Emma Blancett

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EDUCATION

North Carolina State University | Raleigh, NC **May 2027**

Bachelor of Science in Electrical Engineering GPA: 3.83/4.0

RESEARCH EXPERIENCE

The Antenna and Electromagnetic Lab | Undergraduate Researcher **April 2025 – Current**

- Expanded a VNA-to-computer interface to support accurate S-parameter calibration, gain and return loss measurements, and streamlined measurement data storage through an enhanced GUI
- Developed post-processing capabilities to expand plot types, introduce interactive plotting, and enable live S21 measurement plotting
- Built and measured patch, horn, and dielectric resonator antennas made from an Anten'it Antenna Research Kit to compare the accuracy of the chamber to their data sheet specifications

Farfurnik Spin-Photon Lab | Undergraduate Researcher **August 2024 – January 2025**

- Developed machine learning models using Roboflow to automate nanocavity image capture, quality assessment, and motorized stage control on an optical table to enhancing spin-photon interface characterization
- Operated optical set ups to acquire nanocavity image datasets under visible and UV light

Active Robotics Sensing Lab | Undergraduate Researcher **January 2024 – July 2025**

- Developed Python scripts to enable motor control and image capture for a Raspberry Pi-based plant imaging system, becoming proficient with terminal-based environments
- Created 3D reconstructions of various plant types to train machine learning models by integrating 3D point clouds generated from 2D images with optical laser data and then applying Gaussian splatting techniques
- Constructed camera calibration filters in OpenCV using the checkerboard calibration method to remove intrinsic and external distortions of the plant images

PERSONAL PROJECTS

Beam Forming Patch Antenna Array Simulation in CST **May 2025 -Current**

- Simulated a beamforming array of 2.4 GHz microstrip patch antennas with beam steering capabilities in CST
- Optimized a single patch antenna in CST for 50 Ohms impedance and achieving S11= -43 dB and 7.11 dBi gain with a custom dielectric material

Electromagnetic Levitation With Coil Set Up **January 2025- June 2025**

- Built a levitation system for a small magnet from scratch using an electromagnetic coil, Hall sensor, a MOSFET, and a diode to achieve controlled
- Implemented both analog and Arduino-based microcontroller stabilization techniques to ensure stable magnet levitation and improve system stability

TEAM EXPERIENCE

Pack Bionics | Electrical Team Member **August 2023 - May 2024**

- Designed circuits and developed code for power distribution, sensor integration, gyroscope feedback, and motor control on prosthetic leg
- Optimized CAD models in SolidWorks for mechanical tolerances and integrating electronic components

FIRST Robotics 5607 | Build Captain **August 2019 - May 2023**

- Led the Build sub team to design and built a robot within a 6 week frame for a competitive sports-like game
- Effectively assigned and supervised multiple tasks, ensuring safe and efficient environment while team worked to assemble the metal frame for robot as well as build a wooden replica of the arena

TECHNICAL SKILLS

Hardware: Vector Network Analyzer, Spectrum Analyzer, Oscilloscope, RF Test Equipment, Soldering
Languages: Python, C Programming
Design: AutoCAD Certified, SolidWorks