Saurabh Parkar

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Summary

I am a Ph.D student at University of Hawai'i at Mānoa. My research focuses on advancing next-generation wireless networks, with primary focus on O-RAN architecture, integrated sensing and communication (ISAC), and network security. Looking ahead, I aim to advance intelligent, secure, and adaptable 6G/Next-G systems to enable applications in localization and spatial sensing, autonomous networking, IoT connectivity, and resilient cyber-physical infrastructures. I was awarded *1st Place at the ECE Research Scholarship Expo – Spring 2024* for my work on federated RF fingerprinting in O-RAN architectures. I completed my graduate studies in *M.S. Applied Artificial Intelligence* from *Stevens Institute of Technology*, and undergraduate studies in *Computer Engineering* at *Rajiv Gandhi Institute of Technology (Mumbai University)*.

Education

University of Hawaii at Mānoa **Jan 2026**
Ph.D. in Electrical and Computer Engineering *Honolulu, HI*

Stevens Institute of Technology **Sept 2023 – May 2025**
Master of Science in Applied Artificial Intelligence : GPA - 3.96/4.0 *Hoboken, NJ*

Mumbai University **Aug 2019 – May 2023**
Bachelor of Engineering in Computer Engineering : GPA - 8.81/10 *Mumbai, MH*

Research Experience

Stevens Institute of Technology **Sept 2024 – Dec 2025**
Graduate Research Assistant *Hoboken, NJ*
Advisor: Prof. Shucheng Yu

Thesis: Contactless Respiratory Sensing using mmWave 5GNR and FMCW Radar *Sept 2024 - Jun 2025*

- Developed a dual-modality contactless respiration monitoring system using 28 GHz 5G NR and 2 MHz FMCW radar within an ISAC framework, leveraging USRP-2974 SDRs and phased array antennas.
- Built real-time signal acquisition and preprocessing pipelines; extracted respiration features from CSI and radar returns under indoor LoS conditions.
- Boosted model robustness through synthetic augmentation and achieved 98% accuracy across four breathing patterns using a 1D CNN trained on multi-modal features.

Project 1: Federated Learning for RF Fingerprinting for Device Authentication *Jan 2024 - Jun 2024*

- Implemented federated learning for RF device fingerprinting on the Open RAN (O-RAN) architecture; deployed a custom xApp on the Near-RT RIC for privacy-preserving, distributed training across base stations.
- Simulated and validated performance on the POWDER testbed using X310/B210 USRPs, achieving 99.75% classification accuracy in real-time 5G O-RAN conditions.
- Awarded 1st Prize at ECE Research Expo Spring 2024 for innovation in secure and scalable wireless edge intelligence.

Project 2: Deep Learning-Based Network Slicing for V2X Communication *June 2024 - Aug 2024*

- Developed a deep learning-based network slicing predictor xApp to classify V2X sessions into Low Latency, High Bandwidth, and General slices for dynamic QoS management.
- Trained on Berlin V2X dataset with engineered thresholds, achieving 92% prediction accuracy and enabling adaptive resource allocation via Near-RT RIC.
- Validated performance on an O-RAN testbed with simulated RSUs and UEs, replicating real-world mobility and traffic scenarios.

Professional Experience

Stevens Institute of Technology **Jan 2025 – May 2025**
Graduate Student Grader – Course: AAI-551 *Hoboken, NJ*

- Evaluated weekly programming labs, homework, and exams, applying a detailed rubric covering Python syntax, OOP, and data structure fundamentals.
- Held office hours to debug code, clarify lecture material, and guide best practices, resolving student questions.

- Assisted the instructor to refine grading rubrics, develop sample solutions, and maintain grade records in the Canvas LMS for transparent, consistent assessment.

Line Leverage **May 2024 – Dec 2024**

Machine Learning Intern *Staten Island, NY*

- Sourced and curated statistical data on NBA teams and players.
- Analyzed statistical factors to identify key features influencing team performance.
- Developed and implemented machine learning models to predict match outcomes based on historical performance, enhancing risk management and optimizing betting strategies.

Honors/ Awards

1^{st} Place – ECE Research Scholarship Spring'24 **June 2024**

Provost Masters Fellowship **Sept 2023**

Publications

P.1 X. Xue, **S. Parkar**, S. Yu and Y. Zheng, *"AI-Assisted Composite ISAC for mmWave Respiration Pattern Recognition"*, IEEE AIoT 2025 - IEEE Annual Congress on Artificial Intelligence of Things, Osaka, Japan

P.2 X. Xue, S. Yu, **S. Parkar** and Y. Zheng, *"ROISD: RIS and O-RAN Assisted Intelligent Sensing for UAV Detection"*, IEEE AIoT 2025 - IEEE Annual Congress on Artificial Intelligence of Things, Osaka, Japan.

Presentations/ Workshops

Presentations:

P.1 S. Parkar, X. Xue, S. Yu, "Federated Learning for RF Device Fingerprinting Over Open Radio Access Networks", 1^{st} Symposium on Emerging Topics in Networks, Systems, and Cybersecurity, Stevens Institute of Technology, NJ, USA, August 2024. *(Poster Presentation)*

Workshops:

W.1 NSF CyberTraining: O-RAN-Based Cyberinfrastructure for Future-Generation Wireless Communication and Sensing, Stevens Institute of Technology, NJ, USA, June 2025. *(Conducted hands-on SDR training sessions and experimental demonstrations for students.)*

Technical Skills

Programming Languages: Python, C, C++, MATLAB
Operating Systems: Windows, Linux, Unix
Technologies/Frameworks: TensorFlow, NumPy, pandas, scikit-learn, Matplotlib, Docker, Kubernetes, GNU-Radio, srsRAN.
Algorithms: Machine Learning, Deep Learning, Natural Language Processing (NLP), Data Engineering, Machine Vision, Convolutional Neural Networks (CNN), Recurrent Neural Networks (RNN).

Relevant Coursework

Data Acquisition/Modeling/Analysis, Applied Machine Learning, Probability & Stochastic Processes, Engineering Programming: Python, Data Acquisition: Deep Learning, Pattern Recognition & Classification, Practicum in Applied Artificial Intelligence, Applied Data Structures & Algorithms, Engineering Programming: C++, Engineering Mathematics I–IV, Engineering Mechanics, Basic Electrical Engineering, Engineering Graphics, C Programming, Discrete Structures and Graph Theory, Data Structure, Digital Logic and Computer Architecture, Computer Graphics, Analysis of Algorithm, Database Management System, Operating System, Microprocessor, Theoretical Computer Science, Software Engineering, Computer Network, Data Warehousing and Mining, System Programming and Compiler Construction, Cryptography and System Security, Mobile Computing, Artificial Intelligence, Internet of Things, Machine Learning, Big Data Analytics, Machine Vision, Blockchain, Distributed Computing, Applied Data Science