Edward Silva

linkedin.com/in/edwardasilva | edwardasilva.com | eedwardasilva@gmail.com | (702) 720-7735

Research interests: RF engineering, signal processing, and information and learning systems

Education

Colorado School of Mines May 2026

BS Electrical Engineering, Minor in Computer Science, GPA: 3.44/4.00 Golden, CO

Honors: Dean's List (Fall 2022, Fall 2024, Spring 2026), Honor Roll (Fall 2023, Spring 2024, Fall 2025)

Scholarships: Provost Scholarship, C-MAPP Scholar 2023–2025, American Bureau of Shipping Scholar 2024–2025

Graduate coursework: Estimation Theory & Kalman Filtering (A)

Relevant coursework: Digital Signal Processing, Modern Control Design, Feedback Control Systems, Information Systems Science I/II, Embedded Systems, Engineering Electromagnetics, Elements of Computing Systems

Organizations: IEEE-HKN, IEEE Member

Experience

Embedded Software Engineer, SpaceX Jul 2026 – Present

C, C++, Python, Linux, Git Bastrop, TX

- Cut a phased array antenna calculation's run time 11% fleet-wide by designing a new algorithm
- Own and optimize the antenna transmit-power (EIRP) calculations that the RF and silicon teams use
- Took a new board revision from bare board to talking to satellites in under a day, far faster than before
- Responsible engineer for the phased array software on 2 board revisions and a high-priority production issue
- Write C and C++ software, Linux kernel drivers, and network software that ship on Starlink customer hardware
- Review schematics, run Python hardware-in-the-loop tests on real boards, and verify RF calibrations

Software Engineering Intern, Kratos Defense Jun – Aug 2025

C++, Python, MATLAB, SIMD, Git Colorado Springs, CO

- Made legacy real-time C++ signal processing code 1.6x faster with VTune profiling and AVX-512 vectorization
- Researched faster FIR filter code and presented its speed trade-offs, which informed the team's later DSP work
- Built a color-coded C++ logging and test framework, adopted by every C++ team, that sped up debugging
- Verified the DSP code's outputs, such as power spectral density plots, in Python and MATLAB

Mathematics Course Grader, Colorado School of Mines Jan – Aug 2024

Differential Equations, Calculus II Remote

- Graded coursework for 30 to 50 students a semester across 1 or 2 classes

Substitute Teacher, Fairfax County Public Schools 2024

Seasonal Fairfax County, VA

- Substitute taught STEM subjects at secondary schools across Fairfax County Public Schools

Peer Mentor, Colorado School of Mines Aug – Dec 2023

First Year Success Seminar, Oredigger Camp Golden, CO

- Co-taught a 30-student section of a 1-credit seminar for first-years on adjusting to Mines' academic rigor
- Co-led a group at Oredigger Camp, the weeklong orientation for all first-years

Projects

Nonlinear State Estimation for the EMBR Damper (graduate course), MATLAB, Simulink Spring 2026

- Modeled a magnetorheological (MR) bike damper, coil, and sensors as a 4-state nonlinear system in Simulink
- Estimated the terrain force, which no sensor measures, with extended (EKF) and unscented (UKF) Kalman filters
- Kept every estimated state inside its 3-sigma bound while the coil current stepped from 1 A to 2 A
- Tested the filters on a simulated trail of 1.5 Hz roughness, 8 Hz chatter, random noise, and two obstacle hits
- Found after the course that the UKF wins only with a larger yield constant and a wider sigma-point spread
- Traced a slight EKF lag on the terrain force to the 8 Hz chatter, which the discrete model leaves out

Electromagnetic Bicycle Damper (EMBR), MATLAB, Python Fall 2025 – Spring 2026

- Owned the electromagnet design and calculations for an 8-person capstone team advised by Dr. Aubrey Wigner
- Designed a 160-turn coil of 26 AWG copper on a 9 mm steel core, run at about 2 A from an 8 V supply
- Predicted a 0.15 T peak field at 2 A in Python by summing the field of each coil turn (Biot-Savart law)
- Confirmed the design in MATLAB PDE Toolbox electromagnetic simulations after the first-pass Python estimate
- Redesigned the flux path so the field crosses the fluid gap at a right angle, after the first design barely responded
- Felt the electromagnet change the damping in physical tests, a change the dyno could not measure

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

- Showed the FFT pitch detector runs 2.68x faster than autocorrelation (ACF), averaging 0.22 ms per audio frame
- Pair-programmed the FFT detector, using a zero-padded 8192-point FFT and parabolic interpolation between bins
- Built the real-time MATLAB pipeline that feeds live 48 kHz audio, downsampled to 8 kHz, to both detectors
- Showed the FFT detector kept tracking about 200 Hz past the ACF in a chirp (rising tone) sweep

Gantry Crane Control System, MATLAB, Simulink Fall 2025

- Found the crane's 3.7 m effective cable length by fitting the model's swing to measured crane data in MATLAB
- Moved a simulated crane's load 1 m with no overshoot by co-designing a 50 Hz digital (z-domain) controller
- Predicted a 0.52 s delay limit from the 48-degree phase margin, then confirmed it in simulation
- Settled the load in under 4 s, against a 5 s spec, with a pair-programmed LQR controller and observer
- Designed the observer with LQR so its poles ran about 6x faster than the controller's and its error died out first
- Removed the overshoot at a cost of 12.7 degrees of phase margin with pair-programmed integral anti-windup

Autonomous Maze-Navigating Robot, Python Fall 2025

- Co-built the OpenCV vision system for a 4-person maze robot that posted the second-fastest time in its cohort
- Estimated the distance and angle to each printed marker in real time with OpenCV ArUco detection
- Split the 640x480 vision pipeline into 4 threads so the Arduino motor controller no longer waited on it
- Fixed an I2C packet mismatch with the Arduino by repacking 8-byte Python doubles as 4-byte little-endian floats