

YINLIN DENG

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RESEARCH INTERESTS

My research interest lies broadly in the intersection of software engineering and machine learning. I am interested in developing intelligent analysis, testing, verification, and synthesis techniques to improve the reliability, robustness, and performance of software systems, especially for machine learning systems.

Currently, I focus on testing machine learning libraries, which serve as the foundation for building, training, and deploying deep learning models. My previous work has helped to find **353** real-world bugs in popular open-source deep learning libraries including [PyTorch](#), [TensorFlow](#), [JAX](#), and [OneFlow](#).

EDUCATION

University of Illinois Urbana-Champaign (UIUC)

Ph.D. student in Computer Science

Advisor: [Prof. Lingming Zhang](#)

Illinois, USA

Aug. 2021–present

Peking University

B.Sc. in Computer Science, Turing Class

Beijing, China

Sept. 2017–June 2021

PUBLICATIONS

Yinlin Deng, Chunqiu Steven Xia, Chenyuan Yang, Shizhuo Dylan Zhang, Shujing Yang, Lingming Zhang. Large Language Models are Edge-Case Generators: Crafting Unusual Programs for Fuzzing Deep Learning Libraries. *46th IEEE/ACM International Conference on Software Engineering (ICSE) 2024*. [\[preprint\]](#)

Yinlin Deng, Chunqiu Steven Xia, Haoran Peng, Chenyuan Yang, Lingming Zhang. Large Language Models are Zero-Shot Fuzzers: Fuzzing Deep-Learning Libraries via Large Language Models. *32nd ACM SIGSOFT International Symposium on Software Testing and Analysis (ISSTA) 2023*. [\[paper\]](#)[\[code\]](#)

Chenyuan Yang, **Yinlin Deng**, Jiayi Yao, Yuxing Tu, Hanchi Li, Lingming Zhang. Fuzzing Automatic Differentiation in Deep-Learning Libraries. *45th IEEE/ACM International Conference on Software Engineering (ICSE) 2023*. [\[paper\]](#)[\[code\]](#)

Yinlin Deng*, Chenyuan Yang*, Anjiang Wei, Lingming Zhang. Fuzzing Deep-Learning Libraries via Automated Relational API Inference. *30th ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE) 2022*. [\[paper\]](#) [\[code\]](#)

Anjiang Wei, **Yinlin Deng**, Chenyuan Yang, and Lingming Zhang. Free Lunch for Testing: Fuzzing Deep-Learning Libraries from Open Source. *44th IEEE/ACM International Conference on Software Engineering (ICSE) 2022*. [\[paper\]](#)[\[code\]](#)

Jiawei Liu, Yuxiang Wei, Sen Yang, **Yinlin Deng**, and Lingming Zhang. Coverage-Guided Tensor Compiler Fuzzing with Joint IR-Pass Mutation. *Proceedings of the ACM on Programming Languages 6 (OOPSLA1) 2022*. [\[paper\]](#)[\[code\]](#)[\[artifact\]](#)

* denotes equal contribution

PROFESSIONAL EXPERIENCE

Student Researcher at Google DeepMind

Topic: Program synthesis with large language models

Manager: Charles Sutton, Mentor: Kensen Shi

May 2023–present

Research Intern at Fujitsu Research of America

Topic: Feature engineering for Automated Machine Learning (AutoML)

Manager: Mukul Prasad, Mentor: Mehdi Bahrami

May 2022–Aug. 2022

Research Intern at Microsoft Research, Asia

June 2020—Jan. 2021

Topic: Table range detection for [Spreadsheet Intelligence](#)

Manager: Shi Han, Mentor: Xiao Lv

STEP Intern at Google

July 2019—Sept. 2019

Topic: Static deep learning model compression for [Federated Learning](#)**HONORS & AWARDS**

- NSF travel award for ICSE 2023
- SIGSOFT CAPS Travel Grant for ESEC/FSE 2022
- Gold Medal in the ICPC Asia-East Continent Final Contest 2019
- Gold Medal in the ICPC Asia Regional Contest Nanjing Site 2019
- Most innovative Project in Google AI/ML Winter Camp Beijing Site 2019
- Merit student in Peking University 2017
- Silver Medal in the National Olympiad in Informatics (NOI) 2015