Brett Duncan

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EDUCATION

University of Minnesota - Twin Cities   **Expected Graduation 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)   September 2018 – Present
Mentor
- 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
- 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
- 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 Algs and Data Structures