

# Mingwei LIU

## Curriculum Vitae



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## Self Introduction

Dr. Mingwei Liu is a Postdoctoral Fellow at Fudan University, China. He received his Ph.D. and B.E degrees in Software Engineering from Fudan University in 2022 and 2017, under the supervision of Prof. Xin Peng. His research focuses on the intersection of Software Engineering (SE) and Artificial Intelligence (AI), specifically in the domains of AI4SE and SE4AI. Dr. Liu's primary interest lies in leveraging advanced AI technologies, such as large language models and knowledge graphs, to address software engineering challenges and tackle the software engineering and system engineering problems prevalent in AI applications and scenarios.

## Education

- 2017–2022 : **PhD, Software Engineering**, *School of Computer Science, Fudan University*, Shanghai, China.
- 2013–2017 : **Bachelor of Engineering, Software Engineering**, *Software School, Fudan University*, Shanghai, China.

## Research Experience

[Fudan University Software Engineering Laboratory, Postdoctoral Fellow](#)

- June, 2022 – present ***Intelligent Software Development based on Large Language Models.***  
Leveraging the capabilities of large language models (e.g., ChatGPT, LLaMa, StarCoder, CodeT5, CodeGen) to enhance various aspects of software development, including code generation, bug detection and fixing, natural language understanding in software engineering, and automated software testing.
- June, 2022 – present ***Intelligent Construction and Evolution of AI Applications.***  
Intelligent support for the development and evolution of AI applications, with a particular focus on generative AI-based applications.

[Fudan University Software Engineering Laboratory, Doctoral Student](#)

- July, 2018 – July, 2022 ***Automatic Question Answering Based on Software Development Knowledge Graph.***  
Building a software development knowledge graph by analyzing different sources such as API documentation and technical Q&A sites, and implementing automatic question answering based on the knowledge graph.
- Advisor : **Professor Xin Peng**, *Deputy Dean School of Computer Science, Fudan University, China*, ([Homepage](#))

## Honors and Awards

- 2022 **Outstanding Graduates of Ordinary Universities**, Shanghai
- 2022 **Super Postdoctoral Fellowship Program**, Shanghai
- 2021 **Qiming Xingchen Scholarship**, Fudan University
- 2019 **Huawei Weirui Scholarship**, Fudan University
- 2018 **IEEE TCSE Distinguished Paper Awards (ICSME 2018)**

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## Project Experience

- 2022-2024 Ministry of Science and Technology's key research and development project of China (2021ZD0112903), Construction and Evolution Techniques of Complex Intelligent Software Systems based on Human-Machine Collaboration, Main Participant
- 2020-2023 National Natural Science Foundation of China (Grant No. 61972098.), Software Development Q&A and Resource Recommendations based on API Knowledge, Main Participant
- 2023 Enterprise Collaboration Project (Huawei), Code Recommendation, Main Leader
- 2023 Enterprise Collaboration Project (Tencent), Code Pre-trained Model Data Quality Assurance Project, Main Leader
- 2022 Enterprise Collaboration Project (Huawei), Intelligent Assisted Programming II, Main Leader
- 2022 Enterprise Collaboration Project (Honor), Code Knowledge Graph and Intelligent Assistance, Main Leader
- 2020 Enterprise Collaboration Project (Huawei), Intelligent Assisted Programming I, Main Leader
- 2019 Enterprise Collaboration Project (Huawei), Intelligent YAML Interface Recommendation, Main Leader

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## Publications

### Articles in Refereed Journals

**Top journal statistics: TSE (2), TOSEM (1); 1st author (2)**

- [J5]-2023 **Mingwei Liu**, Chengyuan Zhao, Xin Peng, Simin Yu, Haofen Wang, and Chaofeng Sha. Task-oriented ML/DL Library Recommendation based on a Knowledge Graph. IEEE Transactions on Software Engineering (TSE 2023), to appear, 2023
- [J4]-2023 Chong Wang, Xin Peng, Zhenchang Xing, Yue Zhang, **Mingwei Liu**, Rong Luo, and Xiujie Meng. Xcos: Explainable Code Search based on Query Scoping and Knowledge Graph. ACM Transactions on Software Engineering and Methodology (TOSEM 2023), to appear, 2023
- [J3]-2022 Xueying Du, **Mingwei Liu\***, Liwei Shen, and Xin Peng. Research on Knowledge Graph Representation Learning Methods for Link Prediction: A Review. Journal of Software (JOS 2023), to appear, 2023
- [J2]-2022 **Mingwei Liu**, Xin Peng, Andrian Marcus, Shuangshuang Xing, Christoph Treude, and Chengyuan Zhao. API-related Developer Information Needs in Stack Overflow. IEEE Transactions on Software Engineering (TSE 2022), volume 48, pages 4485–4500, 2022.
- [J1]-2021 Shuangshuang Xing, **Mingwei Liu**, and Xin Peng. Automatic Code Semantic Tag Generation Approach based on Software Knowledge Graph. Journal of Software (JOS 2021), volume 33, pages 4027–4045, 2021

### Refereed Conference Publications

**Top conference statistics: FSE (7), ASE (2), ICSME (2); 1st author (6), corresponding author (1)**

- [C15]-2023 **Mingwei Liu**, Tianyong Yang, Yiling Lou, Xueying Du, Ying Wang, and Xin Peng. CodeGen4Libs: A Two-stage Approach for Library-oriented Code Generation. In Proceedings of the 38th IEEE/ACM International Conference on Automated Software Engineering (ASE 2023), to appear, September 2023
- [C14]-2023 **Mingwei Liu**, Yanjun Yang, Yiling Lou, Xin Peng, Zhong Zhou, Xueying Du, and Tianyong Yang. Recommending Analogical APIs via Knowledge Graph Embedding. In Proceedings of the 31th ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE 2023), to appear, December 2023.

- [C13]-2023 Xueying Du, Yiling Lou, **Mingwei Liu\***, Xin Peng, and Tianyong Yang. KG4CraSolver: Recommending Crash Solutions via Knowledge Graph. In Proceedings of the 31th ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE 2023), to appear, December 2023.
- [C13]-2023 **Mingwei Liu**, Simin Yu, Xin Peng, Xueying Du, Tianyong Yang, Huanjun Xu, and Gaoyang Zhang. Knowledge Graph based Explainable Question Retrieval for Programming Tasks. In Proceedings of the 39th IEEE International Conference on Software Maintenance and Evolution (ICSME 2023), to appear, October 2023.
- [C11]-2022 **Mingwei Liu**, Xin Peng, Andrian Marcus, Christoph Treude, Jiazhan Xie, Huanjun Xu, and Yanjun Yang. How to Formulate Specific How-to Questions in Software Development? In Proceedings of the 30th ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE 2022), Singapore, Singapore, November 14-18, 2022, pages 306–318. ACM, 2022
- [C10]-2021 **Mingwei Liu**, Xin Peng, Andrian Marcus, Christoph Treude, Xuefang Bai, Gang Lyu, Jiazhan Xie, and Xiaoxin Zhang. Learning-based Extraction of First-order Logic Representations of API Directives. In Proceedings of the 29th ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE 2021), Athens, Greece, August 23-28, 2021, pages 491–502. ACM, 2021.
- [C9]-2020 Wenkai Xie, Xin Peng, **Mingwei Liu**, Christoph Treude, Zhenchang Xing, Xiaoxin Zhang, and Wenyun Zhao. API Method Recommendation via Explicit Matching of Functionality Verb Phrases. In Proceedings of the 28th ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE 2020), Virtual Event, USA, November 8-13, 2020, pages 1015–1026. ACM, 2020.
- [C8]-2020 **Mingwei Liu**, Yanjun Yang, Xin Peng, Chong Wang, Chengyuan Zhao, Xin Wang, and Shuangshuang Xing. Learning based and Context Aware Non-informative Comment Detection. In Proceedings of the 36th IEEE International Conference on Software Maintenance and Evolution (ICSME 2020), Adelaide, Australia, September 28 - October 2, 2020, pages 866–867. IEEE, 2020.
- [C7]-2020 **Mingwei Liu**, Xin Peng, Xiujie Meng, Huanjun Xu, Shuangshuang Xing, Xin Wang, Yang Liu, and Gang Lv. Source Code based On-demand Class Documentation Generation. In Proceedings of the 36th IEEE International Conference on Software Maintenance and Evolution (ICSME 2020), Adelaide, Australia, September 28 - October 2, 2020, pages 864–865. IEEE, 2020.
- [C6]-2020 Yang Liu, **Mingwei Liu**, Xin Peng, Christoph Treude, Zhenchang Xing, and Xiaoxin Zhang. Generating Concept based API Element Comparison Using a Knowledge Graph. In 35th IEEE/ACM International Conference on Automated Software Engineering (ASE 2020), Melbourne, Australia, September 21-25, 2020, pages 834–845. IEEE, 2020.
- [C5]-2019 Chong Wang, Xin Peng, **Mingwei Liu**, Zhenchang Xing, Xuefang Bai, Bing Xie, and Tuo Wang. A Learning-based Approach for Automatic Construction of Domain Glossary from Source Code and Documentation. In Proceedings of the 27th ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE 2019), Tallinn, Estonia, August 26-30, 2019, pages 97–108. ACM, 2019
- [C4]-2019 **Mingwei Liu**, Xin Peng, Andrian Marcus, Zhenchang Xing, Wenkai Xie, Shuangshuang Xing, and Yang Liu. Generating Query-specific Class API Summaries. In Proceedings of the 27th ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE 2019), Tallinn, Estonia, August 26-30, 2019, pages 120–130. ACM, 2019.

- [C3]-2018 Hongwei Li, Sirui Li, Jiamou Sun, Zhenchang Xing, Xin Peng, **Mingwei Liu**, and Xuejiao Zhao. Improving API Caveats Accessibility by Mining API Caveats Knowledge Graph. In Proceedings of the 34th IEEE International Conference on Software Maintenance and Evolution (ICSME 2018), Madrid, Spain, September 23-29, 2018, pages 183–193. IEEE Computer Society, 2018. **IEEE TCSE Distinguished Paper Awards.**
- [C2]-2018 **Mingwei Liu**, Xin Peng, Qingtao Jiang, Andrian Marcus, Junwen Yang, and Wenyun Zhao. Searching StackOverflow Questions with Multi-faceted Categorization. In Proceedings of the 10th Asia-Pacific Symposium on Internetware, Internetware 2018, Beijing, China, September 16-16, 2018, pages 10:1–10:10. ACM, 2018.
- [C1]-2018 Xin Peng, Yifan Zhao, **Mingwei Liu**, Fengyi Zhang, Yang Liu, Xin Wang, and Zhenchang Xing. Automatic Generation of API Documentations for Open-source Projects. In IEEE 3rd International Workshop on Dynamic Software Documentation, DySDoc@ICSME 2018, Madrid, Spain, September 25, 2018, pages 7–8. IEEE, 2018.
- Submitted Xueying Du, **Mingwei Liu**, Yiling Lou, Juntao Li, Hanlin Wang and Xin Peng. Investigating ChatGPT’s Capability in Diagnosing Crash Bugs. In Submitted to ICSE 2023.
- Submitted Zhiqiang Yuan, Yiling Lou, **Mingwei Liu**, Shiji Ding, Kaixin Wang, Yixuan Chen and Xin Peng. No More Manual Tests? Evaluating and Improving ChatGPT for Unit Test Generation. In Submitted to ICSE 2023.
- Submitted Xueying Du, **Mingwei Liu\***, Kaixin Wang, Hanlin Wang, Junwei Liu, Yixuan Chen, Jiayi Feng, Chaofeng Sha, Xin Peng, Yiling Lou. ClassEval: A Manually-Crafted Benchmark for Evaluating LLMs on Class-level Code Generation. In Submitted to ICSE 2023.
- Submitted Zhiqiang Yuan, Junwei Liu, Qiancheng Zi, **Mingwei Liu**, Xin Peng, Yiling Lou. Evaluating Instruction-Tuned Large Language Models on Code Comprehension and Generation. In Submitted to ICSE 2023.

## Professional Service (Journals)

- Reviewer IEEE Transaction on Software Engineering (TSE)
- Reviewer IEEE Transaction on Software Engineering and Methodology (TOSEM)
- Reviewer Empirical Software Engineering (ESEM)
- Reviewer Journal of Software: Evolution and Process (JSEP)
- Reviewer Journal of Systems and Software (JSS)
- Reviewer Information and Software Technology (IST)
- Reviewer Automated Software Engineering (ASE)

## Professional Service (Conferences)

- PC Member 31th IEEE International Conference on Software Analysis, Evolution and Reengineering, Tools Demo Track (SANER 2024 Tools Demo)
- Co-Reviewer 45th ACM/IEEE International Conference on Software Engineering (ICSE 2022)
- Co-Reviewer 30th IEEE/ACM International Conference on Program Comprehension (ICPC 2022)
- Co-Reviewer 30th International Symposium on the Foundations of Software Engineering (FSE 2022)
- Co-Reviewer 44th ACM/IEEE International Conference on Software Engineering (ICSE 2021)
- Co-Reviewer 32nd IEEE International Symposium on Software Reliability Engineering (ISSRE 2021)
- Co-Reviewer 29th International Symposium on the Foundations of Software Engineering (FSE 2021)
- Co-Reviewer 27th IEEE International Conference on Software Analysis, Evolution and Reengineering (SANER 2020)
- Co-Reviewer 28th IEEE/ACM International Conference on Program Comprehension (ICPC 2020)
- Co-Reviewer 28th International Symposium on the Foundations of Software Engineering (FSE 2020)

- Volunteer 1st International Workshop on Knowledge Graph for Software Engineering (KG4SE 2020, co-located with ICSE 2020)
- Co-Reviewer 33rd IEEE/ACM International Conference on Automated Software Engineering (ASE 2018)
- Co-Reviewer 41st ACM/IEEE International Conference on Software Engineering (ICSE 2018)
- Co-Reviewer 34th IEEE International Conference on Software Maintenance and Evolution (ICSME 2018)

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## Teaching Experience

- Spring 2019 Teaching Assistant, Advanced Software Design, Graduate-level, Fudan University, China
- Summer 2017 Teaching Assistant, Software Design, Undergraduate-level, Fudan University, China
- Spring 2017 Teaching Assistant, Software Engineering, Undergraduate-level, Fudan University, China