Edward Silva

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Experience

Software Engineering Intern, Kratos Defense — June – Aug 2025
C++, MATLAB, Python — Colorado Springs, CO

- Achieved a 1.6x execution speedup on legacy real-time DSP code in C++ with AVX-512 vectorization
- Researched and demonstrated an improved approach to coding a FIR filter, presenting positive findings and performance gains to the team for adoption in future projects
- Built a logging framework with configurable severity levels and error tracking

Projects

Non-Linear State Estimation for the EMBR Damper, MATLAB, Simulink — Spring 2026

- Architected a non-linear state estimation strategy for an active electromagnetic suspension system, modeling the dynamic interactions of a custom magnetorheological (MR) fluid damper, MOSFET power regulation, and a multi-sensor measurement array
- Formulated continuous and discrete-time non-linear state-space models in MATLAB and Simulink, simulating system kinematics to validate damping performance against harmonic, stochastic, and discrete terrain disturbances
- Implemented Extended (EKF) and Unscented (UKF) Kalman Filters for unmeasured state estimation, applying the UKF to eliminate analytical linearization errors and tightly bound state error covariance during highly non-linear fluid yield transitions

Pitch-Tracking Systems in Auto-Tune, MATLAB — Spring 2026

- Managed latency and residual error reporting to verify the performance of real-time Fast Fourier Transform (FFT) and Autocorrelation (ACF) pitch-tracking algorithms in MATLAB
- Designed automated data visualization scripts to quantify computational processing time, demonstrating a 2.68x execution speedup for FFT over ACF
- Validated overall pitch-tracking system effectiveness across an 8000 Hz decimated signal chain utilizing cascaded Butterworth band-pass filtering

Autonomous Maze-Navigating Robot, Python — Fall 2025

- Co-developed an autonomous maze-navigating robot within a 4-person team, integrating computer vision, embedded control, and I2C communication to achieve the second-fastest course completion time in the cohort
- Built the computer vision subsystem using Python and OpenCV with ArUco marker detection to extract real-time distance and angle metrics for navigation
- Designed a multithreaded vision pipeline processing 640x480 video feeds with HSV color masking to identify directional markers for pathfinding logic
- Interfaced the vision subsystem with motor control via I2C bus, transmitting telemetry data to an Arduino while updating a real-time RGB LCD display

Skills

Skills: C++, Python, C, SIMD, MATLAB, Simulink, Git, Arduino, Bash, Linux, RISC-V Assembly, SSH, Verilog

Education

Colorado School of Mines — May 2026
BS Electrical Engineering, Minor in Computer Science
Relevant Coursework: Signals and Systems I/II, Algorithms, Digital Signal Processing, Estimation Theory & Kalman Filtering, Modern Control Design, Embedded Systems, Computer Architecture, Software Engineering