



# 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 App. No.: 62/926288 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