Hunter Ellis
Electrical & Computer Engineer

(703) 953-6963
hunterellis@vt.edu
github.com/hunterwellis
ellishw.tech

Engineer with an interest in control theory and embedded systems.
↪ Currently, working on my Master's Thesis in Dr.Thinh Doan's Research Group.

Skills

Languages: C++, Python, MATLAB, Embedded C, LaTeX, Verilog

Tools: Simulink, Soldering, PCB Design and Assembly, GNU/Linux, Git, ROS2, Gazebo, PyTorch, OpenCV, 3D-Printing, SciKit-Learn, Make, CMake, LabView, Qt, KiCAD, FreeRTOS, Autodesk Inventor, SolidWorks, Rhino

Education

Master of Science in Computer Engineering — May 2025
Virginia Tech – Focused on Control Theory — *Blacksburg, Virginia*
Advisers: Dr.Thinh Doan (UT Austin) and Dr.Michael Hsaio (Virginia Tech)

Bachelor of Science in Electrical & Computer Engineering (double major) — May 2024
Virginia Tech – Control Systems and Machine Learning — *Blacksburg, Virginia*

Experience

Robotics & Control Theory Research | M.S. Thesis — Aug 2023 – Present
Virginia Tech · Graduate Researcher — *Blacksburg, Virginia*
- Undergraduate and graduate research developing neuro-symbolic algorithms
- Developing robotic hardware and software tools for testing algorithms
- Working on merging symbolic programming with deep RL for multi-task agents
- Building ROS2 workspaces and packages for training custom RL agents
- Designed and implemented symbolic RL methods to beat Atari games

Graduate Teaching Assistant | Continuous & Discrete Systems — Aug 2024 – Present
Virginia Tech · Teaching Assistant — *Blacksburg, Virginia*
- Assisting Professors in teaching fundamental concepts in linear systems theory and DSP
- Holding office hours and preparing recitation sessions for students

Thrust Vector Control | Mars Ascent Vehicle (MAV) — May 2024 – Aug 2024
Jacobs Space Exploration Group · TVC Intern — *Huntsville, Alabama (Merrit Island, Florida)*
- TVC for Mars Sample Return Mission and EUS at the NASA Marshall Space Flight Center
- Developed software and hardware systems for NASA's Active Inertial Load Simulator
- Characterized dynamic systems for MAV's TVC test stand using Python and MATLAB.
- Derived a non-linear model and control architecture for a load simulating actuator
- Traveled to Kennedy Space Center for the Space Launch System's (Booster) TVC Testing

Control Systems Research | Microgrid Inverters — June 2023 – Aug 2023
Grenoble Electrical Engineering Laboratory · Research Intern — *Grenoble, France*
- Researched "microgrids" – designed to avoid infastructure problems on the French Grid
- Simulated neutral point balancing control methods using 4-leg inverters in Simulink
- Investigated NPC inverters with unbalanced network conditions for islanding events

Naval Concept Design Research | Hospital Sea Trains — June 2022 – Aug 2022
Naval Surface Warfare Center (Carderock Division) · Concept Research Intern — *West Bethesda, Maryland*
- Developed concept hospital sea-train design at the Center for Innovative Ship Design
- Estimated fuel consumption and electrical power loads of concept sea-trains

Projects

FOC Stepper Motor (github.com/hunterwellis) — Dec 2023 – Present
- Widely applicable stepper motor driver using FOC and a magnetic encoder for feedback
- 4-layer PCB mounts to the back of stepper with CAN and power connection

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 dataset of real and augmented coin images

Design Teams | Solar Car & Human Powered Submarine (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