

# JUSTIN HUMPHREYS

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## PROFESSIONAL SUMMARY

Dedicated mechanical engineering and computational math student equipped with over 6 years of engineering and leadership experience through internships and projects. Seeking opportunities to tackle critical challenges and drive meaningful solutions.

## EDUCATION

### University of California, Los Angeles (UCLA)

Los Angeles, CA

*Bachelor of Science (B.S), Mechanical Engineering*

*Expected June 2026*

- Courses: Advanced Mechanics of Materials, Fluid Mechanics, Thermodynamics, Circuits, Modeling of Dynamic Systems

*Bachelor of Science (B.S), Mathematics of Computation*

- Courses: Data Structures, Computer Architecture, Linear Algebra, Diff. Equations, Analysis, Numerical Methods

## SKILLS

Software: Siemens NX, SOLIDWORKS, ANSYS, EPLAN, Onshape, Linux/Unix, Git

Programming: Python, C/C++, Java, MATLAB, Arduino, STM32, Bash, JavaScript, HTML, CSS

## EXPERIENCE

### SpaceX

Bastrop, TX

*Hardware Reliability Engineering Intern*

*June 2024 - September 2024*

- Developed automated IPX9 test chamber capable of spraying water at 3500 PSI, 6 GPM, and 98°C to recreate extreme cleaning conditions for consumer-grade satellite equipment, designed using Siemens NX
- Commissioned custom 480V PLC control panel using EPLAN Pro Panel, with two VFDs to drive pump motors, servo controller to drive a turntable, and solid state relay to power tank heaters
- Implemented PLC program and HMI using Beckhoff TwinCAT software, used to automate tests and maintain temperatures
- Finished test chamber was 30% cheaper than quoted alternatives, while providing higher pressure and temperature spray, as well as seamless integration with SpaceX telemetry infrastructure
- Created IPX8 test chamber to simulate water immersion up to 3.5 meters depth for Starlink user terminal testing

### Formula SAE: Bruin Racing

Los Angeles, CA

*Software Lead (EV)*

*June 2024 - Present*

- Leading software subteam in developing and implementing an STM32 based vehicle control unit (VCU), live telemetry and data logging firmware with a Compute Module 4, and data visualization software using InfluxDB and Grafana
- Programmed custom battery management system to monitor battery state of charge, health, temperatures, voltages, currents, and communicate with VCU to manage charging and regenerative braking torque requests using a Teensy 4.1

*Controls Lead + Brakes & Pedalbox Responsible Engineer (EV)*

*May 2023 - June 2024*

- Defined data-driven goals and directed a subteam of 6 engineers responsible for design, testing, and integration of all safety-critical systems, including brakes, steering, and ergonomics
- Optimized braking subsystem performance through MATLAB simulations and ANSYS finite element analysis, reducing overall subsystem weight by 12% while increasing stopping power by 21%
- Created heat transfer model in ANSYS to simulate brake rotor heat dissipation, used to determine optimal geometry

*Controls + Powertrain General Member (Internal Combustion)*

*September 2022 - May 2023*

- Calibrated flat-foot shifting and launch control using sensor feedback, contributing to 0.19s faster acceleration
- Tuned fuel maps and ignition timing for optimized performance, increasing horsepower from 45hp to 68 hp

### First Robotics Competition: Team 7461

Redmond, WA

*Electronics Lead*

*August 2018 - September 2022*

- Designed and assembled robust electrical and control systems, achieving a 0% failure rate during 2022 season by prioritizing serviceability and reliability and following industry standard wiring practices
- Developed and enforced pre-match and post-match checklists to validate electrical and mechanical functionality, enabling rapid inspection, testing, and repair of robot within a 5-minute turnaround between matches

## PROJECTS

### Project Car: 1991 Mazda Miata

- Performed complete powertrain overhaul, including a custom tuned MegaSquirt 3 ECU, engine replacement, custom transmission mounts, and upgraded drivetrain components to handle more torque

### BruinsOnBoard

- Constructed a platform for UCLA students to find and join rideshares to/from LAX with authentication, real time data updates, and email notifications using React.js and MongoDB

### Eagle Scout Project

- Engineered and built six produce washing stations for a local food bank, expediting beet harvest process