Yang Chen

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Research Interests

My research lies at the intersection of software engineering (SE) and AI. I focus on (1) combining **program analysis with LLMs to address real-world problems**, e.g., **flaky tests repair** [5,6,7,13] and **SWE issue repair** [2]; (2) **synthetic data generation**, leveraging mutation testing to evaluate flakiness detection tools [8] and genetic algorithms to **benchmark LLMs** on multiple complex coding tasks with real-world difficulty [1,9]; I also study **LLM code reasoning** [4,10].

Prior research projects have equipped me with diverse skills and expertise in *neurosymbolic program analysis*, *genetic algorithms and LLM fine-tuning*, as well as software testing including *flaky tests detection & repair* (**accumulating to** 139 **patches accepted in real world**), *mutation testing* and *test suite minimization*.

My ongoing research focuses on building **agentic systems** that integrate SE knowledge and process-centric analysis of agentic systems.

Education

2022-Present **University of Illinois Urbana-Champaign (USA)**.
Ph.D. Candidate in Computer Science (Anticipated graduation: 2027 May)
Co-advisors: Reyhaneh Jabbarvand and Darko Marinov

2018–2022 **Huazhong University of Science and Technology (China)**.
B.Sc. in Computer Science

Publications

[1] FSE (under review) Evaluating the Generalizability of LLMs to Real-World Complexity .
Yang Chen, Shuyang Liu, and Reyhaneh Jabbarvand.

[2] FSE (under review) Enhancing SWE Issue Repair with Regression Tests.
Yang Chen, Toufique Ahmed, Reyhaneh Jabbarvand, and Martin Hirzel.

[3] OOPSLA (under review) Process-Centric Analysis of Agentic Software Systems.
Shuyang Liu, **Yang Chen**, Rahul Krishna, Saurabh Sinha, and Reyhaneh Jabbarvand.

[4] ICSE 2026 Assessing Coherency and Consistency of Code Execution Reasoning by LLMs [PDF] .
Changshu Liu, **Yang Chen**, and Reyhaneh Jabbarvand.
Proceedings of the 48th International Conference on Software Engineering. Rio de Janeiro. Brazil. April 2026.

[5] ISSTA 2024 Neurosymbolic Repair of Test Flakiness [PDF] .
Yang Chen and Reyhaneh Jabbarvand.
Proceedings of the 33rd ACM SIGSOFT International Symposium on Software Testing and Analysis. Vienna, Austria. September 2024.

[6] ICSE-SRC 2024 Flakiness Repair in the Era of Large Language Models [PDF] .
Yang Chen.
[2nd Place in Student Research Competition] Proceedings of the 46th International Conference on Software Engineering, Lisbon, Portugal. April 2024.

[7] ICSE-FTW 2024 (short paper) — Can ChatGPT Repair Non-Order-Dependent Flaky Tests? [PDF] .
Yang Chen and Reyhaneh Jabbarvand.
Flaky Test Workshop in Proceedings of the 46th International Conference on Software Engineering. Lisbon, Portugal. April 2024.

[8] ISSTA 2023 — Transforming Test Suites into Croissants [PDF] .
Yang Chen, Alperen Yildiz, Darko Marinov, and Reyhaneh Jabbarvand.
Proceedings of the 32nd ACM SIGSOFT International Symposium on Software Testing and Analysis, Seattle, USA. July 2023.

[9] FSE (under review) — Evaluating Code Reasoning Abilities of Large Language Models Under Real-World Settings .
Changshu Liu, Alireza Ghazanfari, **Yang Chen**, and Reyhaneh Jabbarvand.

[10] TSE (under review) — Can Large Language Models Reason About Code?.
Changshu Liu, Shizhuo Zhang, **Yang Chen**, and Reyhaneh Jabbarvand.

[11] preprint — Automated Bug Generation in the Era of Large Language Models [PDF] .
Ali Reza Ibrahimzada, **Yang Chen**, Ryan Rong, and Reyhaneh Jabbarvand.
arXiv Preprint, 2023.

[12] ICSE-Demo 2022 — iPFlakies: A Framework for Detecting and Fixing Python Order-Dependent Flaky Tests [PDF] .
Ruixin Wang, **Yang Chen**, and Wing Lam.
Demonstration Track, Proceedings of the 44th International Conference on Software Engineering, Pittsburgh, USA. May 2022.

[13] ICSE-FTW 2025 (short paper) — A Preliminary Study of Fixed Flaky Tests in Rust Projects on GitHub [PDF] .
Tom Schroeder, Minh Phan, and **Yang Chen**.
Flaky Test Workshop in Proceedings of the 47th International Conference on Software Engineering. Ottawa, Canada. April 2025.

Experience

2025 May – Aug — **IBM Research Scientist Intern**, *IBM Research, NY*.
Manager & Mentor: Martin Hirzel and Toufique Ahmed.

Selected Honors and Grants

2024 — Ranked 2nd in the 46th ACM Student Research Competition at ICSE 2024.
2023 — SIGSOFT CAPS Grants for ISSTA 2023, ICSE 2024, and ISSTA 2024.
2022 — Outstanding Graduate of Class 2022, Huazhong University of Science and Technology.

Academic Service

Reviewer: MSR 2024, TOSEM 2025.
Artifact Evaluation PC: ISSTA 2024, ISSTA 2025.
Research Track PC: MSR 2024.

Programming Skills

Python and Java.