

Timothy James Ewing

US Citizen

timjewling@gmail.com

Seattle, Washington

Cell: 720-442-2928

Website: <https://tim.fish>

EDUCATION

University of Colorado Boulder

2016 - 2021

Bachelor of Science - Engineering Physics

EXPERIENCE

Software Developer, Toro Robotics, Longmont, Colorado

2021- Present

- Developed complex path planning algorithms for autonomous landscaping robots in Python.
- Built a modular, reusable, and scalable pipeline for path planning using Docker, Pulsar, Golang, and Python.
- Designed a novel projection from 3D surfaces to 2D for planning paths on variable-height terrain.
- Met two-year functionality goal for path planning in less than a year.

Flight Controller, Southwest Research Institute, Boulder, Colorado

2017 - 2021

CYGNSS - NASA Earth System Science Pathfinder Mission

- Reviewed and analyzed data to answer technical questions about satellite health and constellation status.
- Performed real-time commanding during safe-mode recovery operations.
- Replayed error data while solo-staffing a ground station pass during an unexpected spacecraft fault.
- Doubled satellite contact cadence and improved data delivery time through automated data validation and replay with Python and bash scripts.

LUCY - NASA Discovery class mission

- Developed a Django/Python based tool for planning instrument observations.
- Worked with a small team to quickly iterate on UI/UX changes in response to feedback.

Mission Non-Specific Work

- Developed a web interface for an in-house orbital trajectory analysis tool (Lambert solver).
- Translated concepts from Fortran to Python to help teach established scientists.

Software Developer, Left Hand Robotics, Longmont, Colorado

2016 - 2017

- Developed software for controlling a snow clearing robot.
- Programmed a Raspberry Pi using Python and ROS. Software tasks included base station to robot communications and motor/pneumatic control algorithms.

Software Team Member, FIRST Robotics Team 1619

2012 - 2016

- Worked with a team to develop a semi-autonomous robot for a FIRST robotics competition.
- Developed code which won the Innovation in Controls Award at the 2016 Colorado FRC Regional.

ACCOMPLISHMENTS

Independent Study, New Horizons

- Designed an optical filter conversion algorithm for unresolved Pluto and Charon observations.
- Implemented least-squares Fourier series fit to analyze Pluto/Charon phase curve.
- Built a modular, testable pipeline in Python.

Independent Study, MAXWELL Cubesat

- Worked with the University of Colorado Nanosat Program on MAXWELL, a 6U cubesat designed to test S-Band and X-Band antennas.
- Developed validation and calibration methods for a 6-axis gyro/accelerometer.
- Defended conclusions at a Technical Interchange Meeting with NASA personnel.

RELEVANT COURSEWORK

- **Physics:** Classical Mechanics I-II, Electricity and Magnetism I-II, Quantum Mechanics I-II, Thermodynamics and Statistical Mechanics I
- **Mathematics:** Statistics I, Calculus I-III, Linear Algebra I, Differential Equations I, Differential Geometry
- **Computer Science:** Data Structures, Computer Systems, Data Science, Algorithms

PUBLICATIONS

Django as a Mission Planning Tool Interface for the CYGNSS Mission

Ewing, Timothy; Redfern, Jillian; Alexander, Amanda; Medina, Richard; Birath, Emma;
2021 IEEE Aerospace Conference

Lucy Science Planning: Incorporating Lessons Learned from over a Decade of Space Ops Experience

Medina, Richard; Birath, Emma; Ewing, Timothy;
2021 IEEE Aerospace Conference

When You Have More Satellites Than People: The Evolution of CYGNSS Flight Operations

Medina, Richard; Redfern, Jillian; Wells, William; Birath, Emma; Lamb, Derek; Alexander, Amanda; Ewing, Timothy;
2019 IEEE Aerospace Conference

TECHNICAL SKILLS

Skill	Active Use	Years of Experience	Experience Level
Python	2014 - Present	8	Specialist
git	2012 - Present	10	High
Unix Shell (BASH)	2012 - Present	10	High
C++	2014 - 2017	4	Moderate
Java	2012 - 2018	7	Moderate
Go	2021 - Present	1	Moderate
MATLAB	2017 - 2021	4	Moderate
Javascript, HTML	2016 - 2021	5	Moderate
Solidworks, Fusion 360	2015 - 2020	5	Moderate