

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

- Conducting performance analysis and creating techniques to automate performance diagnosis for system software, including operating systems, language runtimes, databases, etc.
- Improving the reliability of system software, including distributed systems.
- Building performant software for emerging hardware.

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 and SOSP'19, 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.