

Electrical/Computer Engineer with interests in control systems and signal processing. Currently working on my master's thesis in an accelerated program at Virginia Tech.

## Education

### Master of Science in Computer Engineering

Virginia Tech – Focused on Control Theory – GPA: 3.7/4.0

*Advisers: Dr.Thinh Doan (UT Austin) and Dr.Michael Hsiao (Virginia Tech)*

May 2025

Blacksburg, Virginia

### Bachelor of Science in Electrical & Computer Engineering (double major)

Virginia Tech – Control Systems and Machine Learning – GPA: 3.7/4.0

May 2024

Blacksburg, Virginia

## Technical Experience

### Control Theory (Reinforcement Learning) Research | M.S. Thesis

*Virginia Tech · Graduate Researcher*

Aug 2023 – Present

Blacksburg, Virginia

- Undergraduate and graduate research developing neuro-symbolic algorithms with The C.O.O.L. Autonomy Lab at The University of Texas at Austin.
- Developing hardware for a 6-axis robot arm and software for a ROS2 simulation environment used to test custom Reinforcement Learning algorithms.

### Continuous and Discrete Systems · Graduate Teaching Assistant

Aug 2024 – Dec 2024

Blacksburg, Virginia

- Taught fundamental concepts in linear systems theory and digital signal processing, including Laplace Transforms, Z-Transforms, system stability, and FIR & IIR filter design.
- Assisted with hands-on projects to illustrate and integrate analog and digital filter design and application on breadboards and TI MSP432 development boards.

### Thrust Vector Control (TVC) | Mars Ascent Vehicle (MAV)

*Jacobs Space Exploration Group · TVC Intern*

May 2024 – Aug 2024

Huntsville, Alabama

(Merrit Island, Florida)

- Developed thrust vector control testing hardware and software as part of NASA's Active Inertial Load Simulator at the Marshall Space Flight Center.
- Characterized and created a model of an electro-mechanical actuator including internal viscous and (non-linear) coulomb friction components.
- Derived control systems for a load simulating actuator, in Simulink – used to simulate external loads placed on the Mars Ascent Vehicle's thrust vector control actuators during flight.
- Designed and integrated a 3<sup>rd</sup> order IIR filter to remove high frequency noise from a load cell and linear variable differential transformer (LVDT).

### Control Systems Research | Microgrid Inverters

*Grenoble Electrical Engineering Laboratory · Research Intern*

June 2023 – Aug 2023

Grenoble, France

- Researched inverter control systems – designed to be robust to islanding events and avoid future infrastructure problems on the French power grid.
- Simulated neutral point capacitive and balancing control methods using 4-leg inverters in Simulink. Tested PI control, PR control, Clarke and Park Transforms with HIL simulations.

### Naval Concept Design Research | Hospital Sea Trains

*Naval Surface Warfare Center (Carderock Division) · Concept Research Intern*

June 2022 – Aug 2022

West Bethesda, Maryland

- Developed concept hospital sea-train designs at the Center for Innovation in Ship Design and estimated fuel consumption and electrical power loads of concept sea-trains.

## Skills

**Software:** C/C++, Python, MATLAB, GNU/Linux, Simulink, Git, ROS2, Gazebo, Make, CMake, Labview, Qt, PyTorch, OpenCV, LaTeX, Verilog, FreeRTOS, Autodesk Inventor, SolidWorks, Rhino

**Hardware:** PCB Design and Assembly, Breadboarding, Computer Architecture, Oscilloscope, Multimeter, 3D-Printing

## Projects

### FOC Stepper Motor ([github.com/hunterwellis](https://github.com/hunterwellis))

Dec 2023 – Present

- Backdrivable stepper motor driver using FOC and a magnetic encoder for feedback
- 4-layer PCB mounts to the back of the motor with CAN and power connections

### Computer Vision | OCR Capstone Project ([capstone\\_brochure.pdf](#))

Aug 2023 – May 2024

- IOS application capable of detecting coins of interest/value
- Trained OCR and ResNet-50 models on a dataset of real and augmented coin images

### Design Teams | Solar Car & Human Powered Submarine ([solarcaratvt.org](https://solarcaratvt.org))

Oct 2020 – Mar 2023

- Overall E/E architecture of the Solar Car
- Single board computer and LCD to display relevant data to the submarine pilot