep 2010 - June 2015

RESEARCH INTERESTS

Improving the performance and reliability of systems software (including operating systems, distributed systems, database systems, language runtimes, etc.) through performance analysis and automating performance or failure diagnosis.

PUBLICATIONS

- [1] Xiang (Jenny) Ren, Sitao Wang, Zhuqi Jin, David Lion, Adrian Chiu, Tianyin Xu, and Ding Yuan. Relational Debugging – Pinpointing Root Causes of Performance Problems. In *Proceedings of the 17th USENIX Symposium on Operating Systems Design and Implementation (OSDI'23)*, July 2023.
- [2] Tanakorn Leesatapornwongsa, Xiang Ren, and Suman Nath. FlakeRepro: automated and efficient reproduction of concurrency-related flaky tests. In *Proceedings of the 30th ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE'22)*, November 2022. (Industry track)
- [3] Ruibin Li, Xiang Ren, Xu Zhao, Siwei He, Michael Stumm, and Ding Yuan. ctFS: Eliminating File Indexing with Contiguous File System on Persistent Memory. In *Proceedings of the 20th USENIX Conference on File and Storage Technologies (FAST 22)*, February 2022.
- [4] Xiang (Jenny) Ren, Kirk Rodrigues, Luyuan Chen, Camilo Vega, Michael Stumm, and Ding Yuan. An Analysis of Performance Evolution of Linux's Core Operations. In *Proceedings of the 27th ACM Symposium on Operating Systems Principles (SOSP19)*, October 2019.
- [5] Yongle Zhang, Serguei Makarov, Xiang Ren, David Lion, and Ding Yuan. Pensieve: Non-Intrusive Failure Reproduction for Distributed Systems using the Event Chaining Approach. In *Proceedings of the 26th Symposium on Operating Systems Principles (SOSP '17)*, October 2017.

IMPACT & VISIBILITY

- Root causes diagnosed by Perspect[1] helped MongoDB developers close two open bugs: MongoDB-57221 and MongoDB-56274; Perspect is requested by the MMTk memory management framework and attracted interest from CockroachDB.
- [3] is invited to appear in USENIX ;login: and ACM Transaction on Storage (TOS) and given best paper honorable mention.
- [4] is featured by the *morning paper* and LEBench[4] is deployed by Amazon.

PROFESSIONAL EXPERIENCE

- **Software Engineering Intern**, MongoDB, Mentor: Daniel Gottlieb June - August 2022
Investigated the root causes of the performance creep between MongoDB v4.4 and v6.0.
- **Research Intern**, Microsoft Research Redmond, Mentor: Suman Nath June - August 2020
Automated the reproduction of flaky tests in cloud systems.
- **Research Assistant**, University of Toronto, Advisor: Ding Yuan May - August 2014
Automated log analysis of distributed systems.
- **Software Engineering Intern**, Marin Software, San Francisco May 2013 - May 2014
Carried out data engineering, web programming, and created automated integration tests.
- **Research Assistant**, University of Toronto, Advisor: Tarek Abdelrahman May - August 2012
Built support of parallel programming pragmas in the LLVM compiler infrastructure.

AWARDS & SCHOLARSHIPS

- University of Toronto Fellowship 2019
- Edward S. Rogers Sr. Graduate Scholarships 2018
- Queen Elizabeth II Graduate Scholarship 2017
- Ontario Graduate Scholarship 2016
- Bell Scholarship 2015

INVITED TALKS

- Relational Debugging – Pinpointing Root Causes of Performance Problems.
 - The 17th USENIX Symposium on Operating Systems Design and Implementation (OSDI'23), Boston, USA, July 2023.
 - Australian National University Foundations Seminar, August 2023.
- An Analysis of Performance Evolution of Linux's Core Operations.
 - The 27th Symposium on Operating Systems Principles (SOSP19), Huntsville, ON, Canada, October 2019.

SERVICE & OUTREACH

- Assisted program committee members in reviewing submissions for:
 - 2023 OSDI, SOSP
 - 2022 OSDI
 - 2021 SOSP, ASPLOS
 - 2020 NSDI
 - 2019 HotOS
 - 2018 OSDI
 - 2017 SOSP
 - 2015 ASPLOS
 - 2014 OSDI
- 2021 SOSP vice session chair
- 2019 SOSP volunteer
- Attended the Diversity Workshop at SOSP'15, SOSP'17, SOSP'19, and SOSP'21. The Diversity Workshop is a forum to support historically underrepresented students in systems research.

TEACHING

- **Teaching Assistant**, ECE 1747H Parallel Programming 2020
Graded and assisted students with final projects.
- **Teaching Assistant**, ECE297 Design and Communication 2019
Graded and assisted students with programming assignments.
- **Teaching Assistant**, ECE 244 Programming Fundamentals 2015, 2016, 2018
Taught and developed materials for weekly tutorial sessions.
Assisted students with programming assignments.
- **Teaching Assistant**, CSC369 Operating Systems 2018
Graded and assisted students with programming assignments.
- **Teaching Assistant**, APS105 Computer Fundamentals 2017
Graded and assisted students with programming assignments. **Student rating: 6.7/7**
- **Teaching Assistant**, ECE344 Operating Systems 2016
Graded and assisted students with programming assignments.