

# Blessing Andrew Okoro

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## RESEARCH STATEMENT

A wireless AI researcher developing machine learning frameworks for automated spectrum monitoring and interference detection. My PhD research addresses critical challenges in spectrum management by creating unsupervised methods that detect multiple overlapping transmitters, characterize harmonic interference, and enable joint detection and localization. My work has produced 5 peer-reviewed publications at top-tier venues, and contributed to federal spectrum research infrastructure through NSF SpectrumX.

## EDUCATION

**University at Albany, State University of New York** Aug. 2021 - 2026  
Ph.D. Candidate, Computer Science (CGPA: 3.96/4.0)  
NSF SpectrumX Graduate Research Fellowship, 2024 - 2025

**University at Albany, State University of New York** Aug. 2021 - May 2024  
Master of Science in Computer Science (CGPA: 3.94/4.0)

**Federal University of Technology, Owerri, Nigeria** 2013 - 2018  
Bachelor of Engineering, Electrical and Electronic Engineering  
CGPA: 4.73/5.0 (First Class Honors)

## EXPERIENCE

**Graduate Research Assistant** – UbiNET Lab, advised by Prof. Mariya Zheleva Aug 2021 – Present  
Project: Multi-Transmitter Detection in Complex Spectrum Environments

- Designed SCAN, an OMP-based sparse coding framework for detecting and separating overlapping transmitters.
- Developed a realistic MATLAB simulation environment emulating real-world transmission scenarios.
- Validated the framework using real-world, over-the-air, and simulated experiments, achieving >95% detection accuracy for up to 10 concurrent transmitters at low SNR; published at IEEE INFOCOM 2025.

Project: Harmonic Interference Detection for Radio Astronomy Protection

- Designed M-SHarc, a multi-spectral framework for detecting harmonic emissions and mapping them to fundamental sources.
- Implemented a diffusion-based generative model for RF signal denoising and improved detection.
- Validated the framework using real-world spectrum data from Green Bank Observatory; currently under review at IEEE DySPAN 2026.

Project: Joint Detection and Localization for Spectrum Enforcement

- Designed MDL, a unified framework for joint transmitter detection and spatial localization using distributed sensors.
- Developed a dictionary-based tensor decomposition method with Graph Fourier Transform, achieving  $2\times-12\times$  lower localization error and 25% higher detection accuracy than power-based baselines; currently under review at IEEE ICC 2026.

Project: Spectrum Data Trustworthiness Assessment

- Contributed to VIA, a framework for assessing spectrum measurement reliability across heterogeneous sensor platforms.
- Designed and conducted multi-SDR noise profiling experiments using USRP and RTL radios, enabling platform-agnostic reliability prediction with a mean squared error of 0.0013; published at INFOCOM 2024.

**Teaching Facilitator, NSF SpectrumX Summer School** Summer 2023, 2024, 2025

- Facilitated wireless communications training for undergraduate students from underserved institutions across three summers.
- Developed Python-based instructional materials for RF data collection, spectrum analysis, and SDR testbed deployment.
- Led hands-on labs and hackathon competitions covering WiFi protocols, spectrum sensing, and signal characterization.

**Software Application Specialist, ISN Nigeria Ltd** March 2019 – May 2021

- Designed and maintained backend services and internal APIs supporting large-scale service operations, improving system reliability and reducing customer downtime by approximately 80%.
- Developed data-driven scheduling and automation tools to manage service workflows, reducing Mean Time To Repair (MTTR) and improving operational efficiency.

## PUBLICATIONS

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**Okoro**, McNeil, Meka, Doke, Bogdanov and Zheleva. SCAN: Sparse reCOvery trAnsmmitter detectioN. In Proceedings of the IEEE International Conference on Computer Communications, pp. 1-10. PDF: <https://okoroandrew.github.io/files/SCAN.pdf> (INFOCOM'25).

**Okoro**, Taneja, Mattoon, Li and Zheleva. M-SHarC: Multi-Spectral Harmonic Characterization. Submitted to the IEEE International Symposium on Dynamic Spectrum Access Networks. Preprint: <https://okoroandrew.github.io/files/M-SHarC.pdf> (DySPAN'26).

**Okoro**, Bogdanov and Zheleva. MDL: Joint Time-Frequency-Space Transmitter Analytics via Dictionary-Based Tensor Factorization. Submitted to the IEEE International Conference on Communications. Preprint: <https://okoroandrew.github.io/files/MDL.pdf> (ICC'26).

Doke, **Okoro**, Zare and Zheleva. VIA: Establishing the Link Between Spectrum Sensor Capabilities and Data Analytics Performance. In Proceedings of the IEEE International Conference on Computer Communications, pp. 2229-2238. Paper: <https://okoroandrew.github.io/files/VIA.pdf> (INFOCOM'24).

Doke, Sarkar, **Okoro**, Cabric and Zheleva. RadVIEW: Robust Radar Detection and Characterization in High-Noise Regimes. In Proceedings of the IEEE International Symposium on Dynamic Spectrum Access Networks, pp. 1-8. PDF: <https://okoroandrew.github.io/files/RadVIEW.pdf> (DySPAN'24).

## PROJECTS

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**Spectrum Data Annotation and Student Competition Support:** Led large-scale annotation of real-world spectrum data via the NSF [SpectrumX](#) initiative, enabling dataset release and the student data and algorithm competition.

**Wireless Network Measurement and Congestion Analysis:** Conducted experimental studies of IEEE 802.11 WiFi congestion using Wireshark and iperf, analyzing throughput, channel utilization, and RTS/CTS behavior; developed an Android application to measure WiFi and cellular network performance in managed and unmanaged environments.

**Networked Systems and Reliable Data Transfer:** Implemented reliable client-server communication using TCP sockets and designed UDP-based stop-and-wait protocols to ensure data reliability.

**Real-Time Drowsiness Detection System:** Built a non-intrusive, CNN-based real-time drowsiness detection system achieving over 98% accuracy.

## SKILLS

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<b>Programming Languages:</b>	Python, Matlab, C, Java, Bash
<b>Machine Learning &amp; Data:</b>	TensorFlow, PyTorch, Scikit-learn, NumPy, Pandas, Matplotlib
<b>Networking &amp; RF Tools:</b>	POWDER, iPerf, Wireshark, TShark, GNU Radio, USRP, RTL-SDR
<b>Signal Processing &amp; Analysis:</b>	FFT, Spectral Analysis, Sparse Coding, OMP, Graph Signal Processing

## AWARDS

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CyberPowder Fellowship	2025
NSF SpectrumX GRS Fellowship	2024
Research Project Assistant, RFSUNY	2021
Federal Government Scholarship Award	2017
MTN Foundation Science and Technology Scholarship Award	2015
Agbami Medical and Engineering Professionals Scholarship Award	2015

## PROFESSIONAL ACTIVITIES

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SpectrumX Center Meetings — Poster presentations (Fall 2025: UW-Madison; Spring 2025: Virtual; Spring 2024: Washington, DC; Fall 2023: Northwestern University)

MEP Hardware Assembly Workshop, MIT Haystack Observatory, Westford, MA	Nov 2024
MEP Software Testing Workshop, MIT Haystack Observatory, Westford, MA	Jun 2025
NSBE Annual Convention, Atlanta, GA	Mar 2024
New England Workshop on Software-Defined Radio, Worcester, MA	Jun 2023
HotMobile Workshop, Orange County, CA	Feb 2023
Young Gladiators Colosseum Master Class, Northeastern University, Boston, MA	Nov 2021