

JIARONG XING

3002 Duncan Hall, 6100 Main Street, Houston, TX 77005
(+1) 713-517-3508 • jxing@rice.edu • <https://jxing.me>

RESEARCH INTERESTS

Systems, Networking, Security

My research is in the general area of systems, networking, and security. My work co-designs the infrastructure hardware and software stacks to achieve high performance, reliability, and security. My recent interests also extend to machine learning systems, disaggregated systems, and 5G security.

EDUCATION

Rice University

Ph.D. Candidate, Department of Computer Science

Advisor: Ang Chen

Houston, Texas, United States

Aug. 2018 - May 2024 (Expected)

Shandong University

Bachelor of Engineering, Department of Software Engineering

Advisor: Hongjun Dai

Jinan, Shandong, China

Sep. 2013 - May 2017

AWARDS AND HONORS

- USENIX Security Distinguished Paper Award 2023
- Future Faculty Fellowship, Rice University 2023
- Google PhD Fellowship for Systems and Networking 2022
4 students selected worldwide
- Meta PhD Fellowship finalists for Systems and Networking 2022
6 students selected worldwide
- Lodieska Stockbridge Vaughn Fellowship, Rice University 2021
3 students selected university-wide
- Ken Kennedy Institute Andrew Ladd Graduate Fellowship, Rice University 2020
1 CS student selected
- Outstanding Undergraduates, Shandong Province 2017
- Presidential Scholarship, Shandong University 2016
The highest honor for undergraduate
- National Scholarship, Ministry of Education, China 2014, 2015, 2016

PUBLICATIONS

Conference papers

[1] **Unleashing SmartNIC Packet Processing Performance in P4**

Jiarong Xing, Yiming Qiu, Kuo-Feng Hsu, Songyuan Sui, Khalid Manaa, Omer Shabtai, Yonatan Piasetzky, Matty Kadosh, Arvind Krishnamurthy, T. S. Eugene Ng, and Ang Chen
ACM SIGCOMM 2023

Featured by Nvidia at HotChips 2023

- [2] **Enabling Resilience in Virtualized RANs with Atlas**
Jiarong Xing*, Junzhi Gong*, Xenofon Foukas, Anuj Kalia, Daehyeok Kim,
 and Manikanta Kotaru
ACM MobiCom 2023
 Featured by Microsoft at MWC Barcelona 2023
- [3] **Remote Direct Memory Introspection**
 Hongyi Liu, **Jiarong Xing**, Yibo Huang, Danyang Zhuo, Srinivas Devadas, and Ang Chen
USENIX Security 2023
 Distinguished Paper Award
- [4] **Runtime Programmable Switches**
Jiarong Xing, Kuo-Feng Hsu, Matty Kadosh, Alan Lo, Yonatan Piasetzky, Arvind
 Krishnamurthy, and Ang Chen
USENIX NSDI 2022
 Featured by Nvidia at HotChips 2023
- [5] **Bedrock: Programmable Network Support for Secure RDMA Systems**
Jiarong Xing*, Kuo-Feng Hsu*, Yiming Qiu, Ziyang Yang, Hongyi Liu, and Ang Chen
USENIX Security 2022
- [6] **Bolt: Bridging the Gap between Auto-tuners and Hardware-native Performance**
Jiarong Xing*, Leyuan Wang*, Shang Zhang, Jack Chen, Ang Chen, and Yibo Zhu
MLSys 2022
 Used by TikTok/Bytedance
- [7] **Symbolic Distillation for Learned TCP Congestion Control**
 S P Sharan, Wenqing Zheng, Kuo-Feng Hsu, **Jiarong Xing**, Ang Chen, and Zhangyang Wang
NeurIPS 2022
- [8] **Automating SmartNIC Offloading Insights for Network Functions**
 Yiming Qiu, **Jiarong Xing**, Kuo-Feng Hsu, Qiao Kang, Ming Liu, Srinivas Narayana,
 and Ang Chen
ACM SOSP 2021
- [9] **Ripple: A Programmable, Decentralized Link-Flooding Defense Against Adaptive Adversaries**
Jiarong Xing, Wenqing Wu, and Ang Chen
USENIX Security 2021
- [10] **Probabilistic Profiling of Stateful Data Planes for Adversarial Testing**
 Qiao Kang*, **Jiarong Xing***, Yiming Qiu, and Ang Chen
ACM ASPLOS 2021
- [11] **Mitigating Network Covert Channels while Preserving Performance**
Jiarong Xing, Qiao Kang, and Ang Chen
USENIX Security 2020

Workshop papers

- [12] **Simplifying Cloud Management with Cloudless Computing**
 Yiming Qiu, Patrick Tser Jern Kon, **Jiarong Xing**, Yibo Huang, Hongyi Liu, Xinyu Wang,
 Peng Huang, Mosharaf Chowdhury, and Ang Chen
ACM HotNets 2023

*Equal contribution

- [13] **A Vision for Runtime Programmable Networks**
Jiarong Xing, Yiming Qiu, Kuo-Feng Hsu, Hongyi Liu, Matty Kadosh, Alan Lo, Aditya Akella, Thomas Anderson, Arvind Krishnamurthy, T. S. Eugene Ng, and Ang Chen
ACM HotNets 2021
- [14] **Secure State Migration in the Data Plane**
Jiarong Xing, Ang Chen, and T.S. Eugene Ng
ACM SIGCOMM SPIN 2020
- [15] **A Feasibility Study on Time-aware Monitoring with Commodity Switches**
Yiming Qiu, Kuo-Feng Hsu, **Jiarong Xing**, and Ang Chen
ACM SIGCOMM SPIN 2020
- [16] **Architecting Programmable Data Plane Defenses into the Network with FastFlex**
Jiarong Xing, Wenqing Wu and Ang Chen
ACM HotNets 2019
- [17] **Automated Attack Discovery in Data Plane Systems**
Qiao Kang, **Jiarong Xing**, and Ang Chen
USENIX CSET 2019
- [18] **NetWarden: Mitigating Network Covert Channels without Performance Loss**
Jiarong Xing, Adam Morrison, and Ang Chen
USENIX HotCloud 2019

Papers under preparation

- [19] **Reliable Network Management with a Principled Programming System**
Jiarong Xing, Kuo-Feng Hsu, Yiting Xia, Yan Cai, Yanping Li, Ying Zhang, and Ang Chen
- [20] **Understanding the Security Vulnerabilities in Open 5G Fronthaul Networks**
Jiarong Xing, Sophia Yoo, Xenofon Foukas, Daehyeok Kim, Michael K. Reiter

SERVICE

Program committee

- IEEE Symposium on Security and Privacy 2024
- EuroP4 Workshop 2023
- ACM SIGCOMM Posters and Demos 2022
- ACM SIGCOMM FFSPIN Workshop 2022
- ACM SIGCOMM SPIN Workshop 2021
- EuroSys Shadow PC 2021

Journal reviewer

- IEEE/ACM Transactions on Networking
- IEEE Transactions on Parallel and Distributed Systems
- Journal of Systems Research

Conference web chair

- ACM SIGCOMM SPIN Workshop 2020

INDUSTRY RESEARCH EXPERIENCE

Microsoft, Research Intern Mar. 2023 - Oct. 2023

Mentors: Daehyeok Kim and Xenofon Foukas

Worked on identifying security vulnerabilities in open 5G radio access networks [20].

Microsoft, Research Intern May 2022 - Mar. 2023

Mentors: Daehyeok Kim, Xenofon Foukas, Anuj Kalia, and Manikanta Kotaru

Built resilient 5G radio access networks using radio sharing techniques [2].

TikTok/Bytedance, Research Intern May 2021 - Oct. 2021

Mentor: Leyuan Wang and Yibo Zhu

Worked on accelerating deep neural network inference using hardware-native templated search [6].

TEACHING

Guest Lecturer

- COMP/ELEC 429/556: Introduction to Computer Networks Fall 2023
- COMP 436/536: Secure and Cloud Computing Fall 2019, 2020, 2021

Teaching Assistant

- COMP 436/536: Secure and Cloud Computing Fall 2019, 2020
- COMP 530: Database System Implementation Spring 2020
- COMP 421/521: Operating Systems and Concurrent Programming Spring 2019

TALKS

- **Unleashing SmartNIC Packet Processing Performance in P4**
SIGCOMM 2023
- **Runtime Programmable Switches,**
NSDI 2022, P4 Portable NIC Architecture meeting 2023, P4TC meeting 2023, Harvard University 2022, Tsinghua University 2022
- **Bedrock: Programmable Network Support for Secure RDMA Systems**
USENIX Security 2022
- **Bolt: Bridging the Gap between Auto-tuners and Hardware-native Performance**
MLSys 2022
- **Ripple: A Programmable, Decentralized Link-Flooding Defense Against Adaptive Adversaries**
USENIX Security 2021
- **Mitigating Network Covert Channels while Preserving Performance**
USENIX Security 2020, P4 Expert Roundtable Series 2020, University of Washington 2020, USENIX HotCloud 2019
- **Secure State Migration in the Data Plane**
SIGCOMM SPIN 2020
- **Architecting Programmable Data Plane Defenses into the Network with FastFlex**
HotNets 2019