YINLIN DENG

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RESEARCH INTEREST

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) — **Illinois, USA**
Ph.D. student in Computer Science — Aug. 2021−May 2026(expected)
Advisor: Prof. Lingming Zhang

Peking University — **Beijing, China**
B.Sc. in Computer Science, Turing Class — 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 to equal contribution.*

PROFESSIONAL EXPERIENCE

Student Researcher at Google DeepMind — May 2023−present
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

- 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