Hunter Ellis
Electrical & Computer Engineer

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github.com/hunterwellis
ellishw.tech

Engineer with an interest in control theory and embedded systems.
↪ Currently working on my thesis in an Accelerated Master's Program at Virginia Tech.

Skills

Software: C/C++, Python, MATLAB, GNU/Linux, Simulink, Git, ROS2, Gazebo, Make, CMake, Labview, Qt, PyTorch, OpenCV, 3D-Printing, LaTeX, Verilog, FreeRTOS, Autodesk Inventor, SolidWorks, Rhino

Hardware: SMD Soldering, PCB Design and Assembly, Oscilloscope, Multimeter, 3D-Printing

Education

Master of Science in Computer Engineering — May 2025
Virginia Tech – Focused on Control Theory – GPA: 3.8 — *Blacksburg, Virginia*
Advisers: Dr.Thinh Doan (UT Austin) and Dr.Michael Hsiao(Virginia Tech)

Bachelor of Science in Electrical & Computer Engineering (double major) — May 2024
Virginia Tech – Control Systems and Machine Learning – GPA: 3.7 — *Blacksburg, Virginia*

Experience

Control Theory (Reinforcement Learning) 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 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
- 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) — 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