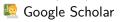
# Jiahao Zhang

1 Nashville, TN, USA

**☆**Homepage



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### **Education**

Vanderbilt University

TN, USA

Ph.D. in Computer Science Advisor: Prof. Yu Huang

Guangdong, China

Aug. 2024 - Present

**Southern University of Science and Technology** *B.E. in Computer Science and Technology* 

Sept. 2020 - June 2024

Highest Honors in Computer Science and Engineering

Advisor: Prof. Yepang Liu

IN, USA

**University of Notre Dame** *Exchange Student* 

Aug. 2023 - Dec. 2023

Advisor: Prof. Joanna C.S. Santos

CA. USA

UCInspire Spring Research Program

Mar. 2023 - July 2023

Advisor: Prof. Marco Levorato

University of California, Irvine

## Publications (\*equal contribution)

## [C1] Re(gEx|DoS)Eval: Evaluating Generated Regular Expressions and their Proneness to DoS Attacks

ML Siddig, Jiahao Zhang, Lindsay Roney, and Joanna C.S. Santos

[URL]

Proceedings of the 46th International Conference on Software Engineering

ICSE (NIER Track), 2024

#### [C2] Understanding ReDoS: Insights from LLM-Generated Regexes and Developer Forums

ML Siddig\*, Jiahao Zhang\*, and Joanna C.S. Santos

[URL]

Proceedings of the 32nd International Conference on Program Comprehension ICPC (Research Track), 2024

## [C3] Quality Assessment of ChatGPT Generated Code and their Use by Developers

ML Siddiq, Lindsay Roney, Jiahao Zhang, and Joanna C.S. Santos

[URL]

Proceedings of the 21st International Conference on Mining Software Repositories

MSR (Mining Challenge Track), 2024

## Research Experiences

#### **University of Notre Dame**

Aug. 2023 - Dec. 2023

Supervised by Prof. Joanna C.S. Santos

Research Topics: Software Security, Mining Software Repositories, AI4SE, LLM

- Designed Re(gEx|DoS)Eval, a framework for systematically evaluating the correctness and security against ReDoS attacks of regexes generated by large language models. Included a high-quality dataset, refined prompts, test cases, and novel metrics for functional correctness and vulnerability assessment [C1].
- Addressed critical gaps in understanding the capabilities of LLMs in generating non-vulnerable and functionally correct regular expressions. Empirically evaluated three LLMs for correct and secure regex generation, compared characteristics of LLM-generated ReDoS vulnerabilities with real-world cases, and analyzed the developer community's discussion on ReDoS issues with data collected from GitHub and StackOverflow [C2].
- Analyzed the quality and usage of ChatGPT-generated code in software development, examining its integration into software repositories and its broader applications in learning new frameworks and development kits [C3].

## Southern University of Science and Technology

Supervised by Prof. Yepang Liu

Research Topics: Program Repair, Software Evolution, Mining Software Repositories, AI4SE, LLM

 Proposed a novel "history-driven" approach for Just-In-Time (JIT) method renaming, leveraging the extensive history of code changes combined with the advanced capabilities of large language models (LLMs). This bolstered software reliability and understandability by providing more accurate method names, informed by the most similar code change in history.

#### University of California, Irvine

Mar. 2023 - July 2023

Aug. 2022 - July. 2023

Supervised by Prof. Marco Levorato

Research Topics: Computational Slicing, Resource Allocation, Traffic Shaping

Introduced a computational slicing framework that leveraged traffic shaping to indirectly control application
processing time by managing byte flow into the CPU. This offered an abstraction over direct CPU cycle control,
beneficial for testing delay-sensitive applications across diverse hardware and firmware setups.

## Teaching Experience

Teaching Assistant of CS201: Discrete Mathematics Fall 2022, Spring 2023

## Skills

**Frameworks** 

Programming Languages Skilled: Java, Python, LATEX

Familiar: C/C++, SQL, HTML/CSS, JavaScript/TypeScript, Scheme, Verilog PyTorch, Langchain, React, Next.js, Spring Boot, Django, CherryPy, Node.js

Language Proficiency Mandarin - native, English - fluent (IELTS: 7.5, CET-6: 634)