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RESEARCH Network and Information Security

INTERESTS Decentralized Systems
Trusted and Privacy-preserving Computing
Mobile Communications and Network Security
Cyber-Physical Security

PROFESSIONAL **Assistant Professor** 08/2022 – Present

APPOINTMENT Department of Computer Science, University of Kentucky, KY, USA

Graduate Research Assistant 08/2017 – 05/2022

Department of Electrical and Computer Engineering, Virginia Tech, VA, USA

Research Intern 05/2016 – 08/2016

Mathematics and Modeling Department, Schlumberger-Doll Research, MA, USA

EDUCATION **Virginia Polytechnic Institute and State University**, VA, USA 08/2017 – 05/2022

– Ph.D. in Computer Engineering

University of Michigan, MI, USA 09/2015 – 04/2017

– M.S. in Electrical Engineering-Systems

Shanghai Jiao Tong University, Shanghai, China 09/2010 – 06/2014

– B.S.E. in Information Engineering

– (Secondary) B.Econ. in Finance

CONFERENCE (underlined: student directly supervised; *: I am the corresponding author.)

PUBLICATIONS

[1] Closing the Visibility Gap: A Monitoring Framework for Verifiable Open RAN Operations

H. Yu, M. M. Al Barat, **Y. Xiao**, Y. T. Hou, W. Lou

IEEE Conference on Communications and Network Security 2025 (**CNS'25**), September 2025.

[2] Scale-MIA: A Scalable Model Inversion Attack against Secure Federated Learning via Latent Space Reconstruction

S. Shi, N. Wang, **Y. Xiao**, C. Zhang, Y. Shi, Y. T. Hou, W. Lou

Network and Distributed System Security Symposium 2025 (**NDSS'25**), February 2025.

[3] TriSAS: Toward Dependable Inter-SAS Coordination with Auditability

S. Shi, **Y. Xiao**, C. Du, Y. Shi, C. Wang, R. Gazda, Y. T. Hou, E. Burger, L. DaSilva, W. Lou

19th ACM ASIA Conference on Computer and Communications Security (**ASIACCS'24**), July 2024.

[4] AAKA: An Anti-Tracking Cellular Authentication Scheme Leveraging Anonymous Credentials

H. Yu, C. Du, **Y. Xiao**, A. Keromytis, C. Wang, R. Gazda, Y. T. Hou, W. Lou

Network and Distributed System Security Symposium 2024 (**NDSS'24**), February 2024.

[5] Rethinking Single Sign-On: A Reliable and Privacy-Preserving Alternative with Verifiable Credentials

A. D. Johnson, I. Alom, **Y. Xiao***

10th ACM Workshop on Moving Target Defense (**MTD**), November 2023. (Collocated with CCS 2023)

[6] Bijack: Breaking Bitcoin Network with TCP Vulnerabilities

S. Li, S. Shi, **Y. Xiao**, C. Zhang, Y. T. Hou, W. Lou

28th European Symposium on Research in Computer Security (**ESORICS'23**), September 2023.

- [7] UCBlocker: Unwanted Call Blocking Using Anonymous Authentication
C. Du, H. Yu, **Y. Xiao**, Y. T. Hou, A. Keromytis, W. Lou
32nd USENIX Security Symposium (**USENIX Security'23**), August 2023.
- [8] ARI: Attestation of Real-time Mission Execution Integrity
J. Wang, Y. Wang, A. Li, **Y. Xiao**, R. Zhang, W. Lou, Y. Hou, N. Zhang
USENIX Security Symposium (**USENIX Security'23**), August 2023.
- [9] MS-PTP: Protecting Network Timing from Byzantine Attacks
S. Shi, **Y. Xiao**, C. Du, M. Shahriar, A. Li, N. Zhang, Y. Hou, W. Lou
16th ACM Conference on Security and Privacy in Wireless and Mobile Networks (**WiSec'23**), May 2023.
- [10] A Decentralized Truth Discovery Approach to the Blockchain Oracle Problem
Y. Xiao, N. Zhang, W. Lou, Y. T. Hou
IEEE Conference on Computer Communications 2023 (**INFOCOM'23**), May 2023.
- [11] Squeezing More Utility via Adaptive Clipping on Differentially Private Gradients in Federated Meta-Learning
N. Wang, **Y. Xiao**, Y. Chen, N. Zhang, W. Lou, Y. T. Hou
38th Annual Computer Security Applications Conference (**ACSAC'22**), December 2022.
- [12] Mobile Tracking in 5G and Beyond Networks: Problems, Challenges, and New Directions
C. Du, H. Yu, **Y. Xiao**, W. Lou, C. Wang, R. Gazda, Y. T. Hou
19th IEEE International Conference on Mobile Ad-Hoc and Smart Systems (**MASS'22**), October 2022.
- [13] CANShield: Signal-based Intrusion Detection for Controller Area Networks
M. H. Shahriar, **Y. Xiao**, P. Moriano, W. Lou, Y. T. Hou
9th Embedded Security in Cars USA conference (**escar USA'22**), June 2022.
- [14] FLARE: Defending Federated Learning against Model Poisoning Attacks via Latent Space Representations
N. Wang, **Y. Xiao**, Y. Chen, Y. Hu, W. Lou, Y. T. Hou
17th ACM ASIA Conference on Computer and Communications Security (**ASIACCS'22**), May 2022.
- [15] Session Key Distribution Made Practical for CAN and CAN-FD Message Authentication
Y. Xiao, S. Shi, N. Zhang, W. Lou, Y. T. Hou
36th Annual Computer Security Applications Conference (**ACSAC'20**), December 2020.
- [16] PrivacyGuard: Enforcing Private Data Usage Control with Blockchain and Off-chain Contract Execution
Y. Xiao, N. Zhang, J. Li, W. Lou, Y. T. Hou
25th European Symposium on Research in Computer Security (**ESORICS'20**), September 2020.
- [17] Modeling the Impact of Network Connectivity on Consensus Security of Proof-of-Work Blockchain
Y. Xiao, N. Zhang, W. Lou, Y. T. Hou
IEEE International Conference on Computer Communications 2020 (**INFOCOM'20**), July 2020.

BOOK
CHAPTERS

- [1] Basic Proof-of-Stake Consensus Mechanisms
Y. Xiao*, W. Sun
Proof-of-Stake for Blockchain Networks: Fundamentals, challenges and approaches, IET, 2024
- [2] Distributed Consensus Protocols and Algorithms
Y. Xiao, N. Zhang, J. Li, W. Lou, Y. T. Hou
Blockchain for Distributed Systems Security, Wiley & Sons, 2019

JOURNAL
PUBLICATIONS

(underlined: student directly supervised; *: I am the corresponding author.)

- [1] DEXO: A Verifiable and Scalable Oracle Mechanism for Inter-DApp Data Exchange.
Y. Li, I. Alom, W. Sun, **Y. Xiao***
In *IEEE Internet of Things Journal (IOT-J)*, June 2025.
- [2] CANShield: Deep Learning-Based Intrusion Detection Framework for Controller Area Networks at the Signal-Level
M. H. Shahriar, **Y. Xiao**, P. Moriano, W. Lou, Y. T. Hou
In *IEEE Internet of Things Journal (IOT-J)*, December 2023.
- [3] BD-SAS: Enabling Dynamic Spectrum Sharing in Low-trust Environment
Y. Xiao, S. Shi, W. Lou, C. Wang, X. Li, N. Zhang, Y. T. Hou, J. H. Reed
In *IEEE Transactions on Cognitive Communications and Networking (TCCN)*, 2023.
- [4] SofitMix: A Secure Offchain-Supported Bitcoin-Compatible Mixing Protocol
H. Xie, S. Fei, Z. Yan, **Y. Xiao**
In *IEEE Transactions on Dependable and Secure Computing (TDSC)*, 2022.
- [5] MANDA: On Adversarial Example Detection for Network Intrusion Detection System
N. Wang, Y. Chen, **Y. Xiao**, Y. Hu, W. Lou, Y. T. Hou
In *IEEE Transactions on Dependable and Secure Computing (TDSC)*, 2022.
- [6] Decentralized Spectrum Access System: Vision, Challenges, and a Blockchain Solution
Y. Xiao, S. Shi, W. Lou, C. Wang, X. Li, N. Zhang, Y. T. Hou, J. H. Reed
In *IEEE Wireless Communications*, 2022.
- [7] Challenges and New Directions in Securing Spectrum Access Systems
S. Shi, **Y. Xiao**, W. Lou, C. Wang, X. Li, Y. T. Hou, J. H. Reed
In *IEEE Internet of Things Journal (IOT-J)*, 2021.
- [8] A Survey of Distributed Consensus Protocols for Blockchain Networks
Y. Xiao, N. Zhang, W. Lou, Y. T. Hou
In *IEEE Communications Surveys & Tutorials (COMST)*, 2020.
- [9] Offloading Decision in Edge Computing for Continuous Applications Under Uncertainty
W. Chang, **Y. Xiao**, W. Lou, G. Shou
In *IEEE Transactions on Wireless Communications (TWC)*, 2020.
- [10] Performance Analysis of Random Access Network with Post-backoff
C. Bu, **Y. Xiao**, T. Ye, P. Wu, X. Zhang, J. Wu
In *Telecommunications Science*, 2016.

TALKS,	Distributed Consensus Protocols for Blockchain	
INTERVIEWS	– Invited virtual talk, <i>IEMS 5725 Blockchain and Applications</i> , CUHK	4/2024
	On Mobile Network Security	
	– Invited talk on mobile tracking and authentication, UK CyberCon'24	10/2024
	– TV interviews on the anti-tracking mobile network project, UK Now and LEX 18	12/2023
	– TV interview on mobile apps security for online sports betting, Fox 56	10/2023
	Blockchain and Trusted Execution Environment: Security Properties, Synergies, Applications	
	– Invited talk, <i>Delta 2022 Cybersecurity Conference, UTN Facultad Regional Delta, Argentina</i>	11/2022
	A Layered View towards Blockchain: From Consensus Security to Smart Contract Application	
	– Invited talk, <i>CS Graduate Seminars</i> , Virginia Tech	11/2020
WORKSHOPS,	Session Key Distribution Made Practical for CAN and CAN-FD Message Authentication	
POSTERS	– Workshop talk, <i>Learning from Authoritative Security Experiment Results (LASER) Workshop</i>	12/2020
	Enforcing Private Data Usage Control with Blockchain and Attested Off-chain Contract Execution	

- Poster, 2019 SaTC PI Meeting, NSF, Alexandria, VA 04/2019
- A Graph Random-Walk Based Sampling Algorithm for Load Balancing in Cloud Systems
- Poster, *6th Midwest Workshop on Control and Game Theory*, Ann Arbor, MI 04/2017

GRANTS

US National Science Foundation

- “CAREER: Foundations of Operational Resilience and Secure Communication for Networked Real-Time Systems,” NSF Award #2442382, 07/15/2025–06/30/2030, \$534,264 (PI, sole)
- “Collaborative Research: A Novel Architecture for Secure and Adaptive Spectrum Management Enabling Registration-Free Federal Users,” NSF Award #2433905, 09/01/2025–08/31/2028, \$237,500 (PI, non-lead)
- “Collaborative Research: SaTC: CORE: Medium: An Anti-tracking and Robocall-free Architecture for Next-G Mobile Networks,” NSF Award #2247561, 05/01/2023–04/30/2027, \$300,000 (PI, non-lead)

Office of Naval Research

- “Byzantine Resilient Federated Learning in Sporadically Connected Wireless Networks, ONR Award #N00014-24-1-2730, subawarded through Virginia Tech, 10/01/2024–09/30/2027, \$300,000 (Co-PI)

TEACHING

Instructor, University of Kentucky

- CS 270: Systems Programming Fall 2025
- CS 371: Introduction to Computer Networking Spring 2023, 2024
- CS 378: Introduction to Cryptology Spring 2025
- CS 572: Network Security Fall 2023, 2024
- CS 585/685: Intermediate/Special Topics in CS: Blockchain Technologies Fall 2022

Guest Lecturer, Virginia Tech

- CS 5560: Fundamentals of Information Security - Cryptocurrency & Blockchain Spring 2019

Graduate Teaching Assistant, Virginia Tech

- ECE 2534: Microcontroller Programming and Interfacing Fall 2017

ADVISING

PhD Students

- Yue Li University of Kentucky, 08/2023 - Now
- Ifteher Alom University of Kentucky, 08/2023 - Now
- Sudip Bhujel University of Kentucky, 08/2024 - Now

Master Students

- Yue Li University of Kentucky, 12/2022 - 05/2023

Undergrad Students

(EURF: Engineering Undergraduate Research Fellow; REU: NSF Research Experiences for Undergraduates)

- Cameron Lira (EURF) University of Kentucky, 05/2025 - 08/2023
- John Hostettler (REU) University of Kentucky, 05/2025 - 07/2023
- Gavin Prewitt (REU) University of Kentucky, 05/2025 - 07/2023
- Athan Johnson (EURF) University of Kentucky, 05/2023 - 09/2023
- William Rillo (Lab Assistant) University of Kentucky, 01/2025 - 05/2025

PhD Advisory Committee

- Xu Tao University of Kentucky, 04/2023 – Now
- Yuhang Jiang University of Kentucky, 03/2023 – Now

Master Advisory Committee

- Jacob Sobota University of Kentucky, 03/2023 – 04/2023
- Franklin Stokan University of Kentucky, 02/2023 – 04/2023
- Samuel Armstrong University of Kentucky, 10/2022 – 03/2023

ACADEMIC SERVICES	Conference Organization	
	<ul style="list-style-type: none"> – IEEE International Conference on Computer Communications (INFOCOM) 2023, 2024: Web Chair – IEEE Conference on Communications and Network Security (CNS) 2020: Web Chair 	
	Technical Program Committee	
	– Network and Distributed System Security (NDSS) Symposium	2026
	– Annual Computer Security Applications Conference (ACSAC)	2024,2025
	– IEEE International Conference on Computer Communications (INFOCOM)	2024,2025
	– IEEE Military Communications Conference (MILCOM)	2023-2025
	– International Conference on Computer Communications and Networks (ICCCN)	2023
	Panelist	
	– NSF Panelist	2023
	– NSF SaTC PI Meeting Undergraduate Track - Student Panelist	2019
	Journal Review	
	– IEEE/ACM Transactions on Networking (TON)	
	– IEEE Internet of Things Journal (IOT-J)	
	– IEEE Transactions on Dependable and Secure Computing (TDSC)	
	– IEEE Transactions on Information Forensics and Security (TIFS)	
	– IEEE Transactions on Communications (TCOM)	
	– IEEE Transactions on Computers (TC)	
	– ACM Transactions on Privacy and Security (TOPS)	
	– International Journal of Intelligent Systems (INT2)	
	– ACM Transactions on Cyber-Physical Systems (TCPS)	
	Conference Review	
	– EAI International Conference on Security and Privacy in Comm. Netw. (SecureComm)	2019
	– IEEE International Conference on Computer Communications (INFOCOM)	2021
	– IEEE International Conference on Sensing, Communication, and Networking (SECON)	2022
	– IEEE Symposium on Security and Privacy (Oakland)	2023
	– European Symposium on Research in Computer Security (ESORICS)	2023
UNIVERSITY SERVICES	Department of Computer Science, University of Kentucky	
	<ul style="list-style-type: none"> – Committee on Higher Degrees – Hiring Committee – Faculty Member, Cybersecurity Certificate Program 	09/2022 - 08/2024 09/2024 - Now 04/2023 - Now
AWARDS	Distinguished Member of the INFOCOM 2024 Technical Program Committee	2024
	– Awarded by the INFOCOM 2024 organizing committee	
	INFOCOM 2020 Student Travel Grant	2020
	– Awarded by the INFOCOM 2020 organizing committee	
	BitShares Graduate Fellowship	2019
	– Awarded by Virginia Tech CS Department, funded by BitShares Inc.	
	Completion of the Elite Engineer Cultivation Program in Information Engineering	2014
	– Certified by Shanghai Jiao Tong University	
	First Prize in the 28th National Physics Contest of College Students (Shanghai Division)	2011
	– Awarded by Shanghai Physics Society	
PROFESSIONAL MEMBERSHIPS	– IEEE Member, Communications Society, Computer Society	11/2017 – Present
	– ACM Professional Member	10/2020 – Present

