Gilbert Chang

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Education

Purdue University West Lafayette, IN
Bachelor of Science in Mechanical Engineering, Computer Science *Aug. 2023 – May 2027*
Minors: ECE, Mathematics
Relevant Coursework: Machine Design, Statics, Mechanics of Materials, Heat and Mass Transfer, Thermodynamics, Fluid Mechanics, Measurement and Control Systems II, Signals and Systems, Electrical Engineering Fundamentals II

Experience

Ground Systems Intern May 2025 – August 2025
Rocket Lab *Wallops Island, VA*

Undergraduate Research Assistant January 2025 – Present
Cai Group at Herrick Laboratories *West Lafayette, IN*

- Conducting system identification on a dual psychrometric chamber system using MATLAB Control Systems Toolbox, convex optimization, and neural networks to analyze lumped-element model errors.
- Developing workflows for system identification and pole placement to optimize controllers for energy-efficient heat pumps.

Undergraduate Research Assistant November 2024 – Present
Computational Motion, Manipulation, and Autonomy Lab at Purdue University *West Lafayette, IN*

- Engineered a soft robotic gripper using FinRay geometries for the Franka Research 3, employing FEA to predict structural deformation and optimize manipulation precision.
- Designing pneumatic soft end-effectors with integrated tactile sensing to improve robotic adaptability and object interaction.

Projects

Supersonic Sounding Rocket Active Fin Control Module January 2025 – May 2025

- Designed a high-DOF linkage system using SolidWorks, establishing parametric workflows for rapid iteration, and enabling precise servo motor control of canards.
- Analyzed rocket stability, overall coefficient of drag, and mechanical stresses utilizing Ansys Fluent simulations.
- Performed structural FEA in Ansys Mechanical and hand calculations to analyze component deformation and mechanical stresses, informing material choices under aerodynamic and launch loads.
- Applied DFM and DFA principles to reduce the overall module cost by 80%.

High Altitude Solid Rocket Motor November 2024 – January 2025

- Designed a 44kNs solid rocket motor with 210s Isp in Onshape; developed parametric workflows and nozzle geometry optimization using OpenMotor, achieving 98% ideal thrust coefficient.
- Conducted structural analysis with Ansys Mechanical and hand calculations, enforcing a factor of safety of 3.5 for critical load-bearing components.
- Developed ignition electronics using KiCad, optimizing for robust system integration and sensor calibration under noisy conditions.
- Leveraged DFM principles for nozzle, bulkhead, and testing stands, ensuring manufacturability on 5-axis CNC mills.

Technical Skills

Design & Analysis: Onshape, Siemens NX, SolidWorks, Autodesk Inventor, Ansys Mechanical, Ansys Fluent, KiCad
Materials & Manufacturing: Composites (VARTM, forged), GD&T, DFM/DFA, Tolerance Stack-ups
Simulation & Control: FEA, CFD, MATLAB, Simulink, ROS2, Python, C, C++, Java, NumPy, Pandas, Matplotlib
Prototyping & Testing: 3D Printing, Laser Cutting, Vacuum Forming, Manual & CNC Mills/Lathes, Bandsaws