

MINGWEI ZHENG

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EDUCATION

Purdue University

Ph.D. candidate in Computer Science, advised by Prof. Xiangyu Zhang
- Research Area: Software Engineering and Programming Languages

West Lafayette, IN
Aug. 2021 - May 2026 (expected)

Huazhong University of Science and Technology

B.E. in Computer Science and Technology, Outstanding Graduate

Wuhan, China
Aug. 2016 - Jun. 2020

RESEARCH INTEREST

My research focuses on building automated techniques that combine program analysis, formal methods, and large language models (LLMs) to improve the correctness, robustness, and trustworthiness of software systems.

PUBLICATIONS

(* indicates equal contribution)

[1] Validating Network Protocol Parsers with Traceable RFC Document Interpretation

Mingwei Zheng, Danning Xie, Qingkai Shi, Chengpeng Wang, Xiangyu Zhang
The ACM SIGSOFT International Symposium on Software Testing and Analysis (ISSTA 2025)

[2] Large Language Models for Validating Network Protocol Parsers

Mingwei Zheng, Danning Xie, Xiangyu Zhang
The Eleventh Workshop on Language-Theoretic Security at the IEEE Security & Privacy (LangSec 2025)

[3] ParDiff: Practical Static Differential Analysis of Network Protocol Parsers

Mingwei Zheng, Qingkai Shi, Xuwei Liu, Xiangzhe Xu, Le Yu, Congyu Liu, Guannan Wei, Xiangyu Zhang
The ACM SIGPLAN Conference on Object Oriented Programming, Systems, Languages, and Applications (OOPSLA 2024), **ACM SIGPLAN Distinguished Paper Award (7 out of 148 accepted papers)**

[4] Lifting Network Protocol Implementation to Precise Format Specification with Security Applications

Qingkai Shi, Junyang Shao, Yapeng Ye, **Mingwei Zheng**, Xiangyu Zhang
The ACM Conference on Computer and Communications Security (CCS 2023)

[5] Why Do Developers Remove Lambda Expressions in Java?

Mingwei Zheng, Jun Yang, Ming Wen, Hengcheng Zhu, Yepang Liu, Hai Jin
The IEEE/ACM International Conference on Automated Software Engineering (ASE 2021)

[6] An LLM Agent for Functional Bug Detection in Network Protocols

Mingwei Zheng, Chengpeng Wang, Xuwei Liu, Jinyao Guo, Shiwei Feng, Xiangyu Zhang
Under Submission, arXiv:2506.00714 (2025)

[7] CORE: Benchmarking LLMs' Code Reasoning Capabilities through Static Analysis Tasks

Danning Xie*, **Mingwei Zheng***, Xuwei Liu, Jiannan Wang, Chengpeng Wang, Lin Tan, Xiangyu Zhang
Under Submission, arXiv:2507.05269 (2025)

[8] SFA-Miner: Mining Path-Sensitive API Usage Patterns via Symbolic Finite Automata

Jiasheng Jiang, **Mingwei Zheng**, Qingkai Shi, Xiangyu Zhang
Under Submission (2025)

[9] IntenTest: Stress Testing for Intent Integrity in API-Calling LLM Agents

Shiwei Feng, Xiangzhe Xu, Xuan Chen, Kaiyuan Zhang, Syed Yusuf Ahmed, Zian Su, **Mingwei Zheng**, Xiangyu

Zhang

Under Submission, arXiv:2506.07524 (2025)

[10] PR²: Peephole Raw Pointer Rewriting with LLMs for Translating C to Safer Rust

Yifei Gao, Chengpeng Wang, Pengxiang Huang, Xuwei Liu, **Mingwei Zheng**, Xiangyu Zhang

Under Submission, arXiv:2505.04852 (2025)

[11] Relational Neuro-Symbolic Static Program Analysis

Chengpeng Wang, Yifei Gao, Wuqi Zhang, Xuwei Liu, Jinyao Guo, **Mingwei Zheng**, Qingkai Shi, Xiangyu Zhang

Under Submission (2025)

[12] A Foundation Model for Behavior Abstraction in Audit Logs

Zhou Xuan, Xiangzhe Xu, Le Yu, **Mingwei Zheng**, Chanwoo Bae, Zhuo Zhang, Yousra Aafer, Xiangyu Zhang

Under Submission (2025)

WORK EXPERIENCES

Amazon, Q Developer

Applied science intern, mentored by Mukherjee, Rajdeep

Santa Clara, CA

Aug. 2025 - Nov. 2025

Microsoft Research, RiSE Group

Research intern, mentored by Sarah Fakhoury, Nikhil Swamy

- Project: LLMs for Semantic-Aware Testing

Redmond, WA

May 2025 - Aug. 2025

Microsoft Research, RiSE Group

Research intern, mentored by Tahina Ramananandro, Sarah Fakhoury, Nikhil Swamy

- Project: Securing Binary Format Parsing with AI

Redmond, WA

May 2024 - Dec. 2024

AWARDS

ACM SIGPLAN Distinguished Paper Award, OOPSLA 2024

Outstanding Graduate, Huazhong University of Science and Technology, 2020

ACADEMIC SERVICE

Program Committee, EXPRESS (ISSTA Workshop), 2025

Journal Reviewer, IEEE Internet of Things Journal, 2023-2024

Journal Reviewer, High-Confidence Computing, 2023-2024

Journal Reviewer, IEEE Transactions on Wireless Communications, 2023

Journal Reviewer, Computer Networks, 2024

Journal Reviewer, PeerJ Computer Science, 2023-2025

INVITED TALKS

An LLM Agent for Functional Bug Detection in Network Protocols

Boston Computation Club, Aug. 2025

ParDiff: Practical Static Differential Analysis of Network Protocol Parsers

UIUC, Nov. 2024

Static Analysis for Network Protocol Parsers

LangSec Workshop, May 2024

TEACHING

Teaching Assistant, CS 18000: Problem Solving and Object-Oriented Programming *Purdue University, Spring 2022*

Teaching Assistant, CS 30700: Software Engineering

Purdue University, Fall 2022