

Chenyuan Yang

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RESEARCH INTEREST

My research aims to improve the *reliability* of software systems. I am interested in leveraging testing, analysis, and verification techniques to make software systems more *reliable* and *robust*, especially for machine learning systems. Besides, I enjoy contributing to the open-source community.

Currently, I focus on testing deep learning compilers, which are the central infrastructure for building, training, optimizing and deploying deep learning models. Until now, my work has totally detected **353** previously unknown bugs for widely-used deep learning libraries, including [PyTorch](#), [TensorFlow](#), [JAX](#), and [OneFlow](#).

EDUCATION

University of Illinois at Urbana-Champaign

Aug. 2022 - Present

Ph.D. Student in Computer Science, advised by Prof. [Lingming Zhang](#)

IL, US

Nanjing University

Sept. 2018 - Jul. 2022

B.Sc. in Computer Science and Technology, graduated with honors

Nanjing, China

- Enrolled in *Elite Class*, GPA 91.2/100, rank 1/24

PUBLICATION

TestEval: Benchmarking Large Language Models for Test Case Generation

Preprint 2024.

Wenhan Wang*, [Chenyuan Yang](#)*, Zhijie Wang*, Yuheng Huang, Zhaoyang Chu, Da Song, Lingming Zhang, An Ran Chen, Lei Ma. [\[paper\]](#) [\[code\]](#)

KernelGPT: Enhanced Kernel Fuzzing via Large Language Models

Preprint 2023.

[Chenyuan Yang](#), Zijie Zhao, Lingming Zhang. [\[paper\]](#) [\[code\]](#)

White-box Compiler Fuzzing Empowered by Large Language Models

Object-Oriented Programming, Systems, Languages, and Applications 2024 (in PACM PL) (OOPSLA) 2024.

[Chenyuan Yang](#), Yinlin Deng, Runyu Lu, Jiayi Yao, Jiawei Liu, Reyhaneh Jabbarvand, Lingming Zhang. [\[paper\]](#) [\[code\]](#)

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.

Yinlin Deng, Chunqiu Steven Xia, [Chenyuan Yang](#), Shizhuo Dylan Zhang, Shujing Yang, Lingming Zhang. [\[paper\]](#)

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.

Yinlin Deng, Chunqiu Steven Xia, Haoran Peng, [Chenyuan Yang](#), Lingming Zhang. [\[paper\]](#) [\[code\]](#)

Fuzzing Automatic Differentiation in Deep-Learning Libraries

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

[Chenyuan Yang](#), Yinlin Deng, Jiayi Yao, Yuxing Tu, Hanchi Li, Lingming Zhang. [\[paper\]](#) [\[code\]](#)

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.

Yinlin Deng*, [Chenyuan Yang](#)*, Anjiang Wei, Lingming Zhang. [\[paper\]](#) [\[code\]](#)

Free Lunch for Testing: Fuzzing Deep-Learning Libraries from Open Source

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

Anjiang Wei, Yinlin Deng, [Chenyuan Yang](#), Lingming Zhang. [\[paper\]](#) [\[code\]](#)

* denotes joint first authors

PROFESSIONAL EXPERIENCE

Research Intern at Systems Research Group, Microsoft Research <i>Hosted by Shan Lu</i> <i>Topic: Verus-Copilot - Teaching LLM to Verify Rust Programs Using Verus</i>	May. 2024 - August 2024
SWE Intern at Project Starline, Google <i>Hosted by Srinivas Kaza and Lukas Murmann</i> <i>Topic: JAXGL - Integrate High Performance Graphics Primitives into ML</i>	May. 2023 - August 2023
Research Assistant at PL/FM/SE Group, UIUC <i>Advised by Prof. Lingming Zhang</i> <i>Topic: Fuzzing DL libraries</i>	May. 2021 - Present
Research Assistant at SPAR Group, Nanjing University <i>Advised by Prof. Yanyan Jiang</i> <i>Topic: Testing</i>	Aug. 2020 - Apr. 2021

AWARDS

SIGSOFT CAPS Travel Grant for ESEC/FSE 2022	Sept. 2022
China National Scholarship Top 0.2%	Oct. 2020
Special Scholarship for Undergraduates in Basic Science, Nanjing University 1/24	Nov. 2021
Elite Program First-class Scholarship, Nanjing University	Oct. 2019

TALKS

Fuzzing Automatic Differentiation in Deep-Learning Libraries <ul style="list-style-type: none">Advanced Software Technologies Lab, ETH Zurich	May 2023
Fuzzing Deep-Learning Libraries via Automated Relational API Inference <ul style="list-style-type: none">Software Engineering Retreat, University of Illinois at Urbana-Champaign	Sept. 2022
Free Lunch for Testing: Fuzzing Deep-Learning Libraries from Open Source <ul style="list-style-type: none">iSE symposium, Nanjing University	May 2022

TEACHING EXPERIENCE

Teaching Assistant at Nanjing University <i>Problem Solving, a core course for the students in the elite program</i>	Sept. 2021 - Jul. 2022
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SKILL STACK

- **Common:** Python, C, TypeScript, docker, Vim, Git, SQL, \LaTeX , libFuzzer
- **Machine Learning:** PyTorch, TensorFlow, JAX