Erk Sampat

Electrical Engineering

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SKILLS

- Power electronics
- Analog and digital circuit design
- Circuit simulation (LTSpice)
- High-density PCB design/fab/assembly (KiCAD and Altium)
- Data structures and algorithms; object-oriented programming

- C and C++; git; Linux terminal
- Embedded systems
- Electronics lab equipment
- Technical documentation; LaTeX
- Hardware and software debugging

PROJECTS

[SinESC](#)

Highly efficient brushless motor controller for drones. Supports sensorless field-oriented control for maximal power efficiency, resulting in increased flight time.

[Universal Laser Driver](#)

Low-power laser driver with ultra-wide input and output voltage range. Also built laser pointers of various wavelengths using the Universal Laser Driver.

[Soldering Guide](#)

Comprehensive guide for soldering through-hole components by hand.

RC Drones and Planes

Built and flew remote-controlled drones and planes – primarily first-person-view drones, glider-style airplanes, and nitromethane-powered airplanes. Set up autopilot and Iridium satellite communications for an airplane designed to detect forest fires. Won [first place](#) in tinyML Vision Challenge.

Solid-State Tesla Coil

Converts line voltage to several hundred kilovolts, generating foot-long electrical arcs. Used to demonstrate high voltage and electromagnetic induction.

EDUCATION

University of California, Santa Barbara – B.S., Electrical Engineering (2022–2026)

EXPERIENCE

Power Electronics Intern – Astranis Space Technologies (June–September 2024)

- Designed, tested, and documented a radiation testing board for 16 different high-voltage diodes. Implemented high-voltage biasing, clamping, and transient fault-detection circuitry. Hardware architecture to be reused for future radiation tests.
- Designed a four-channel $80\,\text{V}/60\,\text{A}$ high-side GaN load stepping board for testing flight hardware. Implemented power stage, including linear current ramp soft-starting regime. Also realized under-voltage lockout, over-current protection, and over-voltage protection. Voltage/current telemetry made accessible to the user.
- Wrote a script using Google's openhtf to automate radiation tests for op-amps.
- Assisted in debugging faulty flyback converter in battery management system.

Student Worker – UCSB Department of Physics (April 2023–June 2024)

- Set up labs for all undergraduate physics courses
- Managed inventory; repaired broken test equipment
- Documented lab procedures
- Designed electronics projects for lab curriculum