Michelle Pirrone

PhD Student
Expected Graduation: Spring 2025

Contact Details

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https://mpirrone1.github.io

Core Skills

EMC/EMI testing
Communication systems
Test design and automation
Circuit design
RF testing and methods
Software Defined Radios
Data analysis

Software Skills

Coding: Python, Matlab, C, Linux, SCPY
AWR Microsoft Office
Keysight ADS
Ansys HFSS
LTSpice
GNU Companion
Solidworks

Other

Grant and proposal writing
Proficiency: English, Spanish
Project Planning

Executive Summary

PhD student at the University of Colorado Boulder performing research with the National Institute of Standards and Technology (NIST). Highly motivated engineer with a diverse background in communication systems, RF design, and machine learning. Seeking a challenging, collaborative environment to work on new research or improve current technologies.

Work Experience

NIST (CU Boulder)
PhD Student
1/2023 - Present

- Investigate proxy interference signals for EMC/EMI testing and compare to current standards and practices.
- Develop automated, general-purpose testbeds with COTS victim systems, SDRs for interference generation, and Python data analysis scripts.
- Explore communication signal composition in the time and frequency domain to broadly classify interference signal impacts.

University of Colorado Boulder
PhD Student
7/2020 - 1/2023

- Integrated RF hardware with optimization/machine learning algorithms developed in Matlab, Python, and Linux for real-time, adaptive systems.
- Researched optimized self-interference cancellation with SDR in simultaneous transmit and receive (STAR) balanced amplifier architecture.
- Investigated and produced load modulated balanced amplifier (LMBA) architecture in AWR with WIN GaN process for X-band.

SUNY New Paltz
Undergraduate Researcher
8/2016 - 5/2020

- Designed in HFSS 3-D printed, dielectrically loaded S-band patch antennas.
- Characterized patch antenna performance with test equipment.
- Co-designed in ADS and HFSS dielectric resonator antenna with packaged electronics and analyzed different EMI coating methods for Sono-Tek Corp.
- Capstone project developed wearable VR controller with packaged electronics, motion tracking in TensorFlow, and virtual demo in Unity.

Fair-Rite Corp.
Research Intern
Summer 2019

- Investigated ferrite behaviors for different compositions and structures.
- Performed high power, temperature, and frequency testing to examine distortions and breakdown behaviors.
- Contributed to internal production standards.

Education

University of Colorado Boulder   **July 2020 - May 2025**
PhD (in progress) | Electrical Engineering | GPA: 3.86
M.S. | Electrical Engineering | May 2023

State University of New York at New Paltz   **August 2016 - May 2020**
B.S. | Major: Electrical Engineering | Minor: Biology | GPA: 3.92
Outstanding Graduate Award, Summa Cum Laude

Distinctions

- Best Student Paper Award (*EMC+SIPI 2024*)
- DoD NDSEG Fellowship (*DoD 2022*)
- Dean's Excellence Scholarship (*CU Boulder 2020*)
- Outstanding Graduate Award (*SUNY New Paltz 2020*)

- AYURE/SURE Research Grants (SUNY New Paltz 2018)
- Honor's Program (SUNY New Paltz 2016-2020)
- Presidential Scholarship (SUNY New Paltz 2016-2020)
- Regents Scholarship (New York State 2016-2020)

Select Publications

- **M. Pirrone**, J. Bernhardt, A. Wunderlich, "Assessing Directional Time-Dependent Interference Vulnerabilities in Closed-Box Wireless Systems," *IEEE Transactions on Electromagnetic Compatibility, 2024*, accepted.

- **M. Pirrone**, E. Dall'Anese, T. Barton, "Data-Driven Optimization Strategies for Tunable RF Systems," *IEEE Transactions on Microwave Theory and Techniques*, 2024.

- **M. Pirrone**, G. Giesbrecht, E. Dall'Anese, T. Barton, "Zeroth-Order Optimization for Self-Interference Cancellation in STAR Front-End," *2024 IEEE Wireless and Microwave Technology Conference (WAMICON)*, 2024.

- **M. Pirrone**, *et al.*, "ATIC: Automated Testbed for Interference Testing in Communication Systems," *IEEE Military Communication Conference (Milcom)*, 2023.

- W. Sear, D.T. Donahue, **M. Pirrone**, T. Barton, "Bias and Bias Line Effects on Wideband RF Power Amplifier Performance," *2022 IEEE Wireless and Microwave Technology Conference (WAMICON)*, 2022.

- R. Dahle, I. Nesheiwat, R. Murillo, **M. Pirrone**, "EMI Shielding Effectiveness Study of a 3D Printed Antenna in Package (AiP)," 2022. *Industry white paper for Sono-Tek*.