

# Grant Nations

## EDUCATION

### University of Utah, Salt Lake City — BS Computer Science, Physics Minor

FALL 2019 - SPRING 2024

- 4.0 major/3.99 cumulative GPA
- UROP Scholar, Fall 2023
- 7x scholarship recipient
- National Merit Commended Scholar
- Varsity Swim and Dive student athlete, Fall 2019 - Spring 2021

## WORK HISTORY

### University of Utah College of Engineering — Robotics Research Assistant

JULY 2023 - PRESENT, SALT LAKE CITY, UT

- Design and run various experiments to determine changes in thrust and thrust efficiency of electroaerodynamic devices as a result of ground and ceiling proximity effects.
- Design and fabricate quad thruster fuselages via stereolithographic printing to isolate specific aerodynamic phenomena in experiments.
- Write multithreaded testing scripts in Python to simultaneously control a power supply, oscilloscope, 3D printer, and load cell used in experiments.

### KBR — Operations Research Engineering Intern

AUGUST 2022 - PRESENT, SALT LAKE CITY, UT.

- Research and develop parallelized scheduling algorithms implementing logic-based benders decomposition for the observation of Earth-orbiting satellites.
- Optimize code to reduce approximately 400,000 sensor transition time calculations from over 1 hour to under 4 seconds.
- Use the Pyomo and GEKKO optimization libraries to construct and solve mixed integer, integer, and binary programming scheduling models.
- Write robust unit tests, run code coverage reports, and profile expensive operations to ensure fast and reliable code.
- Communicate progress and discuss future direction in team standup meetings.

### University of Utah College of Science — Physics and Astronomy Network Mentor

AUGUST 2022 - JUNE 2023, SALT LAKE CITY, UT

- Introduce new program initiatives such as industry-focused discussion topics to help students achieve their career goals.
- Prepare and lead group activities for freshman students to explore their opportunities within the Physics and Astronomy department and university.
- Serve as a mentor to freshman students to aid in their navigation of career paths, academics, and the university.

## PROJECTS

### Abysm X-Bot | Python, OpenAI API, Selenium, X Dev Platform

- Build an X (Twitter) bot that automatically scrapes top US news sites and reports on daily events.
- Interact with OpenAI's GPT 3.5 API for site summaries and tweet generation.
- Scrape hundreds of news articles daily using a headless Selenium Firefox browser.

### Pupil | React, Redux, Django, Raspberry Pi, Celery, Amazon S3

- Lead a team of three students working on a hardware/software solution to streamline the use of hybrid classroom technology for professors and students on college campuses.
- Prototype automated video recording system using a Raspberry Pi, Django, and Celery.

[www.grantnations.io](http://www.grantnations.io)

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## PUBLICATIONS

Empirical Study of Ground Proximity Effects for Small-scale Electroaerodynamic Thrusters  
Grant Nations, C. Luke Nelson, and Daniel S. Drew; Submitted to ICRA 2024

An Integer Programming Approach to Observation Scheduling for Space Domain Awareness  
Grant Nations and Justin Fletcher; To appear in IEEE Aerospace 2024

## TECHNICAL SKILLS

### Languages

C, C++, Python, Java, MATLAB, C#, Javascript, Typescript, HTML, CSS, G-code

### Frameworks/RTEs/Libraries

NumPy, PyTorch, Astroplan, Pyomo, Redux, React, Qt, Express, Node.js

### Tools

SolidWorks, AWS, Git, Github, Docker, CodeCommit, Firebase, Stripe, Amplify, Netlify, Heroku

## SOFT SKILLS

Creativity, communication, teamwork, problem-solving, leadership, adaptability, responsibility

## ADVANCED COURSEWORK

- Human-AI Alignment
- Machine Learning
- Deep Learning
- Interactive Computer Graphics
- Computer Security
- Computer Systems

## CERTIFICATIONS

- Machine Learning, Data Science and Deep Learning with Python, Udemy
- Mechanical Design Associate (SolidWorks), Dassault Systèmes
- 2021 Complete Python Bootcamp from Zero to Hero in Python, Udemy
- Complete Web Development Bootcamp, Udemy