Michelle Pirrone

Email: michelle.pirrone@colorado.edu | **Phone**: 845-863-9434
LinkedIn: www.linkedin.com/in/michelle-pirrone

Research Interests

Transceiver design, optimization techniques, machine learning, intelligent RF control systems.

Education

University of Colorado Boulder   **June 2020 – May 2025**

Ph.D. in Electrical Engineering | GPA: 3.857
Funding: DoD NDSEG Fellowship
Advisors: Taylor Barton and Emiliano Dall'Anese

State University of New York at New Paltz   **Aug. 2016 – May 2020**

B.S. in Electrical Engineering, Minor in Biology | GPA: 3.92
Funding: Presidential Scholarship, NY Regents Scholarship
Outstanding Graduate Award, Summa Cum Laude

Research Experience

Graduate Research Assistant (CU Boulder)   **July 2020 – Present**
RF Power and Analog Lab | Dall'Anese Group

Integrate RF circuits and systems in real-time feedback loops with optimization and machine learning techniques to compensate for varying conditions and behaviors. Explore new amplifier and transceiver architectures such as load modulated balanced amplifiers (LMBAs) and quadrature balanced power amplifiers (QBPAs). Research new methods of optimization and develop hardware systems with MATLAB and Python control algorithms.

Undergraduate Research Assistant (SUNY New Paltz)   **Jan. 2018 – May 2020**
Dahle Research Lab | Mass Biology Lab

Develop methods for characterizing 3-D printing parameters on RF devices, specifically patch antennas. Combine 3-D printing with dielectric loading in antennas to simulate and measure RF performance. Further investigate dielectric resonator antennas with antenna in package designs; integrating electronics into the antenna and examining EMI solutions. Additional research performed in the biology department characterizing locomotion in mutated amphibians to understand developmental differences.

Senior Design Capstone Project (SUNY New Paltz)   **Aug. 2019 – May 2020**

Team leader for a 1-year capstone project to investigate new techniques for integrating electronics and software into a wearable virtual reality controller. Examined haptic feedback, force sensing measurements in the forearm, motion tracking in TensorFlow, and virtual demonstrations in Unity. Additionally considered mechanical robustness and microprocessor integration.

Publications

C1. **M. Pirrone**, E. Dall'Anese and T. Barton, "Zeroth-Order Optimization for Varactor-Tuned Matching Network," *2022 IEEE/MTT-S International Microwave Symposium - IMS 2022*, 2022.

C2. W. Sear, D. T. Donahue, **M. Pirrone** and T. W. Barton, "Bias and Bias Line Effects on Wideband RF Power Amplifier Performance," *2022 IEEE 22nd Annual Wireless and Microwave Technology Conference (WAMICON)*, 2022, pp. 1-4.

I1. R. Dahle, I. Nesheiwat, R. Murillo, and **M. Pirrone**, "EMI Shielding Effectiveness Study of a 3D Printed Antenna in Package (AiP)". 2022. *Industry white paper publication for Sono-Tek.*

P1. **M. Pirrone**, V. Narici, D. Barnhart, S. Mass, "Comparing the Kinematics of Metamorphosed Axolotls and Tiger Salamanders," *2019 Society for Integrative and Comparative Biology,* P2-253.

P2. V. Narici, **M. Pirrone**, D. Barnhart, S. Mass, "Using Force to Characterize the Efficiency of Ambystomoid Locomotion," *2019 Society for Integrative and Comparative Biology,* P2-254.

Distinctions

DoD NDSEG Fellowship (CU Boulder / DoD)	**Sept. 2022 – Sept. 2025**
Engineering Graduate Fellowship (CU Boulder)	**July 2020 – Dec. 2020**
Dean's Excellence Scholarship (CU Boulder)	**Aug. 2020**
IMS Project Connect Recipient (CU Boulder / IMS)	**July 2020**
Outstanding Graduate Award (SUNY New Paltz)	**May 2020**
AYURE/SURE Research Grants (SUNY New Paltz)	**Jan. 2018 – Aug. 2018**
Honor's Program (SUNY New Paltz)	**Aug. 2016 – May 2020**
Dean's List (SUNY New Paltz)	**Aug. 2016 – May 2020**
Presidential Scholarship (SUNY New Paltz)	**Aug. 2016 – May 2020**
New York State Regents Scholarship (SUNY New Paltz / NYS)	**Aug. 2016 – May 2020**

Skills

- Simulation: *AWR, ADS, HFSS, SPICE*
- Coding: *MATLAB, Python, C, Linux*
- 3D Modeling: *Solidworks*
- Electrical Design: *PCB, MMIC, RF*
- Automation: *SCPY, GNU Companion*
- Test Equipment: *VNA, SA, SDRs, radiation measurements*
- Technical and Proposal Writing

Teaching Experience

Teaching Assistant, Department of Electrical Engineering (CU Boulder)
ECEN 3300: Linear Systems   **Spring 2022**

Topics include the use of differential equations and Fourier and Laplace transforms applied to continuous time systems and the application of these systems in communications and control systems. Responsible for holding recitation sessions with practice problems and grading of homework and exams.

Teaching Assistant, Department of Electrical Engineering (CU Boulder)

ECEN 5634: Microwave and RF Lab **Spring 2021**

Topics include S-parameters, power measurements, antenna characterization, RADAR, and transmitter operation. Hands-on experience with VNAs, SAs, and antenna measurements. Responsible for organizing the experimental setup, providing and grading pre-labs, and grading lab reports.

Teaching Assistant, Department of Electrical Engineering (SUNY New Paltz)

EGE 201: Circuits Lab **Aug. 2019 – May 2020**

Topics include nodal and mesh approaches, maximum power transfer, Thevenin theorem, and first and second order circuits. Both theory and hands-on experiments were performed. Responsibilities included lecturing, experimental troubleshooting, grading, and office hours.

Work Experience

IT Technician (SUNY New Paltz) **Aug. 2019 – May 2020**

Perform diagnostics and repairs on devices including classroom technology, laptops, cell phones, and tablets. Assist both in software and hardware restoration and provide recommendations for external support. Additionally provide over the phone support for software and write service tickets for upper-level IT installation and repair.

Research and Development Intern (Fair-Rite Corp.) **May 2019 – Aug. 2019**

Wallkill, New York

Lead researcher in supporting new internal research on ferrite material characterization and breakdown behavior. Investigate different ferrite compositions, shapes, and configurations for behavioral responses along with examine distortion at high frequencies and breakdown behavior at high power. Contribute to internal production standards.

Organizations

Women in Microwaves (WiM)	**Oct. 2021 – Present**
Order of the Engineer	**May 2020 – Present**
IEEE Eta Kappa Nu (HKN)	**March 2019 – Present**
McNair Scholar's Program – Mentor	**Sept. 2020 – May 2022**
Graduate Mentor Program – Mentor	**Sept. 2021 – May 2022**

Select Classes

- ECEN 5024 – RF Power Amplifiers
- ECEN 5014 – Special Topics: Active Microwave Circuits
- ECEN 5797 – Intro to Power Electronics
- ECEN 5014 – Special Topics: MMIC Design
- ECEN 5407 – Renewable Energy and the Power Grid
- EGE 593 – Microelectronic Reliability