

Jack Zhang

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Education

BASc Mechanical Engineering + PEY Co-op, University of Toronto

September 2023 – April 2028

- Specializing in Mechatronics and Solid Mechanics | Minor in Engineering Business
- Relevant Courses: Engineering Strategies and Practice, Mechanical Engineering Design, Mechatronics Systems, Mechanics of Solids (Finite-element Analysis), Manufacturing Engineering, Computational Fluid Dynamics.

Experience

Mechanical Design Intern, Han's Laser Technology Co – *Shenzhen, China*

May 2025 – August 2025

- Engineered automatic clamping systems for steel-panel laser welding by integrating pneumatic actuation and guide rails, eliminating manual alignment and accelerating shop-floor setup cycles by 20 minutes per batch.
- Diagnosed critical misalignment issues during prototype trials and implemented gantry rail modifications that resolved tolerance stacking errors, improving alignment accuracy and ensuring seamless production ramp-up.
- Produced comprehensive SolidWorks production drawings and Bills of Materials (BOM) to support assembly teams, ensuring a seamless design-to-manufacturing transition that minimized procurement errors and rework.

Aerostructures Designer, University of Toronto Aerospace Team – *Toronto, ON*

September 2023 – Present

- Engineered a non-structural composite airframe for a liquid-propellant rocket, collaborating with propulsion teams to integrate modular panels that facilitated rapid system access during critical pre-launch testing windows.
- Conducted structural optimization using Ansys Finite Element Analysis (FEA), achieving a 15% mass reduction while preserving the necessary stiffness to withstand aerodynamic loads and enhance flight stability.
- Pioneered the transition to negative mould fabrication standards, which cut panel production timelines by 50% and eliminated surface defects, ensuring superior dimensional accuracy for aerodynamic surfaces.
- Directed the division's 3D printing operations for rapid prototyping; established a Notion based job-tracking workflow that accelerated part delivery from 14 days to under 5 days, significantly boosting cross-team iteration speed.

Projects

4-Axis Enclosed 3D Printer

- Engineered a portable 4-axis 3D printer featuring a tri-motor kinematic bed levelling system; this design performs automated mesh calibration to eliminate manual tramming, reducing pre-print setup time by 75%.
- Implemented Klipper firmware with Input Shaping algorithms to suppress resonant vibrations, allowing for doubled print speeds compared to standard Cartesian systems without compromising surface finish or dimensional accuracy.
- Designed an active chamber heating module capable of reaching 70°C in under 10 minutes, effectively mitigating thermal warping and delamination when printing high-performance thermoplastics like ABS, Nylon, and PC.

Macro Photography Camera Slider

- Designed a programmable motorized slider for macrophotography by integrating a Raspberry Pi and stepper motor; developed custom Python scripts to automate complex sequences such as focus stacking and panoramic tracking.
- Optimized the carriage and rail topology specifically for FDM 3D printing, reducing filament usage by 30% while maximizing structural rigidity to eliminate micro-vibrations during sensitive long exposure capture sessions.
- Validated mechanical reliability through rigorous endurance testing, confirming zero step loss over 100+ continuous operation cycles and ensuring sub-millimeter positioning accuracy for professional time-lapse workflows.

Skills

Technical: Ansys (FEA/CFD), CATIA, Fusion 360, SolidWorks, MATLAB, Python, GCODE, GD&T.

Productivity: Excel, MS Office Suite, Google Suite, Google Calendar, Slack, Technical Documentation (ECNs).

Interpersonal: Leadership, Teamwork, Written and Verbal Communication, Problem-Solving, Attention to Detail.