Zachary Gwennap

zacgwennap@gmail.com | Portfolio: zacgwennap.github.io | github.com/zacgwennap

Education

University of California, Berkeley – BS in Mechanical Engineering Dec 2024

Skills

CAD & Design: SolidWorks (CSWP Certified), Fusion 360, Onshape, AutoCAD, Autodesk Eagle
Manufacturing: FDM/Resin 3D Printing, Manual Mill and Lathe, Soldering, Wiring and Assembly
Programming: MATLAB, Python, C++, Git, LaTeX, Linux, Simulink, LabVIEW, GCODE, C/Arduino

Work Experience

Lead Mechanical Engineer, Fierro Fab – Long Beach, CA March 2025 – Present

- Led interdisciplinary engineering projects for vehicle fabrication, managing concept-to-completion processes.
- Reverse-engineered suspension geometry from 3D scans to simulate travel and fit custom billet wheels.
- Engineered a concealed fuel-filler mechanism with a pivoting cam behind the taillight assembly.
- Designed and built a 9x18ft modular fixture table and tooling for precise part alignment.

Ugrad Researcher, Additive Manufacturing and Metamaterials Lab – Berkeley, CA May 2023 – Dec 2024

- Designed and built a multi-material printer prototype that consisted of CAD design, custom software in LabVIEW and Arduino, and a novel resin swapping method.
- Created a MATLAB script to automate the detection and replacement of faulty image projections found in slicing software, a task that was done manually for each model.
- Developed a small scale piezoelectric actuator for use in haptic devices that amplified displacement by 100x.
- In the process for getting published in a paper investigating printing defects in large area 3D printing.

Engineering Intern, NASA – Virtual June 2021 – Aug 2021

- Modified CAD files of the X-59 aircraft aimed at improving 3D print quality of thin features.
- 3D printed and revised models based off input from the NASA model shop.
- Created a paper model kit of the X-59 aircraft used for STEM education.
- Designed a prototype vehicle in SolidWorks to carry an incapacitated astronaut back to a lunar base.

Projects

High Speed 3D Printer github.com/zacgwennap/MoXY-3D-Printer

- Designed and built a 3D printer capable of achieving accelerations 3x faster than any commercial printer.
- Collaborated with CNC services to meet strict GD&T requirements for precision components.
- Engineered and manufactured a metal 3D printed worm gear extruder for high extrusion rates.
- Integrated mixed AC and DC systems in a custom-designed electronics enclosure.

Thrust Vector Controlled Model Rocket github.com/zacgwennap/Model-Rocket-Flight-Simulation

- Constructed a servo actuated thrust vectoring mechanism with $\pm 5^\circ$ of travel.
- Developed and soldered a custom PCB to process data from multiple sensors and control servos.
- Performed parachute ejection tests with a spring-loaded piston, enhancing deployment reliability.
- Simulated flight paths using dynamic mass calculations and rocket angle.

Video Processing and Analysis of 3d Printed Infill zacgwennap.github.io/Misc%20Projects

- Recorded and processed footage of tensile tests in MATLAB to calculate strain.
- Applied error propagation uncertainties and compared acquired data to Instron measurements.
- Honeycomb infill had no significant increase in tensile strength vs. cubic infill, but resulted in approximately 10% higher displacement before fracture.