XIAO, Yunming

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RESEARCH INTERESTS

I am broadly interested in computer systems, networks, and security. My current research focuses on (i) security and privacy of Internet services and (ii) performance and reliability of cloud infrastructure.

EDUCATION

Ph.D., Computer Science — Sep 2019 - Jun 2024
Northwestern University, Evanston, IL
Thesis: *Revising System Premises For a Secure and Private Web*
Advisor: Aleksandar Kuzmanovic

B.Eng., Computer Science — Sep 2015 - Jun 2019
Beijing University of Posts and Telecommunications, Beijing, China

RESEARCH AND WORK EXPERIENCE

Chinese University of Hong Kong (CUHK), Shenzhen, China — Jul 2025 - *Present*
Assistant Professor, School of Data Science

University of Michigan, Ann Arbor, MI — Jun 2024 - Jun 2025
Research Fellow, Advisor: *Prof. Ang Chen*

Northwestern University, Evanston, IL — Sep 2019 - May 2024
Research Assistant, Advisor: *Prof. Aleksandar Kuzmanovic*

Hewlett Packard Labs, Milpitas, CA — May - Aug 2022 (Full time) & Jan 2023 - Jan 2024 (Part-time)
Research Intern, Networking and Distributed Systems Lab, Host: *Dr. Puneet Sharma*

Google, New York City, NY — Sep - Dec 2022
PhD Software Engineering Intern, Technical Systems & Infrastructure (TI)

Nokia Bell Labs, Murray Hill, NJ (Remote) — Jun - Aug 2021
Networking Bell Labs Summer Intern, Host: *Dr. Matteo Varvello, Dr. T.V. Lakshman*

Bytedance, Beijing, China — Mar - Jul 2019
Infrastructure R&D Intern

Tsinghua University, Beijing, China — Mar 2018 - Mar 2019
Research Assistant, Host: *Prof. Wenfei Wu*

King Abdullah University of Science and Technology, Jeddah, KSA — Jul - Oct 2018
Visiting Student, Host: *Prof. Marco Canini*

AWARDS

APNet Best Paper Award, 2025
NSF NeTS Early Career Workshop Travel Grant, 2025
EuroSys Best Student Paper Award, 2024
Northwestern University PhD Terminal Year Fellowship, 2023
Travel Grant For ACM HotNets'23
HPE Best-in-Class Technical Competition Award, 2022
Distinguished Undergraduate Student in Beijing, 2019
Bronze Medal of the 31st Chinese Physics Olympiad, 2014

TEACHING EXPERIENCE

Lecturer, CUHK-Shenzhen
- CSC1001: Introduction to Computer Science: Programming Methodology – Fall 2025
- CSC3150: Operating System – Spring 2026

Teaching Assistant, Northwestern University
- COMP_SCI 397/497: Selected Topics in Computer Networks – Spring 2021, 2022, 2023, 2024
- COMP_SCI 340: Intro to Computer Networking – Winter 2022
- COMP_SCI 110: Intro to Computer Programming – Fall 2020

ADVISING AND MENTORING

Ph.D. Students, CUHK-Shenzhen
- Chengxuan Pei, 2025 - *Present*
- Cheng Li, 2025 - *Present*

Undergraduate Students, CUHK-Shenzhen
- Danyang Chen, 2026 - *Present*
- Qingning Shen, 2026 - *Present*
- Peichun Hua, 2025 - *Present*
- Yizhuo Li, 2025 - *Present*
- Baocheng Geng, 2025 - *Present*

Mentoring (Before joining CUHK-Shenzhen)
- Mushtari Sadia (PhD student @ UMich): co-authored [C14]
- Archit Bhatnagar (PhD student @ UMich): co-authored [C16]
- Jiaheng Lu (undergraduate @ UMich → PhD sstudent @ UPenn): co-authored [C10]
- Suting Chen (undergraduate @ ShanghaiTech → PhD student @ Northwestern): co-authored [C12]
- Yibo Zhao (undergraduate @ ShanghaiTech → PhD student @ UMD): co-authored [C7]
- Yiwei Du (master student @ Rice University): co-authored [W2]
- Peizhi Liu (undergraduate → PhD student @ Northwestern) co-authored PDNS
- Ruijie Yu (master student @ Northwestern → software engineer @ Alibaba): co-authored PDNS
- Grayson Donnelly (undergraduate @ Northwestern): worked on extension of the Snatch project [C7]. He won the McCormick Summer Undergraduate Research Award in 2022.

PUBLICATIONS

(* Equal Contribution)

Conference Publications

■ [C17] **Y Xiao**, X Luo, Y Jiang, A Wang, H Chen, Z Zhou, H Yu, J Cao, Y Jiang, K Wang, M Xu, Y Chen, C Miao:
DDoS Detection at the Scale of One Hundred Tbps.
To appear in USENIX Symposium on Networked Systems Design and Implementation (*NSDI'26*).
(acceptance rate: 100/452=22.12%)

■ [C16] Archit Bhatnagar, **Yunming Xiao**, Ang Chen, Amrita Roy Chowdhury:
Secure Vickrey Auctions for Online Advertising.
To appear in USENIX Symposium on Networked Systems Design and Implementation (*NSDI'26*).
(acceptance rate: 100/452=22.12%)

■ [C15] C Miao, Z Yao, J Lv, J Wang, S Lin, X Zhang, **Y Xiao**, W Guo, J Bu, Y Wang, M Canini, G Xie:
Cost-effective and Reliable Global Internet Peering with Programmable Switches.
To appear in USENIX Symposium on Networked Systems Design and Implementation (*NSDI'26*).
(acceptance rate: 100/452=22.12%)

- [C14] Mushtari Sadia, Zhenning Yang, **Yunming Xiao**, Ang Chen, Amrita Roy Chowdhury:
SQUiD: Synthesizing Relational Databases from Unstructured Text.
In Conference on Empirical Methods in Natural Language Processing (*EMNLP'25*), Oral.
(24 pages, acceptance rate: 1811/8174=22.16%)

- [C13] Yibo Huang, Yiming Qiu, **Yunming Xiao**, Archit Bhatnagar, Sylvia Ratnasamy, Ang Chen:
Exposing RDMA NIC Resources for Software-Defined Scheduling.
In Asia-Pacific Workshop on Networking (*APNet'25*). (8 pages, acceptance rate: 34/133=25.6%)
Best Paper Award! (selection rate: 1/133=0.8%)

- [C12] Shihan Lin, Suting Chen, **Yunming Xiao**, Yanqi Gu, Aleksandar Kuzmanovic, Xiaowei Yang:
PreAcher: Secure and Practical Password Pre-Authentication by Content Delivery Networks.
In USENIX Symposium on Networked Systems Design and Implementation (*NSDI'25*).
(21 pages, acceptance rate: 55/401=13.7%)

- [C11] Y Liu*, **Y Xiao***, X Zhang, W Dang, H Liu, X Li, Z He, J Wang, A Kuzmanovic, A Chen, C Miao:
Unlocking ECMP Programmability for Precise Traffic Control.
In USENIX Symposium on Networked Systems Design and Implementation (*NSDI'25*).
(20 pages, acceptance rate: 55/401=13.7%)

- [C10] J Lu, **Y Xiao**, S Chakraborty, S Fu, Y Ji, A Chen, M Chowdhury, N Rao, S Ratnasamy, X Wang
OpenInfra: A Co-simulation Framework for the Infrastructure Nexus.
In Workshop on Hot Topics in System Infrastructure (*HotInfra'24*). (5 pages)

- [C9] C Miao*, Z Zhong*, **Y Xiao***, F Yang*, S Zhang*, C Lu, J Geng, Y Wang, X Zhou, Y Jiang, Z Bai, C Yang:
MegaTE: Extending WAN Traffic Engineering to Millions of Endpoints.
In Proceedings of ACM *SIGCOMM'24*. (14 pages, acceptance rate: 62/366=16.9%)

- [C8] **Y Xiao**, DZ Tootaghaj, A Dhakal, L Cao, P Sharma, A Kuzmanovic:
Conspirator: SmartNIC-Aided Control Plane for Distributed ML Workloads.
In Proceedings of USENIX Annual Technical Conference (*ATC'24*).
(19 pages, acceptance rate: 77/482=16.0%)

- [C7] **Yunming Xiao**, Yibo Zhao, Sen Lin, Aleksandar Kuzmanovic:
Snatch: Online Streaming Analytics at the Network Edge.
In Proceedings of the ACM European Conference on Computer Systems (*EuroSys'24*).
(21 pages, acceptance rate: 39/244=16.0%)
Best Student Paper Award! (selection rate: 1/244=0.4%)

- [C6] C Miao*, **Y Xiao***, M Canini, R Dai, S Zheng, J Wang, J Bu, A Kuzmanovic, Y Wang:
TENSOR: Lightweight BGP Non-Stop Routing.
In Proceedings of ACM *SIGCOMM'23*. (14 pages, acceptance rate: 73/325=22.5%)

- [C5] **Yunming Xiao**, Matteo Varvello:
FIAT: Frictionless Authentication of IoT Traffic.
In Proceedings of ACM Conference on Emerging Network Experiment and Technology (*CoNEXT'22*).
(15 pages, acceptance rate: 29/151=19.2%)

- [C4] **Yunming Xiao**, Sarit Markovich, Aleksandar Kuzmanovic:
Blockchain Mining: Optimal Resource Allocation.
In Proceedings of ACM Advances in Financial Technologies (*AFT'22*).
(14 pages, acceptance rate: 23/79=29.1%)

- [C3] **Yunming Xiao**, Matteo Varvello, Aleksandar Kuzmanovic:
  Monetizing Spare Bandwidth: the Case of Distributed VPNs.
  In Proceedings of the ACM on Measurement and Analysis of Computing Systems (*SIGMETRICS'22*).
  (27 pages, acceptance rate: 13/122=10.7%)

- [C2] Marc Anthony Warrior, **Yunming Xiao**, Matteo Varvello, Aleksandar Kuzmanovic:
  De-Kodi: Understanding the Kodi Ecosystem.
  In Proceedings of The Web Conference 2020 *(WWW'20)*.
  (11 pages, acceptance rate: 357/1736=20.6%)

- [C1] **Yunming Xiao**, Haifeng Sun, Zirui Zhuang, Jingyu Wang, Qi Qi:
  Common Knowledge Based Transfer Learning for Traffic Classification.
  IEEE 43rd Conference on Local Computer Networks *(LCN'18)*. (4 pages)

Journal Publications

- [J8] Z Yang, A Bhatnagar, Y Qiu, T Miao, PTJ Kon, **Y Xiao**, Y Huang, M Casado, A Chen:
  Cloud Infrastructure Management in the Age of AI Agents.
  ACM SIGOPS Operating Systems Review (OSR), 59(2), pp. 1-8. 2025.

- [J7] **Yunming Xiao**, Yanqi Gu, Yibo Zhao, Sen Lin, Aleksandar Kuzmanovic:
  Enabling Anonymous Online Streaming Analytics at the Network Edge.
  ACM Transactions on Computer Systems (TOCS). 43(4), pp. 1-39, 2025.

- [J6] **Yunming Xiao**, Matteo Varvello, Marc Anthony Warrior, Aleksandar Kuzmanovic:
  Decoding the Kodi Ecosystem.
  ACM Transactions on the Web *(TWEB)*, 17(1), pp.1-36. 2023.

- [J5] P Wang, Z Wei, D Zhou, W Song, **Y Xiao**, G Sun, S Yu, Q Zhang:
  A Survey on Federated Unlearning.
  Chinese Journal of Computers, 47(2), pp. 396-422. 2023.

- [J4] P Wang, Z Wei, H Qi, S Wan, **Y Xiao**, G Sun, Q Zhang:
  Mitigating Poor Data Quality Impact with Federated Unlearning for Human-Centric Metaverse.
  IEEE Journal on Selected Areas in Communications *(JSAC)*, 42(4), pp. 832-849. 2023.

- [J3] Aritra Dutta, El Houcine Bergou, **Yunming Xiao**, Marco Canini, Peter Richtárik:
  Direct Nonlinear Acceleration.
  EURO Journal on Computational Optimization, 10, 100047 (26 pages). 2022.

- [J2] P Wang, Y Zhao, MS Obaidat, Z Wei, H Qi, C Lin, **Y Xiao**, Q Zhang:
  Blockchain-Enhanced Federated Learning Market with Social Internet of Things.
  IEEE Journal on Selected Areas in Communications *(JSAC)*, 40(12), pp. 3405-3421. 2022.

- [J1] **Yunming Xiao**, Bin Wu:
  Close spatial arrangement of mutants favors and disfavors fixation.
  PLoS Computational Biology, 15(9), e1007212 (20 pages). 2019.

PATENTS

[P4] Diman Zad Tootaghaj, **Yunming Xiao**, Aditya Dhakal, Puneet Sharma:
Job Allocations to Fractions of Parallel Processing Units.
Filed on June 2024.

[P3] Diman Zad Tootaghaj, **Yunming Xiao**, Aditya Dhakal, Puneet Sharma:
DMA Transfers of Job Data From an Adapter to Parallel Processing Unit Fractions.
Filed on June 2024.

[P2] **Yunming Xiao**, Diman Zad Tootaghaj, Aditya Dhakal, Puneet Sharma:
Smart Network Interface Card Control Plane for Distributed Machine Learning Workloads.
US 18/460,043. March 2025.

[P1] Diman Zad Tootaghaj, **Yunming Xiao**, Aditya Dhakal, Puneet Sharma:
Job Allocations To Graphics Processing Units With Tenant Isolation.
US 18/299,855. October 2024.

GRANTS

PI, National Key Lab of Internet Architecture at Tsinghua University, Open Project: "Efficient and Trustworthy Retrieval Framework for Retrieval-Augmented Generation with Large Models." 100K RMB, 2026–2027.

Co-lead the development of NSF grant CNS-2310927: "Privacy-Preserving and Censorship-Resistant Domain Name System" ($750K, PI: Aleksandar Kuzmanovic, Co-PI: Xiao Wang).

Co-lead the development of NSF grant CNS-2226107: "Enabling Streaming Analytics at the Network Edge" ($400K, PI: Aleksandar Kuzmanovic).

INVITED & CONFERENCE TALKS

"Fine-Grained Traffic Scheduling: A Systemic Design from Local Server to WAN"
Nanjing University, Nanjing & Suzhou, China, November 2025.
"Exposing RDMA NIC Resources for Software-Defined Scheduling"
APNet, Shanghai, China, August 2025.
"Renovating CDN for Improved Security and Privacy"
Fudan University, Shanghai, China, August 2025.
Institute of Software, Chinese Academy of Sciences, Beijing, China, July 2025.
"Unlocking ECMP Programmability for Precise Traffic Control"
USENIX NSDI'25, Philadelphia, PA, April 2025.
University of Maryland, College Park, MD, April 2025.
"Renovating Internet Services and Infrastructures to Empower End Users"
Hong Kong University of Science and Technology, Guangzhou, China (Remote), March 2025.
Chinese University of Hong Kong, Shenzhen, China (Remote), February 2025.
NYU Shanghai, Shanghai, China (Remote), February 2025.
Singapore University of Technology and Design, Singapore (Remote), February 2025.
UM-SJTU Joint Institute, Shanghai Jiao Tong University, Shanghai, China (Remote), December 2024.
"Snatch: Online Streaming Analytics at the Network Edge"
Duke University, Remote, November 2024.
ACM EuroSys, Athens, Greece (Remote), April 2024.
"Conspirator: SmartNIC-Aided Control Plane for Distributed ML Workloads"
USENIX ATC'24, Santa Clara, CA, July 2024.
Hewlett Packard Labs, Milpitas, CA (Remote), July 2024.
"Renovating Internet Services: Towards a Secure, Private, and Reliable Web"
University of Texas at Arlington, March 2024.
The University of Houston, February 2024.
HKUST-GZ, Guangzhou, China (Remote), January 2024.
Rice University, Houston, TX, November 2023.
"TENSOR: Lightweight BGP Non-Stop Routing"
Illinois Institute of Technology, Chicago, IL, October 2023.
ACM SIGCOMM'23, New York City, NY, September 2023.
"FIAT: Frictionless Authentication of IoT Traffic"
ACM CoNEXT'22, Rome, Italy (Remote), December 2022.
Nokia Bell Labs, Murray Hill, NJ, November 2022.

"Monetizing Spare Bandwidth: The Case of Distributed VPNs"
ACM SIGMETRICS'22, Mumbai, India (Remote), June 2022.

SERVICE

Panels

NSF CISE CNS Program Panelist and Reviewer: 2025

Organizing Committee

Asia-Pacific Workshop on Networking (APNet), Publication Chair, 2026

Program Committee Member

ACM SIGCOMM : 2026
IEEE Symposium on Security and Privacy (Oakland): 2026
ACM Conference on Computer and Communications Security (CCS): 2025, 2026
ACM ASPLOS: 2026 (ERC)
ACM Internet Measurement Conference (IMC): 2026
The Conference on Machine Learning and Systems (MLSys): 2026 (ERC)
Privacy Enhancing Technologies Symposium (PETS/PoPETs): 2025, 2026
SIGOPS Asia-Pacific Workshop on Systems (APSys): 2025
Asia-Pacific Workshop on Networking (APNet): 2025
USENIX Security, Artifact Evaluation: 2025
ACM SIGCOMM, Artifact Evaluation: 2022, 2023
ACM Symposium on Operating Systems Principles (SOSP), Artifact Evaluation: 2023

Reviewer

USENIX Annual Technical Conference (ATC) 2025
IEEE Transactions on Dependable and Secure Computing (TDSC)
ACM SIGCOMM Computer Communication Review (CCR)
IEEE Journal on Selected Areas in Communications (JSAC)
Journal of Systems Architecture (JSA)
IEEE Transactions on Sustainable Computing