

# MINGWEI ZHENG

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## EDUCATION

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### Purdue University

West Lafayette, IN

Ph.D. candidate in Computer Science, advised by Prof. Xiangyu Zhang

Aug. 2021 - May 2026 (expected)

- Research Area: Software Engineering and Programming Languages

### Huazhong University of Science and Technology

Wuhan, China

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

Aug. 2016 - Jun. 2020

## RESEARCH INTEREST

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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

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(\* 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] PR<sup>2</sup>: 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

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**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*

**Redmond, WA**

*May 2025 - Aug. 2025*

- Project: Detecting Indent Mismatch through Deep Codebase Understanding

**Microsoft Research, RiSE Group**

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

**Redmond, WA**

*May 2024 - Dec. 2024*

- Project: Securing Binary Format Parsing with AI

## AWARDS

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ACM SIGPLAN Distinguished Paper Award, OOPSLA 2024

Outstanding Graduate, Huazhong University of Science and Technology, 2020

## ACADEMIC SERVICE

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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

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ParDiff: Practical Static Differential Analysis of Network Protocol Parsers

*UIUC, Nov. 2024*

Static Analysis for Network Protocol Parsers

*LangSec Workshop, May 2024*

An LLM Agent for Functional Bug Detection in Network Protocols

*Boston Computation Club, Aug. 2025*

## TEACHING

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

Teaching Assistant, CS 30700: Software Engineering

*Purdue University, Fall 2022*