

Xiaochan Xue, Ph.D.

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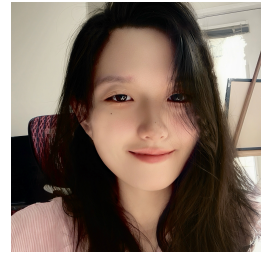
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Summary

I am an **Assistant Professor** of Electrical and Computer Engineering at the University of Hawai'i 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. R. Parkar, S. Yu, and Y. Zheng, "Ai-assisted composite isac for mmwave respiration pattern recognition," Manuscript submitted for publication, 2025.
- 2 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.
- 3 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.
- 4 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.
- 5 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 Cyber-security, Stevens Institute of Technology, NJ, USA. (Poster presentation)
- 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)

Presentations and Seminars (continued)

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

- 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.

Research Experience (continued)

- 05/2019 – 12/2019
- **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.
 - **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.

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. One paper submitted.

Mentor. 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.

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. 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
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.