Yuhao Zhang

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EDUCATION

University of Wisconsin-Madison Aug 2019 - May 2024 (expected)
PhD Student in Computer Science, GPA: 3.96 Madison, WI

Peking University Sept 2015 - Jul 2019
B.S. in Computer Science and Technology, Summa Cum Laude, Outstanding Undergraduate Student Beijing, CN

PUBLICATIONS

(* stands for equal contribution) (first or co-first author publications highlighted)

Linyi Li, **Yuhao Zhang**, Luyao Ren, Yingfei Xiong, Tao Xie, "Reliability Assurance for Deep Neural Network Architectures Against Numerical Defects" in *45th International Conference on Software Engineering (**ICSE 2023**)*.

Yuhao Zhang, Aws Albarghouthi, Loris D'Antoni, "BagFlip: A Certified Defense against Data Poisoning" in *Thirty-sixth Conference on Neural Information Processing Systems (**Neurips 2022**)*.

Yuhao Zhang*, Yasharth Bajpai*, Priyanshu Gupta*, Ameya Ketkar*, Miltiadis Allamanis, Titus Barik, Sumit Gulwani, Arjun Radhakrishna, Mohammad Raza, Gustavo Soares, and Ashish Tiwari, "Overwatch: Learning Patterns in Code Edit Sequences" in *Object-Oriented Programming, Systems, Languages & Applications (**OOPSLA 2022**)*.

Yuhao Zhang, Aws Albarghouthi, Loris D'Antoni, "Certified Robustness to Programmable Transformations in LSTMs" in *Proceedings of the 2021 Conference on Empirical Methods in Natural Language Processing (**Oral Presentation** **EMNLP 2021**)*.

Yuhao Zhang, Luyao Ren, Liqian Chen, Yingfei Xiong, Shing-Chi Cheung, Tao Xie, "Detecting Numerical Bugs in Neural Network Architectures" in *Proceedings of the ACM Joint European Software Engineering Conference and Symposium on the Foundations of Software Engineering (**ACM Distinguished Paper Award** **ESEC/FSE 2020**)*.

Yuhao Zhang, Aws Albarghouthi, Loris D'Antoni, "Robustness to Programmable String Transformations via Augmented Abstract Training" in *Proceedings of the Thirty-seventh International Conference on Machine Learning (**ICML 2020**)*.

Yuhao Zhang, Yifan Chen, Shing-Chi Cheung, Yingfei Xiong, and Lu Zhang, "An Empirical Study on TensorFlow Program Bugs" in *Proceedings of the 27th ACM SIGSOFT International Symposium on Software Testing and Analysis (**ISSTA 2018**)*.

PROFESSIONAL EXPERIENCE

Amazon May 2023 - Aug 2023
Applied Scientist Intern - CodeWhisperer Team [Python] New York, NY

· Enhanced the robustness of large language models for code generation, resulting in a 41% improvement.
· Developed a robust training framework, designed for future integration into **Amazon CodeWhisperer**.
· Contributions to the ReCode benchmark, providing a robust evaluation method for code generation models.
· Inclined for a Level 5, Applied Scientist position at Amazon.

Microsoft May 2021 - Aug 2021 & Feb 2022 - April 2022
Research Intern - PROSE (Programming by Examples and Natural Language) Team [C#/Python] Remote

· Contributed to the Blue-Pencil project, a key initiative behind **Visual Studio IntelliCode**.
· Designed a unique representation for storing source code editing patterns from developer traces.
· Built a framework that effectively learns and applies hundreds of patterns, achieving a precision rate of 78%.
· The implementation of the new framework led to a 4X increase in user adoption of the tool.

Microsoft Research Sept 2018 - March 2019
Research Intern - DKI (Data, Knowledge, Intelligence) Group [C#/Python] Beijing, CN

· Contributed to **Ideas**, an Excel plugin designed to provide high-level visual summaries for data analysts.
· Enhanced the classification accuracy of the intermediary model from 88% to 93% across six primary languages.
· Implemented the Aho–Corasick algorithm, accelerating column header matching by 4X.
· Developed a grid search algorithm for hyperparameter tuning, which was subsequently adopted by other groups.
· Recognized for outstanding performance and contributions with the **Award of Excellence**.

PROJECTS

Forward-mode Automatic Differentiation (AD) for Angora Fuzzer Feb 2020 - May 2020
Implemented a more precise method for computing partial derivatives in Angora [C++/LLVM/Rust]

· Developed an `Int` class to compute partial derivatives while maintaining the original semantics of the int type.
· Instrumented the intermediate representation to replace primitive int types with the `Int` class using LLVM.
· Integrated new trace functions in the compiled binary for communication with Angora Fuzzer via proxy calls.

Course Scheduling System for Peking University Sept 2017 - May 2018
Developed a system generating course schedules, outperforming the dean's design on three metrics [Python/C++]

· Cleaned and analyzed raw data provided by the dean, encompassing 529 majors across 39 departments.
· Devised a simulated annealing algorithm to resolve thousands of classroom conflicts and balance course density.
· Established a pipeline for data preprocessing, tabu search, simulated annealing, and schedule generation.

PKURUNNER Application Apr 2016 - Jun 2018
Developed an Android application used by over 2000 students each year to record their running traces [Java]

· Designed and implemented a user-friendly GUI showing the map, current location, running trace, and other metrics.
· Developed user interaction logic to start, pause, and stop running sessions.
· Integrated Gaode Maps APIs to capture the GPS locations of the user and package the trace data for server upload.

AWARDS

Research

· Neurips 2022 Top Reviewer
· ACM Distinguished Paper Award at ESEC/FSE 2020

ACM-ICPC

· Ho-Chi-Minh City Regional **4th place**, 2017
· Xi'an Regional **Gold**, 2017
· Yangon Regional **7th place**, 2016
· Dalian Regional **Gold**, 2016
· Hefei Regional **Gold** 2015

NOI

· National Olympiad of Informatics, **Gold Medal**, 2014

Scholarships

· Finalist in Two Sigma PhD Fellowship 2022
· SenseTime Scholarship 2019
· Suzhou Industrial Park Scholarship 2018
· Schlumberger Scholarship 2017
· iPinYou Scholarship 2016

SERVICE

BANDS 2023, Program Committee
FoMLAS 2023, 2022, 2021, Program Committee
ICML 2023, 2022, 2021, Reviewer
Neurips 2023, 2022, Reviewer
VMCAI 2023, Artifact Evaluation Committee
CAV 2021, Artifact Evaluation Committee