

Xinhao Kong

Email: xinhao.kong@duke.edu

Website: <https://sigempty.github.io>

EDUCATION

- **Duke University** 2021 - Now
Ph.D. in Computer Science GPA: 4.0/4.0
 - Advisor: Danyang Zhuo
- **Peking University** 2016 - 2020
B.S. in Computer Science GPA: 3.65/4.0
 - Advisor: Guangyu Sun
- **Hong Kong University of Science and Technology** 2019
Exchange student in Computer Science and Engineering GPA: 4.25/4.0
 - Advisor: Kai Chen

RESEARCH INTEREST

- **RDMA-Bench: Benchmark Framework for Systematic RDMA Performance Tests**
 - Uncover performance anomalies in RDMA subsystems.
 - Understand and mitigate performance interference in RDMA networks.
 - Vulnerabilities uncovered in NVIDIA ConnectX-5 and ConnectX-6 NICs.
 - * [Security Bulletin: NVIDIA ConnectX - April 2023](#)
- **Nextgen-RDMA: Towards Next Generations of Hyper-Scale RDMA Networks**
 - Hardware-software co-design solutions for multi-tenant RDMA in public clouds.
 - Revisit transport and application design for cross datacenter long-haul RDMA networks.
 - Automatic RDMA performance tuning and diagnosis for GPU-centered AI networks.

PUBLICATIONS ([GOOGLE SCHOLARS](#))

Conference Papers

1. **Xinhao Kong**, Jingrong Chen, Wei Bai, Yechen Xu, Mahmoud Elhaddad, Shachar Raindel, Jitendra Padhye, Alvin R. Lebeck, Danyang Zhuo. **Understanding RDMA Microarchitecture Resources for Performance Isolation**. In *20th USENIX Symposium on Networked Systems Design and Implementation (NSDI 2023)*.
2. Jingrong Chen, Yongji Wu, Shihan Lin, Yechen Xu, **Xinhao Kong**, Thomas Anderson, Matthew Lentz, Xiaowei Yang, Danyang Zhuo. **Remote Procedure Call as a Managed System Service**. In *20th USENIX Symposium on Networked Systems Design and Implementation (NSDI 2023)*.
3. **Xinhao Kong**, Yibo Zhu, Huaping Zhou, Zhuo Jiang, Jianxi Ye, Chuanxiong Guo, and Danyang Zhuo. **Collie: Finding performance anomalies in RDMA subsystems**. In *19th USENIX Symposium on Networked Systems Design and Implementation (NSDI 2022)*.

Workshop Papers

1. **Xinhao Kong**, Jiaqi Lou, Wei Bai, Nam Sung Kim, Danyang Zhuo. **Towards A Manageable Intra-Host Network**. In *Proceedings of the 19th Workshop on Hot Topics in Operating Systems (HotOS 2023)*.

INDUSTRY EXPERIENCE

- **Research SDE Intern** **Microsoft**
Team: Azure Core Host Networking May. 2023 - Aug. 2023
 - Apply RDMA-Bench to Microsoft Azure Network Adapter (MANA) to expose performance issues and vulnerabilities.
 - Investigate and fix the uncovered issues to improve MANA's reliability and efficiency.
 - Shadow oncall and assist to handle OpenAI RDMA network performance issues.
- **Research SDE Intern** **Microsoft**
Team: Azure Core Host Networking May. 2022 - Aug. 2022

- Systematically uncover performance issues and interference vulnerabilities of Azure accelerated networks.
- Collaborate with vendors to investigate and fix the uncovered issues.

- **Software Engineer**

Team: Data/Sys/Networking

ByteDance

Sep. 2020 - May. 2021

- Design, implement, and deploy RDMA-based Pingmesh for ByteDance RDMA telemetry systems.
- Test and find-tune customized DGX servers to enable extremely high speed RDMA for machine learning applications.
- Operate RDMA networks to support large-scale machine learning workloads for Applied Machine Learning team.

TEACHING SERVICES

- **Teaching Assistant**

Graduate Course: Distributed Systems

Duke University

Feb. 2023 - May. 2023

- **Teaching Assistant**

Undergraduate Course: Introduction to Operating System

Duke University

Sep. 2022 - Jan. 2023

- Received an exceptional course evaluation score of 4.62/5.0 (university average is 4.13).

- **Teaching Assistant**

Undergraduate Course: Introduction to Computer Systems

Peking University

Sep. 2018 - Jan. 2019

INVITED TALKS

- **Towards a Manageable Intra-Host Network**

- HotOS 2023

June, 2023

- **Understanding RDMA Microarchitecture Resources for Performance Isolation**

- USENIX NSDI 2023

April, 2023

- Microsoft Research and Microsoft Azure

Aug, 2022

- **Collie: Finding Performance Anomalies in RDMA Subsystems**

- Harvard Cloud & Network System Group

May, 2022

- USENIX NSDI 2022

April, 2022

- Student Lightning Talk @Google Networking Research Summit 2022

March, 2022

- Microsoft Research and Microsoft Azure

Sep, 2021

AWARDS

- Duke Outstanding Research in Progress Award 2023
- Duke Outstanding Teaching Assistant Award 2023
- NSDI '23 Student Grant 2023
- NSDI '22 Student Grant 2022
- Duke Ph.D. Fellowship 2021-2022
- Outstanding Graduate of Peking University 2020
- Beijing Innovation Fund 2019
- Huirong Li Scholarship (top 5%) 2018