Michelle Pirrone

michelle.pirrone@colorado.edu | 845-863-9434 | www.linkedin.com/in/michelle-pirrone

Ph.D. - Electrical Engineering (in progress)

University of Colorado Boulder | DoD NDSEG Fellowship   June 2020 – May 2025
Advisors: Taylor Barton and Emiliano Dall'Anese

Projects

Optimized Simultaneous Transmit and Receive (STAR) Network   Jan. 2022 – Present

- Design of autonomously adaptive STAR front-end to minimize self-interference (SI).
- Test setup includes use of NI USRP-N200 and Wolfspeed CG2H40025F evaluation boards.
- Implementation of gradient descent optimization to minimize SI in varying operating conditions.
- Control system and signal generation coded in Python using Linux operating system.

Machine Learning Techniques for Tunable Matching Network   July 2021 – Sept. 2022

- Demonstration of machine learning techniques in varactor-tuned matching network.
- Exploration of gradient descent, neural network, and combined hybrid techniques.
- Testing performed for dynamic loading conditions at 850 MHz using Rohde & Schwarz ZNA67.

Load Modulated Balanced Amplifier (LMBA) Design   July 2021 – Dec. 2021

- Design of an LMBA MMIC in WIN Semiconductors .15μm GaN HEMT process at 6-12 GHz.
- Emphasis on high efficiency performance and active load modulation behavior.

Doherty Amplifier Design   Jan. 2021 – May 2021

- Design of Doherty amplifier at 3.5 GHz using Wolfspeed CG2H40010 with emphasis of backoff performance for ECEN 5024 – RF Power Amplifiers.

MTT-IMS High Efficiency Power Amplifier   June 2020 – Oct. 2020

- Design of high efficiency, high linearity PA at S-band - awarded 2nd place at IEEE competition.

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
- Public Speaking: *Conference presentations, teaching assistantships*

Publications

- **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.
- 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.*
- 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.

Selected Classes

- ECEN 5024 - RF Power Amplifiers
- ECEN 5014 - Active Microwave Circuits
- ECEN 5797 - Intro to Power Electronics
- ECEN 5407 - Renewable Energy and Power Grid
- ECEN 5014 - MMIC Design

B.S. - Electrical Engineering, Minor – Biology

State University of NY at New Paltz | GPA – 3.92 *Summa Cum Laude*   **May 2020**

Selected Projects

EMI Shielding of Antenna in Package (AiP) With 3-D Printing   **Jan. 2020 – Dec. 2021**

- Design of dielectric resonator antenna with custom amplifier layout inside of antenna.
- Co-simulation of antenna and amplifier in HFSS and ADS.
- Device manufactured with 3-D printing and comparison made of performance with different conductive shielding for Sono-Tek.

Microstrip Antenna Design With 3-D Printing   **Jan. 2019 – Jan. 2021**

- Design of dielectrically – loaded microstrip antennas using ANSYS HFSS.
- Antenna designs 3-D printed and substrate characterization was performed.
- Analysis was performed for different 3-D printing variables and dielectric loading conditions.

Wearable Virtual Reality Controller   **Aug. 2019 – May 2020**

- Team leader for capstone project that developed a wearable, virtual reality glove with haptic feedback and motion tracking software.
- Software development in Unity (demonstration software) and TensorFlow (motion tracking).

Kinematic Study of Locomotion in Mutated Axolotl Salamanders   **Jan. 2018 – Jan. 2019**

- Mechanical and developmental analysis of movement in mutated Axolotls.
- Received two internal grants (AYURE and SURE) and presented findings at two conferences (Society of Developmental Biology and Society of Integrative and Comparative Biology).

Selected Classes

- EGE 493 - Intro to Microwave Engineering
- EGE 593 - Microelectronic Reliability
- EGE 416 - Control Systems
- EGE 412 - Communication System Theory

Experience

Teaching Assistant | CU Boulder and SUNY New Paltz   **Aug. 2019 – May 2022**

- Provided office hours, instruction, and grading for the following classes: Circuits Lab, Microwaves Lab, Linear Systems

Research and Development Intern | Fair-Rite | Wallkill, NY   **May 2019 – Aug. 2019**

- Characterized and tested ferrite materials including distortion at high frequencies.
- Established standards for size and orientation of material behavior in company publications.

Distinctions

- DoD NDSEG Fellowship
- Engineering Graduate Fellowship
- Dean's Excellence Scholarship
- IMS Project Connect Recipient
- Outstanding Graduate Award
- Presidential Scholarship
- New York State Regents Scholarship
- AYURE/ SURE Grant
- SUNY New Paltz Honor's Program