Congying Xu (PhD Student)

🏛 The Hong Kong University of Science and Technology

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🔍 Research Interests: **AI for Software Engineering**, **Trustworthy AI Systems**

🎓 Education

PhD Candidate@Hong Kong University of Science and Technology   2022.09 – 2026
- Research Topic: LLM-Empowered Software Engineering
- Advisor: Shing-Chi Cheung (Chair Professor, IEEE Fellow)

Visiting Scholar@Carnegie Mellon University   2025.01 – 2025.06
- Research Topic: LLM Agent Engineering
- Advisor: Christian Kästner (Associate Professor)

Master Degree@Fudan University   2019.09 – 2022.06
- Research Topic: Software Supply Chain Security
- Advisors: Bihuan Chen (Associate Professor) and Xin Peng (Professor)

Bachelor Degree@Yangzhou University   2015.09 – 2019.06
- Major: Internet of Things Engineering
- Rank: 1/48, Advisor: Xiaobing Sun (Professor)

📑 Research Experience & Publications

LLM Agent Safety

[1] **[Under Review] Towards Verifiably Safe Tool Use for LLM Agents**

Aarya Doshi, Yining Hong, **Congying Xu**, Eunsuk Kang, Alexandros Kapravelos, Christian Kästner   CCF-A

LLM-Empowered Software Testing

[2] **[Under Review] MR-Coupler: Automated Metamorphic Test Generation via Functional Coupling Analysis**

Congying Xu, Songqiang Chen, Hengcheng Zhu, Jiarong Wu, Valerio Terragni, Shing-Chi Cheung   CCF-A

[3] **[ASE 2024] MR-Adopt: Automatic Deduction of Input Transformation Function for Metamorphic Testing.**

Congying Xu, Songqiang Chen, Jiarong Wu, Shing-Chi Cheung, Valerio Terragni, Hengcheng Zhu, Jialun Cao   CCF-A

[4] **[TOSEM 2024] MR-Scout: Automated Synthesis of Metamorphic Relations from Existing Test Cases.**

Congying Xu, Valerio Terragni, Hengcheng Zhu, Jiarong Wu, Shing-Chi Cheung   CCF-A

LLM-Empowered Code Translation and Generation

[5] **[Under Review] On Effective Semantic Translation for Code: A Study Based on Pseudocode**

Songqiang Chen, **Congying Xu**, Jingyi Chen, Jialun Cao, Jiarong Wu, Shing-Chi Cheung CCF-A

[6] **[TSE 2025] Question Selection for Multi-Modal Code Search Synthesis using Probabilistic Version Spaces**

Jiarong Wu, Yanyan Jiang, Lili Wei, **Congying Xu**, Shing-Chi Cheung, Chang Xu   CCF-A

Software Supply Chain Security

[7] **[ESEC/FSE 2022] Tracking Patches for Open Source Software Vulnerabilities.**
Congying Xu, Bihuan Chen, Chenhao Lu, Kaifeng Huang, Xin Peng, Yang Liu   CCF-A

[8] **[EMSE 2022] Characterizing usages, updates and risks of third-party libraries in Java projects.**
Kaifeng Huang, Bihuan Chen, **Congying Xu**, Ying Wang, Bowen Shi, Xin Peng, Yijian Wu, Yang Liu   CCF-B

[9] **[ICSME 2020] An Empirical Study of Usages, Updates and Risks of Third-Party Libraries in Java Projects. (🏆 IEEE TCSE Distinguished Paper Award)**
Ying Wang, Bihuan Chen, Kaifeng Huang, Bowen Shi, **Congying Xu**, Xin Peng, Yijian Wu, Yang Liu   CCF-B

[10] **[ESEC/FSE 2020] Interactive, Effort-aware Library Version Harmonization.**
Kaifeng Huang, Bihuan Chen, Bowen Shi, Ying Wang, **Congying Xu**, Xin Peng   CCF-A

Recommendation System

[11] **[ICSE 2019] MULAPI: A Tool for API Method and Usage Location Recommendation. (Tool Demo)**
Congying Xu, Bosen Min, Xiaobing Sun, Jiajun Hu, Bin Li, Yucong Duan   CCF-A

[12] **[JSS 2018] MULAPI: Improving API method recommendation with API usage location.**
Congying Xu, Xiaobing Sun, Bin Li, Xintong Lu, Hongjing Guo   CCF-B

👥 Academic Service

- Reviewer: TOSEM 2025, ASEJ 2025, AE@ISSRE 2024, AE@ISSRE 2023
- Co-Reviewer: FSE 2025, ASE 2025, ISSTA 2025
- Volunteer: FSE 2025, ASE 2021

📘 Teaching Experience

- COMP4633 Competitive Programming in Cybersecurity   Fall 2025–26
- COMP3021 Java Programming   Fall 2024–25
- COMP1021 Introduction to Computer Science (Python Programming)   Fall 2023-24

🏆 Selected Awards

- Overseas Research Award, HKUST   2024 – 2025
- Postgraduate Studentship (PGS), HKUST   2022 – Present
- National Scholarship, Ministry of Education of China   2019
- Outstanding Graduates of Yangzhou University   2019
- First Prize · Blue Bridge Cup National Programming Competition, Jiangsu (Java)   2018
- First Prize · Chemistry Olympiad Contest, Jiangsu Province   2014