

CHENGPENG WANG

Assistant Professor, National University of Singapore

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RESEARCH INTEREST

Software Engineering, Programming Languages, and Machine Learning, with a focus on developing program analysis techniques that enhance the reliability and performance of modern software systems, with particular interests in AI-assisted software development and AI agents.

EDUCATION

Hong Kong University of Science and Technology *Aug 2019 - Dec 2023*
Ph.D. in Computer Science and Engineering

Tsinghua University *Aug 2016 - Jul 2019*
M.S. in Software Engineering

Tsinghua University *Aug 2012 - Jul 2016*
B.S. in Software Engineering, Minor in Math

ACADEMIC AND INDUSTRY APPOINTMENTS

NOW | **Assistant Professor, National University of Singapore, Singapore**
JUNE 2026 | School of Computing

MAY 2026 | **Postdoctoral Fellow, Purdue University, West Lafayette, IN, USA**
MAR 2024 | Neuro-symbolic code auditing, working with Prof. Xiangyu Zhang

JULY 2023 | **Research Intern at Veridise, Remote**
MAY 2023 | Static bug detection of zero-knowledge proof circuits

AUG 2022 | **Research Intern at Ant Group, Shenzhen, China**
FEB 2021 | Performance optimization of database-backed application

AUG 2019 | **Research Intern at Sourcebrella, Shenzhen, China**
FEB 2019 | Inconsistency detection of build systems

HONORS AND AWARDS

ASE Distinguished Reviewer Award, ACM SIGSOFT *2025*
NeurIPS Spotlight Paper, NeurIPS *2025*
Postdoc Travel Award, Purdue University *2024*
ACM SIGARCH Best Paper Award, ASPLOS *2024*
UGC Research Travel Grant, HKUST *2022, 2023*
Ant Group Outstanding Collaboration Award *2023*
ACM SIGPLAN Distinguished Paper Award, OOPSLA *2022*

GRANTS

PI. “*Synthesizing Realistic Benchmarks for LLM-Aided Code Auditing*”. Researcher Access Program, funded by **OpenAI**.

Co-Advisor, with Xiangyu Zhang (PI). “*Amazon Trusted AI Challenge: An Agentic Red Teaming Framework for Code LLMs*”. Funded by **Amazon** (acceptance rate: 11%, 10/90).

PUBLICATIONS

JOURNAL PUBLICATIONS

- [J1] Chao Wang, Li Lin, **Chengpeng Wang**, Jiafeng Huang, Congxia Wu, and Rongxin Wu, ReachCheck: Compositional Library-Aware Call Graph Reachability Analysis in the IDEs, In **TOSEM 2025: Transactions on Software Engineering and Methodology**
- [J2] Hao Ling, Heqing Huang, **Chengpeng Wang**, Yuandao Cai, and Charles Zhang, GiantSan: Efficient Operation-Level Memory Sanitization with Segment Folding, In **TOCS 2024: The ACM Transactions on Computer Systems**. (Invited extension of [C16])
- [J3] Rongxin Wu, Zhiling Huang, Zige Tian, **Chengpeng Wang**, and Xiangyu Zhang, PackHunter: Recovering Missing Packages for C/C++ Projects, In **TSE 2024: Transactions on Software Engineering**
- [J4] Yi Sun, **Chengpeng Wang**, Gang Fan, Qingkai Shi, and Xiangyu Zhang, Fast and Precise Static Null Exception Analysis with Synergistic Preprocessing, In **TSE 2024: Transactions on Software Engineering**
- [J5] Wensheng Tang, Dejun Dong, Shijie Li, **Chengpeng Wang**, Peisen Yao, Jinguo Zhou, and Charles Zhang, Octopus: Scaling Value-Flow Analysis via Parallel Collection of Realizable Path Conditions, In **TOSEM 2023: Transactions on Software Engineering and Methodology**
- [J6] **Chengpeng Wang**, Wenyang Wang, Peisen Yao, Qingkai Shi, Jinguo Zhou, Xiao Xiao, and Charles Zhang, Anchor: Fast and Precise Value-Flow Analysis for Containers via Memory Orientation, In **TOSEM 2022: Transactions on Software Engineering and Methodology**

CONFERENCE PUBLICATIONS

- [C1] Yifei Gao, **Chengpeng Wang**, Pengxiang Huang, Xuwei Liu, Mingwei Zheng, and Xiangyu Zhang, Raw Pointer Rewriting with LLMs for Translating C to Safer Rust, In Findings of **ACL 2026: Findings of the Association for Computational Linguistics**.
- [C2] Hanyun Jiang, Peisen Yao, Kaiyue Li, Tingting Lin, **Chengpeng Wang**, and Kui Ren, HintPilot: LLM-based Compiler Hint Synthesis for Code Optimization, In Findings of **ACL 2026: Findings of the Association for Computational Linguistics**.
- [C3] **Chengpeng Wang**, Yifei Gao, Wuqi Zhang, Xuwei Liu, Jinyao Guo, Mingwei Zheng, Qingkai Shi, and Xiangyu Zhang, NESA: Relational Neuro-Symbolic Static Program Analysis, In **FSE 2026: International Conference on the Foundations of Software Engineering**.
- [C4] Ming Liang, Xiaoheng Xie, Gehao Zhang, Xunjin Zheng, Wei Jiang, **Chengpeng Wang**, Gang Fan, and Peng Di, RepoFuse: A Dual-Context Approach to Repository-Level Code Completion at Industrial Scale, In **FSE 2026, Industry Track: International Conference on the Foundations of Software Engineering**.
- [C5] Mingwei Zheng, **Chengpeng Wang**, Xuwei Liu, Jinyao Guo, Shiwei Feng, and Xiangyu Zhang, RFCAudit: AI Agent for Auditing Protocol Implementations Against RFC Specifications, In **ASE 2025: International Conference on Automated Software Engineering**.
- [C6] Danning Xie, Mingwei Zheng, Xuwei Liu, Jiannan Wang, **Chengpeng Wang**, Lin Tan, and Xiangyu Zhang, CORE: Benchmarking LLMs' Code Reasoning Capabilities through Static Analysis Tasks, In **NeurIPS 2025: Annual Conference on Neural Information Processing Systems**. 🏆 [Spotlight Paper](#)
- [C7] Jinyao Guo[#], **Chengpeng Wang**[#], Xiangzhe Xu, Zian Su, and Xiangyu Zhang. RepoAudit: An Autonomous LLM-Agent for Repository-Level Code Auditing. In **ICML 2025: International Conference on Machine Learning**.
- [C8] Yuan Li, Peisen Yao, Kan Yu, **Chengpeng Wang**, Yaoyang Ye, Song Li, Meng Luo, Yepang Liu, and Kui Ren. Understanding Industry Perspectives of Static Application Security Testing Evaluation, In **FSE 2025: International Conference on the Foundations of Software Engineering**.
- [C9] Mingwei Zheng, Danning Xie, Qingkai Shi, **Chengpeng Wang**, and Xiangyu Zhang, Validating Network Protocol

Parsers with Traceable RFC Document Interpretation, In **ISSTA 2025**: International Symposium on Software Testing and Analysis.

[C10] Wei Chen, Bowen Zhang, **Chengpeng Wang**, Wensheng Tang, and Charles Zhang, Seal: Towards Diverse Specification Inference for Linux Interfaces from Security Patches, In **EuroSys 2025**: European Conference on Computer Systems.

[C11] **Chengpeng Wang**, Wuqi Zhang, Zian Su, Xiangzhe Xu, Xiaoheng Xie, and Xiangyu Zhang, LLMDFFA: Analyzing Dataflow in Code with Large Language Models, In **NeurIPS 2024**: Annual Conference on Neural Information Processing Systems

[C12] **Chengpeng Wang**, Wuqi Zhang, Zian Su, Xiangzhe Xu, and Xiangyu Zhang, Sanitizing Large Language Models in Bug Detection with Data-Flow, In Findings of **EMNLP 2024**: Empirical Methods in Natural Language Processing

[C13] Li Lin, Zongyin Hao, **Chengpeng Wang**, Zhuangda Wang, Rongxin Wu, and Gang Fan, SQLess: Dialect-Agnostic SQL Query Simplification, In **ISSTA 2024**: International Symposium on Software Testing and Analysis

[C14] **Chengpeng Wang**, Jipeng Zhang, Rongxin Wu, and Charles Zhang, DAInfer: Inferring API Aliasing Specifications from Library Documentation via Neurosymbolic Optimization, In **FSE 2024**: International Conference on the Foundations of Software Engineering

[C15] Bowen Zhang, Wei Chen, Peisen Yao, **Chengpeng Wang**, Wensheng Tang, and Charles Zhang, SIRO: Empowering Version Compatibility in Intermediate Representations via Program Synthesis, In **ASPLOS 2024**: ACM Conference on Architectural Support for Programming Languages and Operating Systems

[C16] Hao Ling, Heqing Huang, **Chengpeng Wang**, Yuandao Cai, and Charles Zhang, GiantSan: Efficient Memory Sanitization with Segment Folding, In **ASPLOS 2024**: ACM Conference on Architectural Support for Programming Languages and Operating Systems 🏆 **ACM SIGARCH Best Paper Award**

[C17] Rongxin Wu, Yuxuan He, Jiafeng Huang, **Chengpeng Wang**, Wensheng Tang, Qingkai Shi, Xiao Xiao, and Charles Zhang, LibAlchemy: A Two-Layer Persistent Summary Design for Taming Third-Party Libraries in Static Bug-Finding Systems, In **ICSE 2024**: International Conference on Software Engineering

[C18] Wensheng Tang[#], **Chengpeng Wang**[#], Peisen Yao, Rongxin Wu, Xianjin Fu, Gang Fan, and Charles Zhang, DCLink: Bridging Data Constraint Changes and Implementations in FinTech Systems, In **ASE 2023** : International Conference on Automated Software Engineering

[C19] **Chengpeng Wang**, Peisen Yao, Wensheng Tang, Gang Fan, Charles Zhang, Synthesizing Conjunctive Queries for Code Search, In **ECOOP 2023**: European Conference on Object-Oriented Programming

[C20] Zongyin Hao, Quanfeng Huang, **Chengpeng Wang**, Jianfeng Wang, Yushan Zhang, Rongxin Wu, and Charles Zhang, Pinolo: Detecting Logical Bugs in Database Management Systems with Approximate Query Synthesis, In **ATC 2023**: USENIX Annual Technical Conference

[C21] **Chengpeng Wang**, Gang Fan, Peisen Yao, Fuxiong Pan, and Charles Zhang, Verifying Data Constraint Equivalence in FinTech Systems, In **ICSE 2023**: International Conference on Software Engineering

[C22] Rongxin Wu, Minglei Chen, **Chengpeng Wang**, Gang Fan, Jiguang Qiu, and Charles Zhang, Accelerating Build Dependency Error Detection via Virtual Build, In **ASE 2022** : International Conference on Automated Software Engineering

[C23] **Chengpeng Wang**, Peisen Yao, Wensheng Tang, Qingkai Shi, and Charles Zhang: Complexity-Guided Container Replacement Synthesis, In **OOPSLA 2022**: SIGPLAN Conference on Objected Oriented Programming, Systems, Languages and Applications 🏆 **ACM SIGPLAN Distinguished Paper Award**

[C24] Gang Fan, **Chengpeng Wang**, Rongxin Wu, Xiao Xiao, Qingkai Shi, and Charles Zhang: Escaping Dependency Hell: Finding Build Dependency Errors with the Unified Dependency Graph, In **ISSTA 2020**: International Symposium on Software Testing and Analysis

WORKSHOP and POSTER PUBLICATIONS

[W1] Ming Liang, Xiaoheng Xie, Gehao Zhang, Xunjin Zheng, Peng Di, Wei Jiang, Hongwei Chen, **Chengpeng Wang**, and Gang Fan, RepoGenix: Dual Context-Aided Repository-Level Code Completion with Language Models, In Poster Track, **ASE 2024**: International Conference on Automated Software Engineering

[W2] **Chengpeng Wang**, CodeSpider: Automatic Code Querying with Multi-modal Conjunctive Query Synthesis, In SRC track, **SPLASH 2022**: SIGPLAN conference on Systems, Programming, Languages, and Applications: Software for Humanity, Student Research Competition

[W3] **Chengpeng Wang**, Yixiao Yang, Han Liu, and Le Kang: Statistical API Completion Based on Code Relevance Mining, In **MAINT 2019**: International Workshop on Mining and Analyzing Interaction Histories

ACADEMIC SERVICES

Organizing Committee Member:

International Conference on the Foundations of Software Engineering (FSE), Student Research Competition (SRC) 2027
International Workshop on Language Models and Programming Languages (LMPL) 2025

Program Committee Member:

ACM SIGPLAN Conference on Object-Oriented Programming, Systems, Languages, and Applications (OOPSLA) 2027
International Workshop on Language Models and Programming Languages (LMPL) 2026
International Workshop on Principles of Agentic Engineering (PAgE) 2026
International Conference on the Foundations of Software Engineering (FSE) 2025, 2026, 2027
International Conference on Software Engineering (ICSE) 2027
Annual Conference on Neural Information Processing Systems (NeurIPS) 2025, 2026
ACL Rolling Review (ARR) 2026
ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI) 2026
International Symposium on Software Testing and Analysis (ISSTA) 2025, 2026
International Workshop on Large Language Models for Code (LLM4Code) 2026
International Conference on Automated Software Engineering (ASE) 2025
International Conference on AI Foundation Models and Software Engineering (Forge) 2024, 2025
SPLASH, Student Research Contest Track 2024
International Conference on Automated Software Engineering (ASE), Industrial Track 2024
International Symposium on Software Reliability Engineering (ISSRE) 2024, 2025

Journal Reviewer:

Transactions on Software Engineering and Methodology (TOSEM) 2025
Transactions on Software Engineering (TSE) 2024
Communications of the ACM (CACM) 2026

Artifact Evaluation Committee Member:

International Conference on OOP, Systems, Languages, and Applications (OOPSLA) 2024
ACM SIGPLAN Conference on Programming Language Design and Implementation (PLDI) 2023
International Conference on the Foundations of Software Engineering (FSE) 2022
International Symposium on Software Testing and Analysis (ISSTA) 2022

Volunteer:

International Conference on OOP, Systems, Languages, and Applications (OOPSLA) 2022
Student Volunteer at International Symposium on Software Testing and Analysis (ISSTA) 2019
Long-term mentor of [SIGPLAN-M](#) 2024, 2025, 2026

TEACHING

CS 6215: Advanced Topics in Program Analysis, NUS Fall 2026
CS 510: Software Engineering, Purdue University Fall 2025
CS 592: AI and Security, Purdue University Fall 2024
COMP 3021: Java Programming, HKUST Spring/Fall 2022/2023
COMP 4631: Computer and Communication Security, HKUST Fall 2021

COMP 3111/H: Software Engineering, HKUST
COMP 2011: Programming with C++, HKUST
Haskell: Functional Language Programming, THU
Automaton and Formal Logic, THU

Fall 2020
Spring 2020
Spring 2019
Fall 2018

PRESENTATIONS AND INVITED TALKS

Neuro-Symbolic Code Auditing for Software Reliability in the AI Era National University of Singapore, Singapore Management University	Dec 2025
Static Code Auditing for Software Quality Assurance in the AI Era Tufts University, Boston	Oct 2025
RepoAudit: Human-like AI Auditor for Code Repositories RSA Conference 2025, San Francisco	Apr 2025
Advances in AI-powered Code Security: Next-Level Bug Detection Uber's Programming Systems Team. Virtual CodeQL@GitHub . Virtual	Feb 2025 Jan 2025
Neuro-Symbolic Static Analysis for Reliable Software Systems University of British Columbia, Columbia University UC Davis, UIUC, UNSW AST Lab, ETH Zurich. Virtual Department of Computing, Hong Kong Polytechnic University Institute of Data Science, The University of Hong Kong	Aug 2025 May 2025 Mar 2025 Jan 2025 Dec 2024
Neuro-Symbolic Static Analysis for Reliable and Performant Software Systems School of Computer Science, Nanjing University. Nanjing, China	Dec 2024
When Static Analysis Meets Large Language Models: A Neuro-Symbolic Approach Ant Group. Virtual Boston Computation Club . Virtual AI-CyberSecurity Research Lunch Talk, Texas A&M University (TAMU). Virtual School of Software, Tsinghua University. Virtual	Dec 2024 Nov 2024 Oct 2024 Oct 2024
Towards Enhancing Reliability and Performance of Data-Centric Systems with Static Analysis School of Informatics, Xiamen University. Xiamen, China	Aug 2023
Synthesizing Conjunctive Queries for Code Search ByteDance. Virtual	Jun 2023
Complexity-Guided Container Replacement Synthesis AST Lab, ETH Zurich. Virtual	Mar 2023