Yunming Xiao

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RESEARCH INTERESTS

I am broadly interested in computer systems and networks. My current research focuses on enhancing the security, privacy, and reliability of Internet services and 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, Shenzhen, China   (Incoming) From Jul 2025
Assistant Professor, School of Data Sciences

University of Michigan, Ann Arbor, MI   Jun 2024 - *Present*
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
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*

GRANTS AND AWARDS

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).

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

PUBLICATIONS

(* Equal Contribution)

Conference Publications

- [C12] Shihan Lin, Suting Chen, **Yunming Xiao**, Yanqi Gu, Aleksandar Kuzmanovic, Xiaowei Yang:
  PreAcher: Secure and Practical Password Pre-Authentication by Content Delivery Networks.
  To appear 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.
  To appear 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

■ [J5] **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.

■ [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.

Refereed Demos/Posters

■ [D4] **Yunming Xiao**, Mushtari Sadia, Ang Chen:
Multi-modal Swarm Intelligence for Secure UAV Missions.
GENZERO 2024 Workshop.

■ [D3] **Yunming Xiao**, Chenkai Weng, Ruijie Yu, Peizhi Liu, Matteo Varvello, Aleksandar Kuzmanovic:
Demo: PDNS: A Fully Privacy-Preserving DNS.
In Proceedings of *SIGCOMM'23*.

■ [D2] **Yunming Xiao**, Matteo Varvello:
FIAT: Frictionless Authentication of IoT Traffic.
In Proceedings of ACM *CoNEXT'21*.

■ [D1] **Yunming Xiao**, Matteo Varvello, Aleksandar Kuzmanovic:
A First Look Into Distributed VPNs.
In the 21st ACM Internet Measurement Conference *(IMC'21)*.

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:
Conspirator: A SmartNlC Aided Control Plane for Distributed Machine Learning Workloads.
Filed on September 2023.

[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.

TEACHING AND MENTORING EXPERIENCE

Teaching

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

Mentoring

- Mushtari Sadia (PhD student @ UMich): co-authored [D4], working on the extension
- Archit Bhatnagar (PhD student @ UMich): working on a privacy-preserving advertisement system project
- Jiaheng Lu (undergraduate @ UMich): co-authored [C10], working on the extension
- Suting Chen (undergraduate @ ShanghaiTech → PhD student @ Northwestern): co-authored [W6]
- 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 [D3] and [W1]
- Ruijie Yu (master student @ Northwestern → software engineer @ Alibaba): co-authored [D3] and [W1]
- Grayson Donnelly (undergraduate @ Northwestern): worked on extension of the Snatch project [C7]. He won the McCormick Summer Undergraduate Research Award in 2022.

INVITED & CONFERENCE TALKS

"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 Networking Technology and Systems (NeTS) Program Panelist and Reviewer: 2025
Program Committee Member
IEEE Symposium on Security and Privacy (Oakland): 2026
ACM Conference on Computer and Communications Security (CCS): 2025
Privacy Enhancing Technologies Symposium (PETS/PoPETs): 2025
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
External Review Committee Member
ACM ASPLOS: 2026
Reviewer
ACM SIGCOMM Computer Communication Review (CCR)
IEEE Journal on Selected Areas in Communications (JSAC)
Journal of Systems Architecture (JSA)
IEEE Transactions on Sustainable Computing