

Jack Fraley

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<https://github.com/jackefraley>

Education

Oregon State University, Corvallis, OR

- **Bachelor of Science in Electrical and Computer Engineering**, Minor in Computer Science - 2026
- **Master of Engineering in Electrical and Computer Engineering**, Expected 2027

Relevant Coursework

- **Signal Processing & Systems:** Signals & Systems, Digital Signal Processing, Linear Systems, Stochastic Signals & Systems
- **Optimization, Probability & Statistical Learning:** Nonlinear Optimization, Probability & Random Signals, Statistical Machine Learning Theory, Computational Tools
- **Computer Systems:** Computer Architecture, Operating Systems, Computer Organization & Assembly Language

Skills

- **Programming & Scientific Computing:** C/C++, Python, MATLAB
- **Signal Processing & Estimation:** FFT implementation, FIR/IIR filtering, spectral analysis, stochastic signal analysis, Kalman and Wiener filtering, particle filtering
- **Hardware & Embedded Systems:** Analog signal conditioning, low noise analog front end design, power supply design
- **FPGA & Digital Design:** Quartus Prime, ModelSim, FPGA development workflows

Projects

Three-Axis Coil for Remote Sensing (Capstone Team Project)

- Designed and implemented a three axis magnetic sensing front end for detecting underwater cables and pipes using orthogonal coil geometry.
- Designed low noise analog front end circuitry for weak signal amplification and stable measurements.

Particle Filter for Magnetic Field Source Localization (Independent Project)

- Implemented a particle filter in Python (NumPy) to estimate position and direction of a current carrying wire from simulated two sensor magnetic field measurements, using the Biot-Savart law as the measurement model.
- Reduced dimensional redundancy of the state space by canonicalizing each particle's position onto the plane perpendicular to its direction vector.
- Validated on 100 Monte Carlo trials: 72% of trials converged within 1 unit and 5 degrees; median position error of 0.23 units and median direction error of 0.9 degrees. Outliers are characterized as a multimodal failure mode resulting from symmetric sensor geometries.

Experience

Judicial Council Chair, Associated Students of Oregon State University (ASOSU), July 2024 - Present
Analyzed complex constitutional questions and authored opinions that reflect rigorous logic and clarity. Demonstrated precision in communication and collaborative decision-making under scrutiny.

Project Engineer Intern, Whiting-Turner, June - September 2025

Reviewed and interpreted electrical and communications infrastructure drawings including single line diagrams and telecom layouts to support quality assurance on large-scale construction projects.