Xiaochan Xue, Ph.D.

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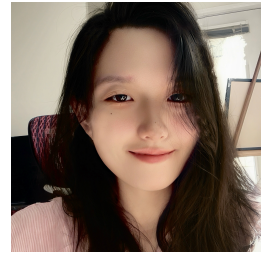🔗 LinkdIn
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Summary

I am an **Assistant Professor** of Electrical and Computer Engineering at the University of Hawaiʻi at Mānoa.

My research centers on **cybersecurity** and **wireless integrated sensing and communication (ISAC)** across 5G, Sub-6GHz, Next-G, and Open Radio Access Network (O-RAN) technologies. I focus on developing **secure**, **ultra-reliable**, and **intelligent wireless systems** by leveraging **applied artificial intelligence (AI)** to enable privacy-preserving, real-time, and adaptive cyber-physical systems (CPS) with applications in *healthcare*, *smart cities*, and beyond.

Recognized for my academic and professional achievements, I was awarded the **Excellence Doctoral Fellowship (2023–2024)** and named a **2025 NSF CPS Rising Star**.

I am dedicated to advancing **secure and resilient wireless technologies** through both theoretical innovation and practical implementation.

Employment History

2025 – Present	🔖 **Assistant Professor.** University of Hawaii at Manoa, Collage of Engineering, Department of Electrical and Computer Engineering.
2024 – 2025	🔖 **Lecturer.** Stevens Institute of Technology, Department of Electrical and Computer Engineering.

Education

2020 – 2025	🔖 **Ph.D., Computer Engineering,** Stevens Institute of Technology *Department of Electrical and Computer Engineering*
2018 – 2019	🔖 **M.S., Electrical Engineering,** Stevens Institute of Technology *Department of Electrical and Computer Engineering*
2013 – 2017	🔖 **B.E., Communication Engineering,** Jilin University *Department of Communication Engineering*

Miscellaneous Experience

Awards and Achievements

02/2025	🔖 **NSF CPS Rising Star**, Vanderbilt University (Nashville, TN)
2023–2024	🔖 **Excellence Doctoral Fellowship**, Stevens Institute of Technology
	🔖 **Graduate Conference Fund**, Stevens Institute of Technology
2019–2020	🔖 **Research Assistantship**, Stevens Institute of Technology (Master Degree)
10/2016	🔖 **Third Class Scholarship**, Jilin University
	🔖 **Outstanding Student Leader**, Jilin University
10/2015	🔖 **Excellent Student Award in College**, Jilin University

Research Publications

Conference Proceedings

1 X. Xue, S. Yu, S. Parkar, and J. Li, "Waveform design for ISAC: Trends and future directions," in *Proceedings of the 2026 International Conference on Computing, Networking and Communications (ICNC)*, to appear, Maui, HI, USA: IEEE, Feb. 2026. 🔗 URL: http://www.conf-icnc.org/2026/.

2 X. Xue, S. R. Parkar, S. Yu, and Y. Zheng, "AI-assisted Composite ISAC for mmWave Respiration Pattern Recognition," in *2025 IEEE Annual Congress on Artificial Intelligence of Things (AIoT)*, Accepted, 2025.

3 X. Xue, S. Yu, S. R. Parkar, and Y. Zheng, "ROISD: RIS and O-RAN Assisted Intelligent Sensing for UAV Detection," in *2025 IEEE Annual Congress on Artificial Intelligence of Things (AIoT)*, Accepted, 2025.

4 X. Xue, M. K. Hasan, S. Yu, L. N. Kandel, and M. Song, "Over-the-Air Federated Learning with Enhanced Privacy," in *ICC 2023 - IEEE International Conference on Communications*, 2023, pp. 4546–4551. 🔗 DOI: 10.1109/ICC45041.2023.10278765.

5 X. Xue, S. Yu, and M. Song, "Secure Device Trust Bootstrapping Against Collaborative Signal Modification Attacks," in *IEEE INFOCOM 2023 - IEEE Conference on Computer Communications*, 2023, pp. 1–10. 🔗 DOI: 10.1109/INFOCOM53939.2023.10229007.

6 X. Xue, S. Yu, M. Song, and C. Xin, "K-Group Random Channel Hopping (K-RCH) Rendezvous for Cognitive Radio Networks," in *ICC 2021 - IEEE International Conference on Communications*, 2021, pp. 1–6. 🔗 DOI: 10.1109/ICC42927.2021.9500643.

7 H. Wu, Y. Zou, J. Zhu, X. Xue, and T. Tsiftsis, "Secrecy Performance of Hybrid Satellite-Terrestrial Relay Systems with Hardware Impairments," in *ICC 2019 - 2019 IEEE International Conference on Communications (ICC)*, 2019, pp. 1–6. 🔗 DOI: 10.1109/ICC.2019.8761231.

Journal Articles

1 M. K. Hasan, X. Xue, S. Yu, and M. Song, "Cooperative NOMA-Based Spectrum Leasing with Multiple Secondary Users," *IEEE Transactions on Vehicular Technology*, vol. 72, no. 11, pp. 14 543–14 558, 2023. 🔗 DOI: 10.1109/TVT.2023.3287230.

Presentations and Seminars

Presentations

06/2021	🔖 X. Xue, S. Yu, M. Song and C. Xin, *"K-Group Random Channel Hopping (K-RCH) Rendezvous for Cognitive Radio Networks"*, virtual due to COVID. (Invited oral presentation on conference paper)
05/2023	🔖 X. Xue, M. K. Hasan, S. Yu, L. N. Kandel, and M. Song, *"Over-the-Air Federated Learning with Enhanced Privacy"*, Rome, Italy. (Invited oral presentation on conference paper)
	🔖 X. Xue, S. Yu and M. Song, *"Secure Device Trust Bootstrapping Against Collaborative Signal Modification Attacks"*, New York area, USA. (Invited oral presentation on conference paper)
08/2024	🔖 X. Xue, S. Yu and M. Song, *"Secure Device Trust Bootstrapping Against Collaborative Signal Modification Attacks"*, 1st Symposium on Emerging Topics in Networks, Systems, and Cybersecurity, Stevens Institute of Technology, NJ, USA. (Poster presentation)

Presentations and Seminars (continued)

02/2025   ◾   X. Xue, S. Yu, *"AI-Driven Integrated Sensing and Communication (ISAC) in AI-RAN/O-RAN: Scalability, Privacy, and Security"*, NSF CPS Rising Star Workshop, Nashville, TN, USA. (Poster, 17% acceptance rate)

04/2025   ◾   X. Xue, S. Yu, *"AI-Driven Integrated Sensing and Communication (ISAC) in AI-RAN/O-RAN: Scalability, Privacy, and Security"*, Stevens Institute of Technology ECE Department Research Expo, NJ, USA. (Poster presentation)

Seminar

02/2025   ◾   X. Xue, *"Enhancing Security and Privacy in Distributed Wireless Networks Through Physical Layer Techniques"*, Stevens Institute of Technology, NJ, USA. (Invited oral seminar)

Teaching Experience

2026 Spring   ◾   **Instructor.** University of Hawaii at Manoa
Course: ECE 362: Discrete Math for Engineers.

◾   **Instructor.** University of Hawaii at Manoa
Course: ECE 669: Wireless and Mobile Security.

2025 Fall   ◾   **Instructor.** University of Hawaii at Manoa
Course: ECE 693E: Intelligent and Secure Wireless Networks.
From Wireless Fundamentals to intelligent, secure, and programmable AI-driven Radio Access Networks.

2024 – 2025   ◾   **Instructor.** Stevens Institute of Technology (During Doctoral Degree)
Course: Information System Security (Graduate Level, On-site & WebCampus).
Designed and delivered course content covering cybersecurity fundamentals, network security, cryptography, and system vulnerabilities.
Developed hands-on assignments and projects to help students understand secure communication protocols, authentication mechanisms, and emerging threats.

2020 – 2023   ◾   **Teaching Assistant.** Stevens Institute of Technology (During Doctoral Degree)
Course: Applied Machine Learning (Graduate Level).
Supported course instruction by designing assignments, mentoring students during office hours, and guiding them through supervised/unsupervised learning and neural network techniques.
Course: Engineering Design IV (Undergraduate Level).
Instructed this senior design laboratory course, mentoring undergraduates in developing design skills and engineering judgment through design projects in communication, control systems, signal processing, and MATLAB-based simulations.

2018 – 2019   ◾   **Grader.** Stevens Institute of Technology (During Master's Degree)
Course: Applied Machine Learning (Graduate Level).
Course: Linear System Theory (Graduate Level).

Research Experience

01/2022 – Present	**Research Assistant.** Stevens Institute of Technology, AISecLab Advisor: Prof. Shucheng Yu

Project: Physical Layer Security in Wireless Networks for Distributed Devices
– Developed a novel trust bootstrapping protocol to mitigate collaborative RF signal modification attacks without additional hardware.
– Designed lightweight, scalable PLS-based confidential computing techniques for federated learning (FL) and multi-device collaboration, including a pairwise cancellable random artificial noise (PCR-AN) scheme for AirComp-based FL.
– Conducted theoretical analysis and experimental validation to ensure security, privacy, and FL convergence.

Project: mmWave Sensing & Integrated Sensing and Communication (ISAC)
– Built an AI-driven sensing system for contactless breathing pattern detection using mmWave FMCW radar, achieving high real-world detection accuracy.
– Implemented OFDM-based respiration sensing and explored neural network integration for data processing and pattern recognition.

Project: Wireless Sensing in O-RAN with Security & AI (Ongoing)
– Designing wireless sensing applications for distributed learning under O-RAN.
– Developing Generative AI-integrated ISAC in AI-RAN/O-RAN to enhance cyber-physical systems.

05/2019 – 12/2019	**Research Assistant.** Stevens Institute of Technology Advisor: Prof. Min Song

Project: Spectrum (Channel) Utilization Optimization
– Designed and implemented K-RCH, a group-based random channel hopping protocol for rendezvous in Cognitive Radio Networks.
– Improved spectral efficiency, reduced time-to-rendezvous (TTR), and enhanced throughput in dynamic spectrum environments.

06/2018 – 08/2018	**Visiting Researcher.** Nanjing University of Posts and Telecommunications Advisor: Prof. Yulong Zou

Project: Secrecy Performance of Hybrid Satellite-Terrestrial Relay Systems
– Analyzed secrecy outage probability under hardware impairments (HIs) in hybrid satellite-terrestrial relay systems.
– Derived closed-form results and investigated impacts of relay location, eavesdropper position, and transceiver impairments on secure communication performance.

Professional Service

2025	**TPC Member, IEEE INFOCOM 2026 (ISAC Track)** Technical program committee member for the ISAC track.
2024 – Present	**Reviewer** – Reviewer for **IEEE INFOCOM 2025–2026** – Reviewer for **IEEE Transactions on Vehicular Technology (TVT)** – Reviewer for **AJECE**

Mentorship Experience

Graduate Mentor. Department of Electrical and Computer Engineering, Stevens Institute of Technology

Supervised and mentored M.S. students in Professor Shucheng Yu's group:

Jiapeng Xiao (Spring 2021): Guided a one-semester master research scholarship; designed projects and trained him in USRP SDR operation for hardware-software integration.

Zhifan Jiang (2022 – 2023): Designed a one-year project on LabVIEW and TMYTEK mmWave antennas; advised research idea development and report writing. Recipient of the *Excellent Research Award*.

Beula Jose (2023): Directed an ongoing one-semester project on adversary experiments using USRP SDR; enhanced her research skills and project performance.

Ruoxi Li (2024 – 2025): Introduced her to communication systems research with TMYTEK mmWave antennas and OFDM transmission in LabVIEW; advised on CSI-based breathing signal collection and professional data analysis. Secured a Ph.D. offer.

Saurabh Raman Parkar (2024 – 2025): Supervised multiple projects on O-RAN with POWDER and srsRAN using USRP SDR; trained for oral presentation and reporting. Recipient of the *1st-rank Department Scholarship*. Co-developed projects on mmWave FMCW sensing and 5G NR OFDM for breathing detection, forming the basis of his master dissertation. Will join UHM as a Ph.D. student in 2026 Spring.

Team Mentor 1. AFRL Software Defined Radio (SDR) Challenge (2024 – 2025)

Mentored a team of undergraduate and high school students to develop wireless projects with USRP SDR. Trained students on implementing MIMO systems with USRP in MATLAB.

Team Mentor 2. AFRL Software Defined Radio (SDR) Challenge (2025 – 2026)

The cooperation with Stevens Institute of Technology and Yeshiva University. My student Saurabh Raman Parkar leads a team of graduate, undergraduate, and high school students to develop RIS based drone detection project.

Collaborators

Dr. Shucheng Yu, Yeshiva University, USA

Dr. Min Song, Stevens Institute of Technology, USA

Dr. Laxima Niure Kandel, Embry-Riddle Aeronautical University, USA

Dr. Chunsheng Xin, Old Dominion University, USA

Dr. Yao Zheng, University of Hawai'i at Mānoa, USA

Dr. Hanqing Guo, University of Hawai'i at Mānoa, USA

Dr. Shuang Li, University of Victoria, Canada

Dr. Changzhi Li, Texas Tech University, USA

Dr. Yulong Zou, Nanjing University of Posts and Telecommunications, China

Skills

Languages	🔖	Strong reading, writing and speaking competencies for English, Mandarin Chinese.
Coding	🔖	MATLAB, Python, LabVIEW, GNU Radio, Visual Studio, C/C++, Java, R
Web Dev	🔖	Html, css, JavaScript.
Platform	🔖	POWDER, COSMOS, open-source srsRAN
Hardware	🔖	Software-Defined Radios (SDRs): USRP B/N series, NI USRP 2974 Antennas: mmWave (beamforming), low-frequency (directional, omni-directional) Measurement equipment: Keysight, Rohde & Schwarz

Skills (continued)

Others   ▉   Unity, Final Cut Pro, Studio One, OBS

Relevant Coursework

Wireless & Security   ▉   Wireless Communications; Communication Theory; Information Systems Security; Computer Network; Information & Coding Theory.

Machine Learning
& Computing   ▉   Applied Machine Learning; Algorithms & Data Structures; Computing Principles for Embedded Systems; Computing Principles for Mobile and Embedded Systems; Computer Architecture; Python; C++.

Mathematics
& Theory   ▉   Advanced Mathematics; Probability Theory & Statistics; Complex Analysis & Integral Transformation; Analytical Methods in Electrical Engineering; Random Signal Analysis.

Circuits
& Signal Processing   ▉   Digital Signal Processing; Signals & Systems; Data Acquisition; Digital Circuit & Logic Design; Analog Electronic Circuits; High-Speed Circuit Signal Integrity Analysis & Design.

Control   ▉   Introduction to Control Theory.