

Yifan Xiong

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GitHub | Google Scholar

Education

University of Illinois Urbana-Champaign

Ph.D. Student in Computer Science; Advisor: *Prof. Yiling Lou*

Sep. 2026 - Present

Urbana-Champaign, IL

Nanjing University

B.Eng. in Software Engineering; GPA: 4.54/5.00

Sep. 2021 - Jul. 2025

Nanjing, China

Research Interests

Software engineering, formal methods, and programming languages, with a focus on software testing, formal and runtime verification, program analysis, and their intersections with AI and agentic systems.

Publications

- Jinglin Dai[†], **Yifan Xiong**[†], Lezhi Ma, Shangqing Liu, and Lei Bu. “Temporal Specification Oriented Fuzzing for Trigger-Action-Programming Smart Home Integrations.” *Proceedings of the 48th International Conference on Software Engineering (ICSE 2026), Research Track*. DOI | Project
- Ruixin Qin[†], **Yifan Xiong**[†], Yifei Lu, and Minxue Pan. “Demystifying and Assessing Code Understandability in Java Decompilation.” *arXiv preprint arXiv:2409.20343*, 2024. arXiv
- Chun Li, **Yifan Xiong**, Zhong Li, Wenhua Yang, and Minxue Pan. “Mobile Test Script Generation from Natural Language Descriptions.” *2023 IEEE 23rd International Conference on Software Quality, Reliability, and Security (QRS)*, pp. 348–359, 2023. DOI

[†] Equal contribution.

Academic Positions

University of Illinois Urbana-Champaign

Teaching Assistant, CS 527: *Software Testing and Analysis*

Fall 2026

Urbana-Champaign, IL

Software Engineering Group, Nanjing University

Research Assistant

Aug. 2025 - Dec. 2025

Nanjing, China

Research Experience

HAFuzz: Temporal Specification Oriented Fuzzing for Smart Home Integrations

Nov. 2023 - Oct. 2025

Research Assistant; Advisor: *Prof. Lei Bu, Nanjing University*

- Led the full implementation, including modeling IFTTT-style IoT systems, developing a specialized runtime-verification fuzzer, designing and refining seed-selection algorithms, and improving overall efficiency.
- Organized and conducted experiments comparing our tool with model-checking-based approaches on a comprehensive, carefully curated dataset, demonstrating improvements in efficiency and accuracy.

Extending NNSmith with LLM-Generated API Constraints

Jul. 2024 - Nov. 2024

Research Assistant; Advisor: *Prof. Lingming Zhang, University of Illinois Urbana-Champaign*

- Extended NNSmith’s API-constraint workflow with LLM-generated candidates, expanding the set of supported constraints and the diversity of generated deep-learning models.
- Developed augmentation strategies to improve the accuracy of generated API constraints.
- Designed validation, repair, and coverage-measurement components; used the extended workflow to identify real-world bugs in deep-learning libraries.

Assessing Code Understandability in Java Decompilation

May 2023 - Jun. 2024

Research Assistant; Advisor: Prof. Minxue Pan, Nanjing University

- Built a SonarQube-based analysis workflow and evaluated source and decompiled Java code across diverse projects and mainstream decompilers, including Jadx, FernFlow, and CFR.
- Trained an n-gram language model, conducted manual assessments using established Java conventions, and identified recurring decompilation patterns that reduce readability.
- Helped design Cognitive Complexity^D, a decompilation-aware metric that more accurately captures understandability differences between source and decompiled code than conventional metrics.

Reinforced-Attention Policy for LibFewShot

Sep. 2023 - Jan. 2024

Research Project

- Implemented a reinforced-attention framework combining few-shot learning with Markov decision processes and adapted the model to limited hardware resources.
- Evaluated multiple backbone networks and meta-learners in LibFewShot, successfully reproducing the reported improvements across varied configurations.

GenDroid: Mobile Test Script Generation from Natural Language

Sep. 2022 - Mar. 2023

Research Assistant; Advisor: Prof. Minxue Pan, Nanjing University

- Combined SentenceBERT features with a random forest classifier to match natural-language test intents to Android UI widgets; contributed path planning over DroidBot-generated UI transfer graphs.
- Identified omitted actions and application-state transitions to make multi-step test execution more robust and reduce cascading failures.
- Helped design and run experiments demonstrating improved intent coverage and widget-matching accuracy across diverse Android applications.

Honors and Awards

Outstanding Paper Award, 18th National College Students Innovation Annual Conference, China	2025
First-Class People’s Scholarship, Nanjing University	2023 - 2025

Technical Skills

Programming: Python, Java, C/C++, Bash, SMV, LaTeX
Frameworks and Tools: PyTorch, Docker, Z3, Semgrep, SonarQube, NuSMV/nuXmv, UPPAAL
Methods: Fuzzing, runtime verification, model checking, static analysis, and machine learning