

# Brett Duncan

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## EDUCATION

### University of Minnesota - Twin Cities

Graduated May 2023

Bachelor of Computer Engineering

Minor in Astrophysics

**EE Coursework:** Microcontrollers; FPGAs; Digital Design; Signals & Systems; Analog Electronics; Senior Design

**CS Coursework:** Operating Systems; Computer Architecture; Data Visualization; Robotics; Sensing & Estimation

**Astrophysics Coursework:** Orbital Mechanics; Physics of Matter; Intro to Astrophysics

**Programming Languages:** Python, C++, C, C#, F#

## EXPERIENCE

### SpaceX (Hawthorne, CA)

June 2022 – August 2022

Software Engineer Intern, Starship Software Infrastructure

- Improved modeling software to streamline engineers' workflows and improve productivity.
- Investigated performance issues with Hardware-Out-Of-The-Loop tests and worked with engineers to make fixes.
- Developed a linter tool to help avoid runtime errors as a result of improper model setup.
- Analyzed algorithm performance and introduced targeted optimizations.
- Debugged physics models and implemented changes to improve the correctness of simulations.

### Tesla (Palo Alto, CA)

September 2020 – July 2021

Intern, Low Voltage System Validation

- Debugged, maintained, and wrote automated tests and supporting code to improve test coverage and reliability.
- Reviewed automated test results to confirm there were no vehicle behavior regressions.
- Worked with developers and integration engineers to reproduce bugs, validate bug fixes, and test new features.
- Brought up automated testing for multiple new vehicle platforms which was then used to run dozens of nightly tests.
- Wrote firmware for a new tester that allowed for the use of fewer boards, reducing the number of points of failure.
- Developed software to detect hardware failures in the test setup allowing for quicker fixes and greater uptime.

### University of Minnesota Solar Vehicle Project (Minneapolis, MN)

Mentor

May 2022 – May 2023

- Providing feedback on the design and implementation firmware, system level architecture, and PCBs.

Director of Engineering & Co-President

May 2020 – September 2021

- Coordinated over 50 engineering students spread among four sub-teams to get work completed on time.
- Collaborated with team members to architect system level behavior and prioritize development and testing tasks.

Electrical Engineer

September 2018 – May 2022

- Assembled a new high-voltage Li-Ion battery pack, helped to assemble and test at the submodule and module level.
- Developed a CAN interface and HITL testing tools for team members to use while developing firmware.
- Implemented a physics simulation to calculate energy usage, allowing for the analysis of different race strategies.

Engineering Team Member

September 2018 – May 2022

- Competed in the 2021 Formula Sun Grand Prix and American Solar Challenge where I worked on electrical systems.
- Spent hundreds of hours working to complete carbon fiber and fiberglass composite layups for the car's shell.
- Traveled to Australia for two months to work on the car and race in the 2019 Bridgestone World Solar Challenge.

### Vital Images, Inc. (Minnetonka, MN)

Software Engineer Intern, Advanced Visualization Infrastructure

May 2020 – August 2020

Software Engineer Intern, Solutions Engineering

May 2019 – August 2019

### University of Minnesota Department of Computer Science (Minneapolis, MN)

January 2020 – May 2020

Undergraduate Teaching Assistant, CSci 1933 - Introduction to Algorithms and Data Structures