Kevin Yuan

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Education

Duke University | *Durham, NC* **Aug. 2023 – May 2027**

B.S.E. in Mechanical Engineering, Concentration in Materials Science, Minor in Computer Science *GPA: 4.0/4.0*

- **Relevant Coursework:** Control Systems, Materials Science, Fluid Dynamics, Heat Transfer
- **Honors + Societies:** 4x Dean's List with Distinction, Theta Tau, Duke AERO, Huntsman Cancer Foundation

Professional Experience

Calidar | *Mechanical Design and Analysis Intern* | *Durham, NC* **Jan. 2024 – Present**

- Owned engineering design process for subsystems of novel precision medical device in SolidWorks; rapid prototyped with 3D printing/sheet metal and produced final parts in CNC-machined aluminum and acrylic.
- Performed root cause analysis and ANSYS Mechanical (Static Structural) simulations to quantify rail deformation; isolated and redesigned weak sections, cutting deflection 3.0 mm → 1.0 mm and stabilized motion.
- Implemented a MATLAB–Python diagnostics and operator UI to cut operation cycle from 14 min to <5 min, increasing radiologist throughput and identifying error modes.

BlueStamp Engineering | *Engineering Instructor* | *San Jose, CA* **May 2025 – Aug. 2025**

- Directed development of 10 functional prototypes (gesture robots, rehab devices), guiding teams in CAD-driven design validation, thermal management considerations, and hardware testing from concept to demo.
- Standardized BOM/schematic checklists and prototype-to-demo pipeline, reducing last-stage rework by 78% and ensuring all projects passed demo.

Duke University | *Structures & Properties of Solids TA* | *Durham, NC* **Jan. 2025 – May 2025**

- Led weekly discussion sections for 100+ students on stress–strain behavior, fatigue behavior/life, crystal structures, and phase transformations; achieved >95% positive feedback on TA reviews.
- Co-developed assessments and coordinated grading with two TAs, maintaining <48-hour turnaround and ensuring consistent evaluation standards across the course.

Projects

Acoustic Enclosure Resonance Optimization **Jul. 2025 – Aug. 2025**

- Designed and evaluated five enclosure/brace configurations with SolidWorks and ANSYS (modal and harmonic) analysis to identify first-bending modes and guide the brace layout.
- Raised the first panel mode 0.74 kHz – 1.32 kHz (+77%) by adding cross-rib and baffle-ring braces at modal antinodes on side/baffle panels, reducing midband cabinet resonance.

Battery Health Modeling **May 2025 – Jul. 2025**

- Evaluated battery pulse logs in Python to build a calibrated model and state-of-charge estimate; identified internal resistance and electrical response time directly from data.
- Achieved 3 mV pulse-prediction error on a 10 min dataset and reported practical figures—internal resistance $\approx 0.05\,\Omega$ and response time ≈ 7.5 s—enabling fast health checks and clean parameter handoff.

Dual-Axis Gantry System for X-ray Diffraction Filter Positioning **May 2024 – Aug. 2024**

- Designed and CNC-machined an XY gantry with lead-screw actuation and dual-rod aluminum supports, achieving ±0.1 mm positioning repeatability for laser-diffraction filtering.
- Analyzed single-rod configurations in ANSYS (modal & harmonic), diagnosing instability; redesigned with dual guide rails to reduce vibration amplitude by 70%.

Technical Skills

CAD/CAE: SolidWorks, Fusion 360, ANSYS Mechanical (Static Structural, Modal, Harmonic, Thermal, Fluent), GD&T, Finite Element Analysis (FEA), Mechanical Engineering Principles

Manufacturing & Prototyping: CNC Machining, FDM/SLA 3D Printing, Sheet Metal Fabrication, Laser Cutting, Injection Molding, Design for Manufacture and Assembly (DFMA), Soldering, PCB Assembly, Oscilloscopes/Multimeters

Programming & Hardware: Python (pandas, NumPy), MATLAB/Simulink, Java, C, C++, Git, Arduino, ESP32, Raspberry Pi, SQL