Julian Barbera

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Education

University of California, Santa Cruz *Expected June 2027*

B.S. Electrical Engineering

Relevant Coursework: Physics Series, Computer Systems and Assembly Language, Intro to Cybersecurity

Technical Skills and Interests

Languages: C, C++, Python, Java, JavaScript, LaTeX
Areas of Interest: Power Systems, Circuit Analysis, Embedded Systems Development
Software: Altium Designer, Altium Nexus, KiCad, OnShape, Fusion360, Vim, Linux, Ubuntu, Docker, Confluence, Jira, Arena PLM, Ansys SIWave, Ansys EDT
Soft Skills: Teamwork, Team Management, Analytical Thinking, Attention to Detail, Effective Communication
Tools: Micro Soldering, Hot Air Reflow, Laser Cutting, 3D printing
Positions:UCSC Hivestorm Cyber Defense Coach, SLUG Linux User Group President, Rocket Team Avionics Lead

Experience

Avionics Intern *March - June 2025*

Astranis San Francisco, CA

- Designed custom hardware platforms for avionics development, achieving an average prototype turnaround time of 3 weeks across 10+ design cycles
- Created complex multi-layer PCB layouts (up to 10 layers) featuring controlled impedance traces and length-matched differential pairs for high-speed interfaces including Ethernet and RS-422
- Engineered EHF RF boards operating up to 30GHz, integrating digital logic and analog front-end components to support signal distribution
- Led collaboration with 3+ domestic PCB fabrication and assembly vendors, achieving turnkey delivery timelines under 2 weeks
- Conducted high-speed signal integrity testing using oscilloscopes; captured and analyzed eye diagrams for RS-422, SpaceWire, Ethernet, and precision clock signals across -30°C to +80°C
- Performed electrical simulations for DC IR drop, power delivery networks, and DDR memory interfaces; calculated transistor current gain (β) to validate circuit performance

Avionics Electrical Lead *February 2024 - Present*

UC Santa Cruz Rocket Team Santa Cruz, CA

- Established and led an avionics team in designing a high-power rocket reckoning and active control system. Collaborated with a team of undergraduate students to develop and refine hardware solutions
- Directing a 12-person team in the development of subsystems including ARM-based MCUs, DCDC power systems, ADC processing, and precision MEMS sensors, including integration with a Real-Time Operating System
- Identified and rectified issues efficiently, ensuring adherence to internally set timelines and conformance to progress within other systems in our team
- Creating comprehensive internal and public documentation for electrical and software development, facilitating inter-team project execution

3D Printing Zone Manager *December 2023 - Present*

UC Santa Cruz Slugworks Creatorspace Santa Cruz, CA

- Developed infrastructure, established protocols, and implemented training programs for a public 3D printing space leading to a 50% reduction in equipment downtime and 4x print success rate
- Oversaw training of 500+ students and staff in 3D printing while maintaining a fleet of 10 Bambu Labs 3D printers
- Oversaw operations in a machine shop, creator space, and multiple student organization spaces, optimizing resource allocation and ensuring efficient space utilization
- Adapted role dynamically to meet operational needs, improving responsiveness and operational efficiency

Personal Projects

Blaze Mini *2025*

Flight computer designed for use with TVC systems for solid fuel and ducted rockets

- Designed a fully integrated ARM based flight computer designed to control thrust vector control solid propellant rockets while conducting real-time data processing
- Integrated power management, GPS, LoRa communications, numerous sensors and outputs
- Engineered small form factor PCB designed in KiCad with manufacturing and assembly in mind