



Luis Trueba

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PROFESSIONAL
Mechanical
Design

SOLIDWORKS

Work Experience

Robotics Engineer at Dexai Robotics — June 2021– Present

- Develop hardware systems to deliver the “Alfred” salad sous chef robot: <https://www.dexai.com/media>
- Lead redesign and maturation of Alfred’s end effector and container passer arm subsystems to meet requirements with a focus on reliability, speed, accuracy, sanitarness/safety, and cost-effectiveness
 - Implement compliant stops and actuator mounting paradigms to increase lifetime of actuators and drivetrains
 - Conduct first principles analysis and FEA on load bearing structures to protect from robot to workspace collisions
 - Integrate presence sensors to boost reliability of tool changing system; incorporate thermal scanning sensors to automate regulatory compliance procedures
 - DFMA: follow injection mold design best practices, remove assembly dependencies, and reduce part count
- Led design, test, and integration of automated container denester which presents empty bowls to the robot for filling
 - Specified and integrated actuator that unblocked reliable separation of notoriously tricky container type
 - Delivered subsystem to customer sites which is in use to this day
- Led design of lidding mechanism to automate placement and mating of lid to container
- Form hypotheses, generate and execute test plans, analyze test data, identify root causes, and directly design fixes
- Rework metal and plastic parts with hand and machine tools to rapidly iterate on designs

Robotics Intern at Dexai Robotics — June 2019 – June 2021

Led design of end effector to transition from pneumatic to electric power and of 2 DoF container passer robotic arm. Specified, characterized, integrated, and tested solenoids, DC motors, drivetrains, geartrains, sensors, and PCBAs into custom mechanical housings. Delivered functional proof-of-concept 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 Research Assistant at University of Texas of the Permian Basin COE — June 2018 – September 2018

Created parametric CAD, ran dynamic simulations, and 3D printed an apparatus for demonstrating the effects of resonance in sucker rods on industrial oilfield pumping units.

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

Created a library of parametric CAD models, ran Finite Element Analysis simulations, wrote code, and prototyped hardware for a set of robots used to demonstrate algorithms for parametrically constructing carpentered furniture.

Education

Massachusetts Institute of Technology; Fall 2016–Fall 2020

Mechanical Engineering, Concentration in Controls, Instrumentation, and Robotics

MIT Rocket Team — Member (Fall 2016 – Present), CAD Lead (August 2018 – December 2019)

Worked to design and build a solid-fueled rocket to reach 70,000 feet in altitude. Constructed a combination motor test stand and launch tower for the purpose of completing field operations on the rocket. Organized, maintained, and administrated large collaborative CAD projects.

Publications & Named Inventor Patents

- Co author on patent Pub. No.: US 2020/0086503 A1 entitled “Food-Safe, Washable Interface For Exchanging Tools.”
- Co author 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 | Manual and CNC machining | Laser cutting | Waterjet | 3D Printing | Solidworks | Autodesk Inventor | Onshape | Blender | LabVIEW | Adobe Creative Suite | Final Cut Pro | Microsoft Office | Google Suite | Windows | Mac OS X | Linux | ROS | Python | Bash | Shell scripts | RViz | URDF | Actuator design | Mechanism design | Finite element analysis | Structural calculations | Precision machine design | Linkage design | Surface and through-hole soldering | Testing fixture design | Fiber composite layout