HAOYU GAO

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RESEARCH INTEREST

My research intersects empirical and automated software engineering, focusing on improving how developers create, maintain, and use software documentation. I study documentation as a socio-technical artefact, combining repository mining, qualitative methods, and machine learning to analyse both technical content and human practices. With the rise of LLMs, my work is pivoting towards human–AI interaction, specifically examining how development knowledge is communicated to AI agents. I am particularly interested in agent configuration file as a medium for encoding developer intent, context, and process knowledge to support trustworthy and effective human–AI collaboration.

EDUCATION

The University of Melbourne *Jan 2023 - Nov 2026 (Expected)*
Doctor of Philosophy - Engineering and IT
Supervisors: A/Prof. Christoph Treude and Dr. Mansooreh Zahedi
Research Topic: *Mitigating Knowledge Barriers in Traditional and AI-Based Software Development.*

The University of Melbourne *Feb 2021 - Dec 2022*
Master of Information Technology WAM: 86.7/100

Fuzhou University *Sep 2016 - July 2020*
Bachelor of Science - Mathematics and Applied Mathematics WAM: 86.6/100

PUBLICATIONS

[TSE'25] **H. Gao**, C. Treude, and M. Zahedi. Adapting Installation Instructions in Rapidly Evolving Software Ecosystems: In IEEE Transactions on Software Engineering, 2025. **(core A*)**

[FSE'23] **H. Gao**, C. Treude, and M. Zahedi. "Evaluating Transfer Learning for Simplifying GitHub READMEs". In *ESEC/FSE'23: Proceedings of the Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering, 2023.* **(core A*)**

[ESEM'24] **H. Gao**, M. Zahedi, C. Treude, S. Ronsenstock, and M. Cheong. "Documenting Ethical Considerations in Open Source AI Models". In *ESEM'24: 18th International Symposium on Empirical Software Engineering and Measurement*, 2024. **(core A)**

[ACL'25 findings] H. Lin, C. Liu, **H. Gao**, P. Thongtanunam, and C. Treude. CodeReviewQA: The Code Review Comprehension Assessment for Large Language Models. In *Findings of ACL'25*: The 63rd Annual Meeting of the Association for Computational Linguistics **(core A*)**

[ICSME'25] P. Banyongrakkul, M. Zahedi, P. Thongtanunam, C. Treude, and **H. Gao**. From Release to Adoption: Challenges in Reusing Pre-trained AI Models for Downstream Developers. In *ICSME'25: 41st International Conference on Software Maintenance and Evolution* **(core A)**

[MSR'26 short] **H. Gao**, P. Banyongrakkul, H. Guan, M. Zahedi, C. Treude, "On Autopilot? An Empirical Study of Human-AI Teaming and Review Practices in Open Source". *Short Paper* in *MSR'26: 23rd International Conference on Mining Software Repositories*, 2026, **(core A)**

H.Gao, M. Zahedi, W. Jiang, H. Lin, J. Davis, and C. Treude. AI Safety in the Eyes of the Downstream Developer: A First Look at Concerns, Practices, and Challenges. **(Major revision under EMSE)**

H. Gao, H. Lin, C. Treude, G. Gay, and M. Zahedi. Does My README File Need To Be Updated? Exploring LLM-Based README Maintenance. (**Major revision under TSE)**

H. Lin, C. Liu, **H. Gao**, P. Thongtanunam, and C. Treude. Fine-grained Approaches for Confidence Calibration of LLMs in Automated Code Revision. **(Major revision under TSE)**

P. Banyongrakkul, M. Zahedi, C. Treude, **H. Gao** and P. Thongtanunam. When AI Models Become Dependencies: Studying the Evolution of Pre-Trained Model Reuse in Downstream Software Systems. (**Under submission**)

L. Salerno, **H. Gao**, P. Thongtanunam, C. Treude. ChatGPT as an Installation Assistant: How Novices Use LLMs for Software Tool Installation. **(Under submission)**

EXPERIENCE

Visiting Postgraduate Research Student, Singapore Management University *Sep 2025- Feb 2026*

Visiting Professors: A/Prof. Christoph Treude

Teaching Assistant, The University of Melbourne *Oct 2023- Present*

Tutored Courses:

- COMP90041 Programming and Software Development
- SWEN90017 Masters Advanced Software Project

Marked Courses:

- COMP90041 Programming and Software Development
- SWEN90016 Software Processes and Management
- COMP90049 Introduction to Machine Learning
- COMP90051 Statistical Machine Learning

Skills: Java Programming Language, Object-Oriented Programming, Software Development Processes, Agile Development, Machine Learning, University Teaching.

Research Assistant, The University of Melbourne *Dec 2023- May 2024*
Skills: Mining software repositories, Qualitative analysis, Ethics in Machine Learning

Machine Learning Internship, Haier Group Corporation *Oct 2021- Feb 2022*
Skills: Machine Learning, Data analysis

SERVICES AND ACTIVITIES

Journal Review

- Empirical Software Engineering Journal.
- Automated Software Engineering Journal.

Conference Review

- PC member for ICSME'26 Demo and Data Showcase Track.
- PC member for ICSE'26 Artifact Evaluation Track.
- Junior PC member for MSR'25.

Sub-reviewer
TOSEM, ICSE'25, ESEM'24, APSEC'24.

Student Volunteer
Event: ICSE 2023 - International Conference on Software Engineering
Skills: registration assistance and presentation session support.

(CO)-SUPERVISED STUDENTS

Hao Guan - Master of Software Engineering, The University of Melbourne

SKILLS

Programming
Python, Java, JavaScript, R.

Research
Data mining, Interview-based study, Qualitative analysis, Machine learning, HPC cluster.

Languages
Mandarin (Native), English (Full professional proficiency).

AWARDS AND SCHOLARSHIPS

2022 Dean's Honours List, The University of Melbourne *July 2023*
The Dean's Honours List recognises outstanding academic performance in the academic year, representing the top five per cent of students enrolled in an engineering or information technology master by coursework program.

Melbourne Research Scholarship, The University of Melbourne *Jan 2023*
This scholarship is rewarded to high-achieving students participating in research activities.

Melbourne Graduate Scholarship, The University of Melbourne *Jan 2022*
This scholarship is rewarded to coursework students in recognition of their academic achievements.