Luis Trueba

luis@trueba.xyz • 432-231-3869 • Somerville, MA • www.luistrueba.com

Experience

Mechanical Engineer at Formlabs — August 2022– August 2024

- Developed electromechanical systems for Formlabs products for both SLA and SLS product lines.
- Worked with a small team to take the Fuse Blast automated media blaster from the concept phase through to mass production in just over a year
  - Led design of critical machine subsystems, working based on product requirements doc to deliver subsystems meeting strict design criteria with a focus on reliability, serviceability, and process quality.
  - Designed and implemented production pneumatic system, using bench tests and flow analysis to inform final design.
  - Designed sheet metal, machined, injection molded, and SLS 3D printed parts for mass production
  - Iterated top-level machine design and associated documentation based on FDM and DFA feedback from contract manufacturer on tight 2-week iteration cycle.
  - Designed tests and ran IQC to validate prototypes and inform design changes for forthcoming build cycles.
  - Managed hundreds of parts in Product Lifecycle Management software to ensure effective communication of design intent and plan-of-record design between engineers and manufacturers.
  - Worked closely with test and sustaining engineering teams to preemptively identify and mitigate critical failure modes.
- Developed prototype backlight unit for what would become Formlabs' novel Low Force Display print engine
  - Worked closely with optics, thermal, and electrical engineers to design an integrated backlight unit which could effectively constrain LED PCB, a plano-convex lens array, and thermal management system into a compact, user-serviceable package.
  - Designed injection molded lens array and light baffle based on optical team's geometric specifications, and optimized for injection molding best practices. Incorporated features to maintain tight tolerances for lens location.
- Designed and tested early-stage prototypes of a rigid, thermally agnostic, and flat machine structure for use in upcoming SLS systems. Ran FEA simulations and validated with physical test results in order to rapidly iterate and lead system design.

Robotics Engineer at Dexai Robotics — January 2021– June 2022

- Developed electromechanical systems to deliver the "Alfred" salad sous chef robot.
- Lead redesign and maturation of Alfred's end effector and container passer arm subsystems to meet requirements with a focus on reliability, speed, accuracy, sanitary/safety compliance, and cost-effectiveness
  - Implemented compliant stops and actuator mounting paradigms to increase lifetime of actuators and drivetrains
  - Conducted first principles analysis and FEA on load bearing structures to withstand robot to workspace collisions
  - Integrated a suite of sensors (e.g. proximity sensors, thermal camera, depth camera) into a compact space, to improve overall subsystem capability and automate regulatory compliance measures.

Robotics Intern at Dexai Robotics — June 2019 – December 2020

Led design of end effector to transition from pneumatic to electric power and of 2 DoF container passer robotic arm. Delivered functional prototypes to satisfaction of Dexai staff.

Undergraduate Researcher at MIT CSAIL Distributed Robotics Laboratory — September 2018 – January 2019

Designed and built testing apparatus for soft robotic grippers, using CNC machining and 3D printing methods.

Undergraduate Researcher at MIT CSAIL Computational Fabrication Group — June 2017 – December 2017

Designed and developed a library of parametric CAD models, ran Finite Element Analysis simulations, wrote Python code, and prototyped hardware for robots used to demonstrate algorithms for AI-assisted design and construction of carpentered furniture.

Education

Massachusetts Institute of Technology; Fall 2016–Fall 2020 | Mechanical Engineering

Relevant courses: Statics, Mechanics of Materials, Dynamics and Controls, Design and Manufacturing

Publications & Named Inventor Patents

- Co-inventor on patent Pub. No.: US 2020/0086503 A1 entitled "Food-Safe, Washable Interface For Exchanging Tools."
- Co-inventor on patent Pub. No.: US 2021/0122585 A1 entitled "Robotic Systems And Methods For Conveyance Of Items."
- Co-author on conference paper titled: "A Simple Electric Soft Robotic Gripper with High-Deformation Haptic Feedback"
- Co-author on conference paper titled: "Robot Assisted Carpentry for Mass Customization"

Certifications and Skills

CSWP (Certified SolidWorks Professional) — Mechanical Design, Advanced Sheet Metal, Advanced Drawing Tools

Prototyping | Design for mass production | Injection molding | Sheet metal bending & forming | Manual and CNC machining | Laser cutting | Waterjet | 3D Printing | Solidworks | Autodesk Inventor | Onshape | Blender | Microsoft Office | Google Suite | Windows | Mac OS X | Linux | ROS | Python | Bash | Shell scripts | Actuator design | Mechanism design | Finite element analysis | Precision machine design | Soldering | Testing fixture design | Fiber composite layup | Pneumatics | DFMEA | Product Lifecycle Management