

# Yuhao Zhang

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## EDUCATION

### University of Wisconsin-Madison

PhD Student in Computer Science, GPA: 3.9

Aug 2019 - Present

Madison, WI

### Peking University

B.S. in Computer Science and Technology, Summa Cum Laude, Outstanding Undergraduate Student Beijing, CN

Sept 2015 - Jul 2019

## PUBLICATIONS

**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 (EMNLP 2021)*, Online and Punta Cana, Dominican Republic

**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 (ESEC/FSE 2020)*, Online, United States.

**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)*, Online, Austria

**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)*, Amsterdam, Netherlands

## SKILLS

<b>Languages</b>	C++, C, C#, Python, OCaml, Rust, Scheme, Java, JavaScript, HTML, CSS, PHP, Verilog
<b>Technologies</b>	Git, TensorFlow, Keras, Pytorch, LLVM, MySQL

## PROFESSIONAL EXPERIENCE

### Microsoft

May 2021 - Aug 2021

Research Intern - PROSE (Programming by Examples and Natural Language) Team [C#/Python] Remote

- Worked on the Blue-Pencil project, the main technology behind **Visual Studio IntelliCode Suggestions**.
- Designed the representation, temporal edit templates for storing thousands of mined edit sequence patterns.
- Implemented the framework that learned hundreds of temporal edit templates and achieved 30% precision.
- Generated a dataset that helped other researchers to conduct future research on the learned temporal edit templates.

### Microsoft Research Asia

Sept 2018 - March 2019

Development Intern - DKI (Data, Knowledge, Intelligence) Group [C#/Python] Beijing, CN

- Worked on **Ideas**, a plugin in Excel, which analyzes and provides high-level visual summaries for data analysts.
- Improved the classification accuracy of the intermediary model from 88% to 93% for six primary languages.
- Accelerated 4X column headers' matching speed with target phrases by implementing the Aho-Corasick algorithm.
- Tuned the hyperparameters of models by implementing a grid search algorithm, which is used by other groups.
- Won the **Award of Excellence** during the internship.

## PROJECTS

### Forward-mode Automatic Differentiation (AD) for Angora Fuzzer

Feb 2020 - May 2020

Forward-mode AD computes more precise partial derivatives than the counterpart in Angora [C++/LLVM/Rust]

- Implemented an `Int` class to compute partial derivatives while keeping the original semantics of primitive int types.
- Instrumented the intermediate representation to surrogate the primitive int types with the `Int` class using LLVM.
- Registered new trace functions in compiled binary for communicating with Angora Fuzzer by proxy calls.

### Course Scheduling System for Peking University

Sept 2017 - May 2018

Course schedules generated by our system outperformed the dean's design on three metrics [Python/C++]

- Cleaned data and mined rules in raw data provided by the dean containing 529 majors in 39 departments.
- Designed a simulated annealing algorithm to solve thousands classroom conflicts and smooth the course density.
- Pipelined the components: data preprocessing, tabu search, simulated annealing, and generating course schedules.

### **PKURUNNER Application**

Apr 2016 - Jun 2018

The Android application is used by more than 2000 students for recording their running traces [Java]

- Implemented the GUI showing the map, the current location, the running trace, and metrics like running speed.
- Designed and implemented the logics interacting with the users to start, pause, and stop running.
- Invoked Gaode Maps APIs to get the GPS locations of the user and packed the trace for uploading to the server.

## **HONORS AND AWARDS**

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### **Research**

- ACM Distinguished Paper Award at ESEC/FSE 2020

### **ACM-ICPC**

- Asia Pacific Region: Ho-Chi-Minh City Regional **4th place**, 2017; Yangon Regional **7th place**, 2016.
- Asia East Continent Region: Xi'an Regional **Gold**, 2017; Dalian Regional **Gold**, 2016; Hefei Regional **Gold**, 2015.

### **Scholarships**

- SenseTime Scholarship 2019; Suzhou Industrial Park Scholarship 2018; Schlumberger Scholarship 2017; iPinYou Scholarship 2016

## **SERVICE**

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FoMLAS 21, Program Committee

CAV 21, Artifact Evaluation Committee

ICML 21, Reviewer