

Jiawei Li

PHD CANDIDATE · SOFTWARE ENGINEERING

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Research Interests

My research interests mainly lie in the application of **machine learning and large language models** to the automation of **Software Engineering-related tasks** such as commit message quality evaluation and analysis, commit message generation, code/test smell detection and refactoring, defect prediction and more.

Education

University of California, Irvine

PHD SOFTWARE ENGINEERING

- Advisor: Dr. Iftekhar Ahmed

Irvine, CA

2021.09 - present

University of California, Irvine

MS COMPUTER SCIENCE

- Advisor: Dr. Iftekhar Ahmed

Irvine, CA

2019.09 - 2020.12

Xi'an Jiaotong University

BENG SOFTWARE ENGINEERING

Xi'an, China

2015.08 - 2019.06

Selected Projects

Commit Message Generation Leveraging Reasoning and Action of Large Language Model (ReAct)

Irvine, CA

ADVISOR: DR. IFTEKHAR AHMED

2023

- Identified additional commit message quality expectations from practitioners through an empirical analysis
- Built a ReAct-prompted LLM-powered commit message generation approach that has access to a diverse and large software context associated with the code change

Analysis of the Impact and Evolution of Commit Message Quality

Irvine, CA

ADVISOR: DR. IFTEKHAR AHMED

2022

- Showed that issue/pull request link content should be considered when measuring commit message quality
- Built a machine learning classifier that evaluates commit message quality
- Analyzed the impact of commit message quality on open-source software defect proneness
- Analyzed the evolution of commit message quality

Code Readability Estimation with Large Language Models

Irvine, CA

ADVISOR: DR. IFTEKHAR AHMED

2021

- Utilized the probability of large language models to construct features that measure code readability
- Conducted a correlation analysis between the proposed features and the human annotated readability scores

Publications

PUBLISHED

Jiawei Li, David Farago, Christian Petrov, Iftekhar Ahmed. 2024. Only diff is Not Enough: Generating Commit Messages Leveraging Reasoning and Action of Large Language Model. The ACM International Conference on the Foundations of Software Engineering 2024 (FSE).

Jiawei Li, Iftekhar Ahmed. 2023. Commit Message Matters: Investigating Impact and Evolution of Commit Message Quality. Proceedings of the 45th International Conference on Software Engineering (ICSE).

Tongjie Wang, Yaroslav Golubev, Oleg Smirnov, **Jiawei Li**, Timofey Bryksin, Iftekhar Ahmed. 2021. PyNose: A Test Smell Detector For Python. 2021 36th IEEE/ACM International Conference on Automated Software Engineering (ASE).

Jiri Gesi, **Jiawei Li**, Iftekhar Ahmed. 2021. An Empirical Examination of the Impact of Bias on Just-in-time Defect Prediction. Proceedings of the 15th ACM/IEEE International Symposium on Empirical Software Engineering and Measurement (ESEM).

IN PREP

Md Rakib Hossain Misu, **Jiawei Li**, Adithya Bhattiprolu, Yang Liu, Eduardo Almeida, Iftekhar Ahmed. 2023. Test Smell: A Parasitic Energy Consumer in Software Testing. arXiv preprint arXiv:2310.14548

Jiri Gesi, Siqi Liu, **Jiawei Li**, Iftekhar Ahmed, Nachiappan Nagappan, David Lo, Eduardo Santana de Almeida, Pavneet Singh Kochhar, Lingfeng Bao. 2022. Code Smells in Machine Learning Systems. arXiv preprint arXiv:2203.00803

Yaroslav Golubev, **Jiawei Li**, Viacheslav Bushev, Timofey Bryksin, Iftekhar Ahmed. 2021. Changes from the trenches: Should we automate them?. arXiv preprint arXiv:2105.10157

Mentorship and service

2023 Global Research Experience in Artificial Intelligence (GREAT) Program

Irvine, CA

GRADUATE MENTOR

2023.07 - 2023.09

- Experimented with various prompts to generate high-quality commit messages using large language models
- Used prompt engineering with large language models to automatically refactor test smells

2022 Global Research Experience in Artificial Intelligence (GREAT) Program

Irvine, CA

GRADUATE MENTOR

2022.07 - 2022.09

- Explored the impact of intermediate fine-tuning of large language models on the Software Engineering downstream task performance

Skills

Python, Java, R, Machine Learning, Natural Language Processing, Large Language Models, Prompt Engineering, Software Analysis, Statistical Analysis