

David "Blake" Dee

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Mechanical engineer by degree; work history is electrical, software, and test — instrumentation, DAQ, and cross-domain debugging in production environments at Reflect Orbital, SpaceX, and Tesla.

ENGINEERING EXPERIENCE

Reflect Orbital | *Mechanical Engineering Intern — Test & Instrumentation* Sep 2025 – Dec 2025

- Owned a space-environment dynamometer end to end — design, build, commissioning, handoff — qualifying flight motor thermals at $\sim 10^{-3}$ torr under arbitrary load profiles; translated engineers' requirements into test configs and pass/fail criteria and trained the team to run it after handoff.
- Built the full electrical and control chain: panels, vacuum passthroughs, and instrumentation for thermocouples, pressure transducers, torque transducers, tachometers, hysteresis brakes, motor controllers, and roughing pumps.
- Wrote Python test orchestration and DAQ with hardware interlocks and software failsafes, plus vacuum-specific failure-mode handling (outgassing, torque limits, ESD).
- Flagged vendor-supplied motors as inconsistent with spec, formed the failure hypothesis, and designed the test campaign that resolved it — data showed they met flight thermal loads, avoiding months of re-procurement and schedule slip.

SpaceX — Starlink Space Lasers | *Manufacturing / Hardware Engineering Intern* Jun 2025 – Sep 2025

- Drove laser harness assemblies from vendor-sourced to in-house production, developing the automation concept to cut costs, lead time, and supply risk during an active production ramp.
- Owned the hardware from first-principles physics through mechanical design, electronics, controls, fabrication, integration, and test — debugging across mechanical, optical, and electrical domains on live production timelines.
- Delivered a working prototype with strong theoretical cycle time; identified remaining yield and robustness risks requiring further iteration before production release.

Tesla — Agile R&D / Special Projects | *Automation Manufacturing Intern* Sep 2024 – Mar 2025

- First intern on the Agile R&D team; scoped and de-risked automation proposals for manual manufacturing processes and delivered an in-production station prototype for Robotaxi.
- Demonstrated a 97% cycle-time reduction versus the existing line through process redesign, automation, and fixture optimization — and presented the result to line operators and stakeholders in their terms.
- Developed five assemblies totaling 300+ parts over 30+ PDM iterations; released 50+ drawings, drafted $\sim$ \$20K BOMs, sourced 100+ components, managed vendors, and welded and assembled the station personally to hit the deadline.

UCLA Rocket Project — Prometheus | *Propulsion Engine Lead* Sep 2023 – Jun 2024

- Led development of five "N"-class SRAD hybrid engines ($\sim$ 600 lbf) to a 15,000 ft apogee — $1.5\times$ the prior club record.
- Ran three remote-site hotfire campaigns (two engines each) and led launch integration — instrumentation setup, data review between runs, and go/no-go calls on hardware readiness in the desert.
- Designed injectors and nozzles with NASA CEA and ANSYS CFD; CNC-machined flight injectors in house and cut engine lead time 50% by training members on lathe and mill to run multiple machines at once, backed by written production manuals.

Seoul National University | *Project Lead* Jul 2023 – Aug 2023

- Built a Python pan-tilt tracking robot and deployed YOLOv3 models on custom-annotated datasets — real-time surgical instrument classification and NSCLC detection in CT imaging — running live on the robot.

Orthopedic Biomechanics Lab, Pasadena | *Published Researcher* Aug 2022 – Dec 2023

- Published, "Biomechanical Characterization of Isolated Acromioclavicular Joint Stability"; 2nd Place Best Academic Paper, 30th Congress of the Korean Shoulder and Elbow Society. Built cadaveric test rigs, ran 50+ specimens, and analyzed data in Rhinoceros 3D and Excel.

ROBOTICS & AUTONOMY PROJECTS

- RAIV autonomous underwater vehicle (UCLA capstone) project lead coordinating mechanical, electrical, and software teams, scope, and timeline; vehicle ran a manual / autonomous / strobe-homing state machine with complementary-filter sensor fusion on a RPi 5.
 - Personally owned RAIV's entire electrical system — dual-battery power architecture, KiCad schematics, sensor integration, harnessing, battery monitoring, and star-ground topology — and debugged the system through integration and in-water testing.
- Thrust-vector-controlled monocopter — designed and built flight hardware; developed IMU-based state estimation and closed-loop attitude control in simulation.
- 6-DOF robotic manipulator — forward/inverse kinematics, trajectory generation, and controls; extended to a simulated auto-PCB placement robot.
- LiDAR-based velocity-estimation payload flown under a parachute for a drag research project.
- 3D-printed cycloidal drives; FPV fixed-wing aircraft — field build, repair, and flight ops.

EDUCATION

University of California, Los Angeles — Samueli School of Engineering Sep 2022 – Jun 2026

- B.S. Mechanical Engineering — Dean's Honors List. Coursework: Controls, Dynamics, and Kinematics of Robotic Systems.

TECHNICAL TOOLKIT

Software: Python, C++, MATLAB, Git

Systems: Controls, kinematics & motion planning, embedded firmware (Raspberry Pi), IMU state estimation & complementary-filter fusion, LiDAR, computer vision (YOLOv3)

Hardware: Electrical troubleshooting, control panel and harness build, sensor instrumentation (TC, PT, torque, tach), motor control, oscilloscope/DMM debug, machining (lathe/mill/CNC), welding

Data & Design: DAQ pipelines, log parsing and test-data analysis/visualization in Python, SolidWorks, Onshape, NX, Fusion 360, KiCad, ANSYS