

Aidan Velleca

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EXPERIENCE

Flight Dynamics Intern

Mar. 2025 – Jun. 2025

AstroForge Inc.

Seal Beach, CA

- Automated weekly NASA API data pulls via Docker-based cron job on Google Cloud, updating SQL target database and notifying the team via Slack bot
- Performed trade study with Ansys ODTK, wherein measurements were simulated with a reference trajectory and ground station bias models, and orbit determination was used to analyze covariance trends and determine sufficiency of tracking network for new mission
- Incorporated multithreading into routine to speed up Lambert solve process

GNC Engineering Intern

May 2024 – Jul. 2024

Northrop Grumman

Dulles, VA

- Enhanced in-house C++ simulator to include new truth values in reference frames necessary to support docking
- Introduced a lighting requirement to ensure that spacecraft camera is not facing the sun for too long when within docking range
- Created a new, more robust distance-finding algorithm to avoid spacecraft collisions and trigger abort procedure

Research and Development Intern

May 2022 – Aug. 2022

SprintRay

Los Angeles, CA

- Engineered a new mirror calibration tool for 3D printers with Solidworks to make more precise adjustments
- Designed model to simulate layer distortion from poor calibration and output correction process

EDUCATION

Purdue University

West Lafayette, IN

B.S. in Aerospace Engineering, Minor in Computer Science, GPA 3.1/4.0

Jun. 2020 - Dec. 2024

PROJECTS

Home Server | Docker, Linux

Jul. 2025 – Present

- Built and actively maintain a small home server running Ubuntu Server to provide myself and my family with over 20 useful self-hosted services
- Configured drives in a RAID 1 configuration to ensure parity, ensured remote access with Tailscale VPN
- Managed access to self-hosted services at my own domain via internal DNS and Caddy reverse proxy, implemented Authelia for single sign-on (SSO) capabilities for applicable services

Satellite Viewing Tool @ <https://www.skyviewer.dev> | Python, Flask, AstroPy

Sep. 2024 – Nov. 2024

- Designed a service that pulls from NASA and OpenAI APIs to provide users with information such as orbital elements and ground tracks of over 20,000 LEO satellites
- Utilized AstroPy library to calculate satellite parameters

LEADERSHIP AND ORGANIZATIONS

Treasurer

Aug. 2024 – Dec. 2024

Purdue Spanish Club

West Lafayette, IN

- Managed club budget, lead meetings in event of president's absence, organized fundraising dinner

Programmer

Sep. 2023 – May 2024

Purdue Special Interest Group Game Design

West Lafayette, IN

- Programmed player turret support system in C# in Unity game engine

SKILLS

Languages: MATLAB, C, C#, C++, Python, SQL, HTML, CSS

Libraries: Pandas, AstroPy, Multithreading, NumPy

Interpersonal: Technical Writing, Communication, Teamwork, Leadership

Technical: Docker, Ubuntu Linux, Git, SolidWorks, Excel, Google Cloud Platform, Flask, Ansys ODTK, GMAT, 3D Printing, Kalman Filters, WordPress