

# Jie Hu

## University of California Riverside

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## Research Interest

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Computer System Security, Dynamic Program Analysis, Vulnerability Detection, Deep Learning, Software Engineering.

## Education

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**Ph.D. in Computer Science** 09/2017-09/2024(Expected)  
University of California Riverside (UCR), CA, USA  
Advisor: Prof. [Heng Yin](#)  
**B.E. in Computer Science** 09/2013-06/2017  
Huazhong University of Science and Technology, Wuhan, China

## Professional Experience

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**Graduate Student Researcher** UCR 09/2017 - Present  
*LLM-Based Solutions for Path Divergence in Concolic Execution*

- Tackling path divergence, an open challenge in concolic execution, via a novel LLM-based approach.

*Augmenting Greybox Fuzzing with Generative AI*

- Designed three research questions to drive a systematic study on LLMs' fuzzing capabilities, and present our findings.
- Provide guidance on how to build an effective LLM-based greybox fuzzer that is not limited to existing LLMs but also considers future LLMs.

*Marco: A Stochastic Asynchronous Concolic Explorer*

- Evaluated the state-of-the-art branch-flipping policy and reveal several important yet unreported limitations.
- Proposed a stochastic and asynchronous branch scheduling algorithm that is able to effectively pick the most promising branch for new input generation.

**Teaching Assistant** UCR 01/2019 - 03/2024  
• Served as teaching assistant for several computer science courses, including C++/Python/Assembly Language Programming, Operating System, Computer Security, Software Testing and Verification.

**Security Research Intern** Baidu USA 07/2020 - 12/2020  
• Conducted research for developing techniques to improve the effectiveness and efficiency of concolic executor which is a commonly used method for program analysis.

**Software Engineer Intern** MoboTap(Wuhan) Inc. 08/2016 - 05/2017  
• Focused on the applications of convolutional neural network (CNN) model on image analysis.

## Publication

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- (In Progress) Jie Hu, Heng Yin, LLM-Based Solutions for Path Divergence in Concolic Execution.
- (Under Submission) Jie Hu, Heng Yin, How Well can LLMs Generate Fuzzing Inputs?
- (USENIX'24) Zhenxiao Qi, Jie Hu, Zhaoqi Xiao, and Heng Yin, SymFit: Making the Common (Concrete) Case Fast for Binary-Code Concolic Execution, to appear in the 33rd USENIX Security Symposium, August 2024.
- (ICSE'24) Jie Hu, Yue Duan, and Heng Yin, [Marco: A Stochastic and Asynchronous Concolic Explorer](#), to appear in the 46th International Conference on Software Engineering, April 2024.
- (RAID'19) Yue Duan, Lian Gao, Jie Hu, and Heng Yin, [Automatic Generation of Non-intrusive Updates for Third-Party Libraries in Android Applications](#), in the 22nd International Symposium on Research in Attacks, Intrusions and Defenses, September 2019.

## Skills & Other

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Languages: C/C++, Python

Program Analysis Tools: AFL/AFL++, QSYM, SymSan, Marco

## Honors & Awards

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- (2023-2024) Outstanding Teaching Assistant in CSE Department
- (2017-2018) Dean's Distinguished Fellowship, UC Riverside

## Professional Service

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### Journal Reviewer

- TDSC 2022, 2024
- PeerJ Computer Science

### External Conference Reviewer

- S&P 2021, 2022, 2024
- RAID 2023
- DIMVA 2019
- USENIX 2021, 2022
- AsiaCCS 2019, 2020