

# YINLIN DENG

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## RESEARCH INTERESTS

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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

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**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

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**ExeDec: Execution Decomposition for Compositional Generalization in Neural Program Synthesis** [\[paper\]](#)

Kensen Shi, Joey Hong, **Yinlin Deng**, Pengcheng Yin, Manzil Zaheer, Charles Sutton.

*The Twelfth International Conference on Learning Representations (ICLR 2024 Oral).*

**Large Language Models are Edge-Case Generators: Crafting Unusual Programs for Fuzzing Deep Learning Libraries** [\[paper\]](#)

**Yinlin Deng**, Chunqiu Steven Xia, Chenyuan Yang, Shizhuo Dylan Zhang, Shujing Yang, Lingming Zhang.

*46th IEEE/ACM International Conference on Software Engineering (ICSE 2024).*

**Large Language Models are Zero-Shot Fuzzers: Fuzzing Deep-Learning Libraries via Large Language Models** [\[paper\]](#)[\[code\]](#)

**Yinlin Deng**, Chunqiu Steven Xia, Haoran Peng, Chenyuan Yang, Lingming Zhang.

*32nd ACM SIGSOFT International Symposium on Software Testing and Analysis (ISSTA 2023).*

**Fuzzing Automatic Differentiation in Deep-Learning Libraries** [\[paper\]](#)[\[code\]](#)

Chenyuan Yang, **Yinlin Deng**, Jiayi Yao, Yuxing Tu, Hanchi Li, Lingming Zhang.

*45th IEEE/ACM International Conference on Software Engineering (ICSE 2023).*

**Fuzzing Deep-Learning Libraries via Automated Relational API Inference** [\[paper\]](#) [\[code\]](#)

**Yinlin Deng\***, Chenyuan Yang\*, Anjiang Wei, Lingming Zhang.

*30th ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE 2022).*

**Free Lunch for Testing: Fuzzing Deep-Learning Libraries from Open Source** [\[paper\]](#)[\[code\]](#)

Anjiang Wei, **Yinlin Deng**, Chenyuan Yang, and Lingming Zhang.

*44th IEEE/ACM International Conference on Software Engineering (ICSE 2022).*

**Coverage-Guided Tensor Compiler Fuzzing with Joint IR-Pass Mutation** [\[paper\]](#)[\[code\]](#)[\[artifact\]](#)

Jiawei Liu, Yuxiang Wei, Sen Yang, **Yinlin Deng**, and Lingming Zhang.

*Proceedings of the ACM on Programming Languages 6 (OOPSLA1 2022).*

\* denotes equal contribution

## PROFESSIONAL EXPERIENCE

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**Student Researcher at Google DeepMind**

May 2023–Dec. 2023

Topic: Program synthesis with large language models

Manager: Charles Sutton, Mentor: Kensen Shi

**Research Intern at Fujitsu Research of America**

May 2022–Aug. 2022

Topic: Feature engineering for Automated Machine Learning (AutoML)

Manager: Mukul Prasad, Mentor: Mehdi Bahrami

**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**

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- 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