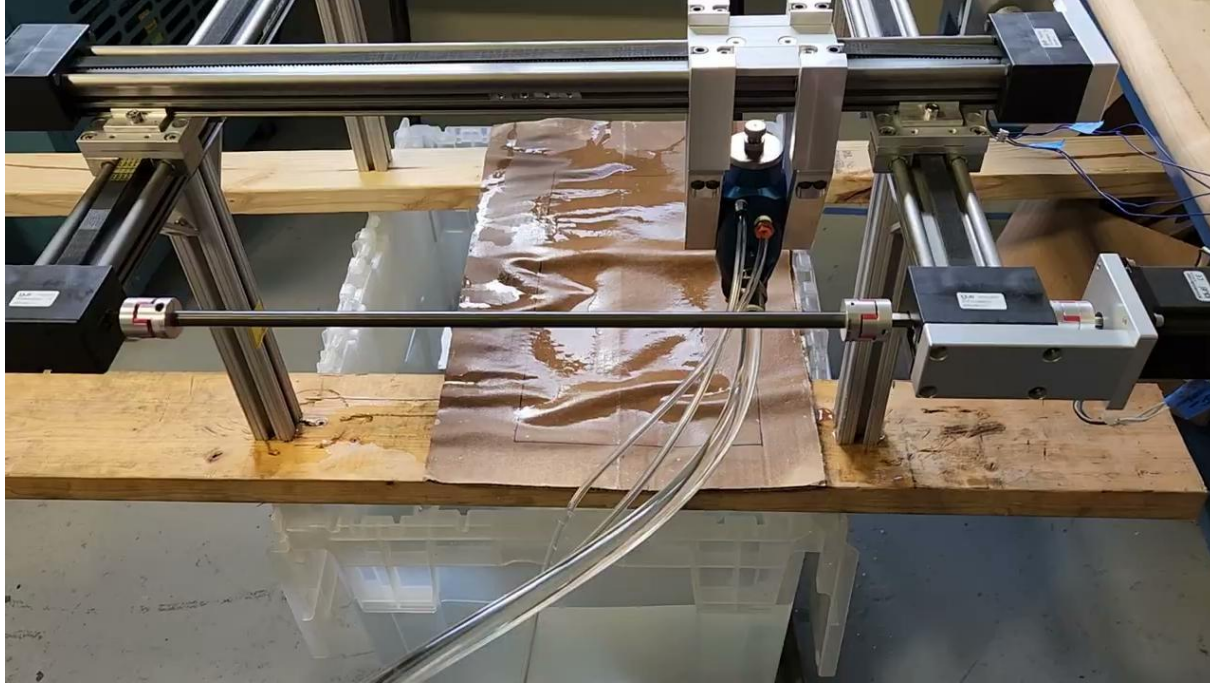


Gesture Based Tracking and Control of AV

Full Demo

- Project with Duckietown DB21J Robot and ROS with Python to autonomously follow human subjects and respond to various poses for navigation
- Control algorithm based on pre-trained 2D Pose Estimation model (Google MediaPipe Pose), gestures detected based on relative angle, orientation, and distance between keypoints
- Link: https://drive.google.com/file/d/18N-yZaStdXHYK03l2xgTzGyOnLlLHTD/view?usp=drive_link

Automated Adhesive Painting System



- Fully functioning prototype waiting to be installed on production floor
- Designed system, selected and wired the gantry, motors, drivers
- Programmed PLC in Arduino C++

https://drive.google.com/file/d/15PyGhKRrNnCefMQgUjGnNgrStjFSXMce/view?usp=drive_link

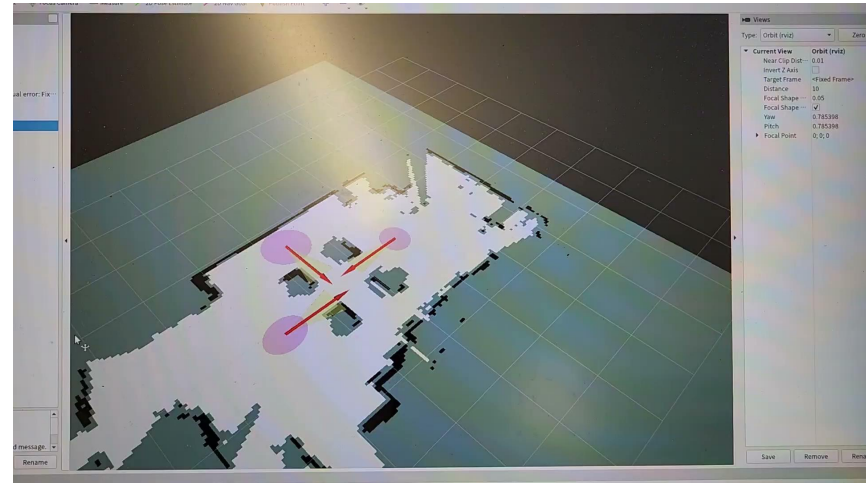
City Intersection Simulation with Multi Agent AV System

Demo:

https://drive.google.com/file/d/17MW4SCXwpkHma77zaApzS7vJrYIKYb0C/view?usp=drive_link

Robot Localization:

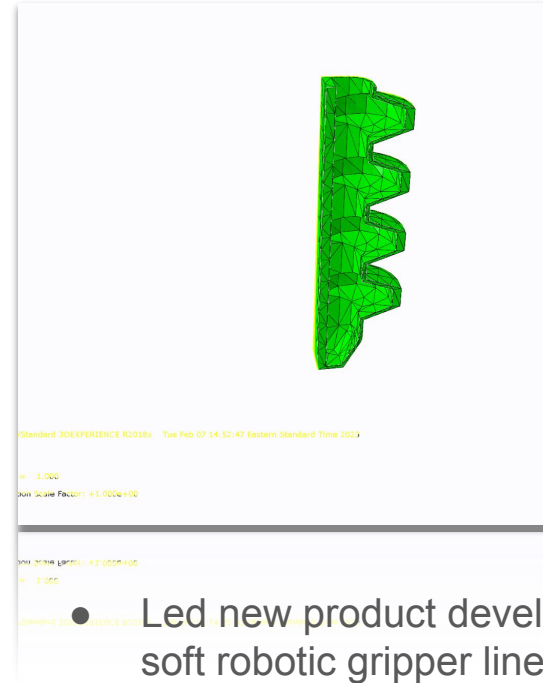
https://drive.google.com/file/d/11Um6nwmL9USbJpMZ8jBJchx45MMUNq6o/view?usp=drive_link



Soft Robotic Gripper Product Prototype

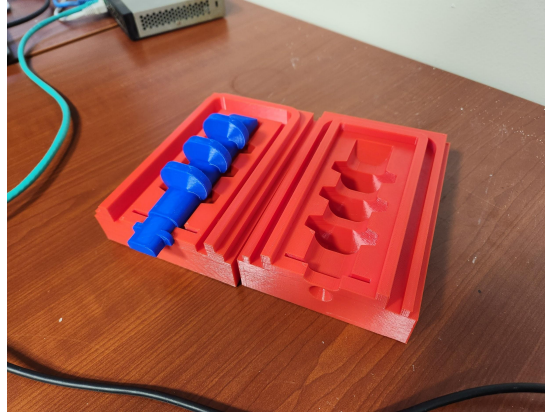
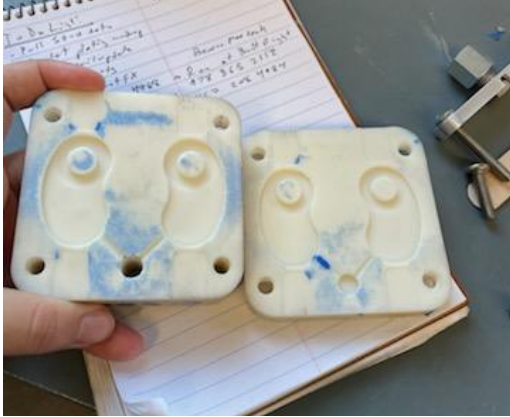


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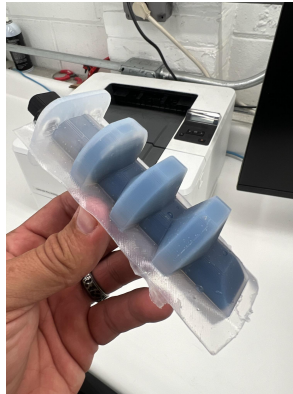
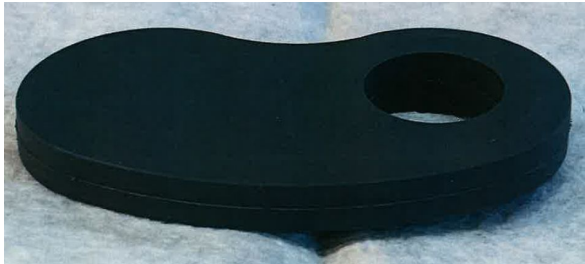


- Led new product development for soft robotic gripper line
- Tested designs through Abaqus simulation and rapid prototyping through 3D printed molds

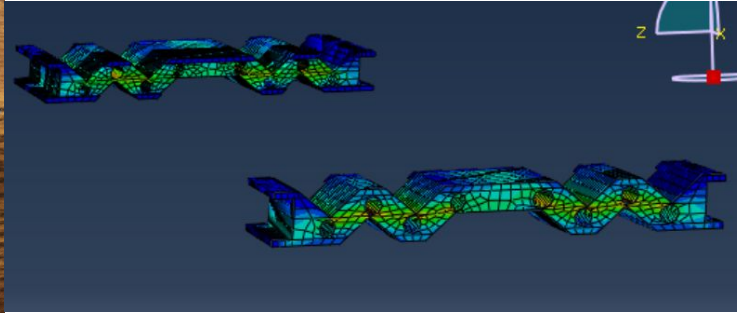
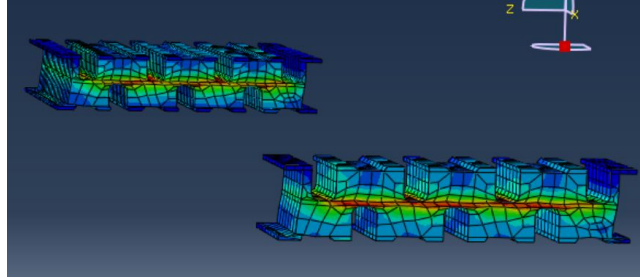
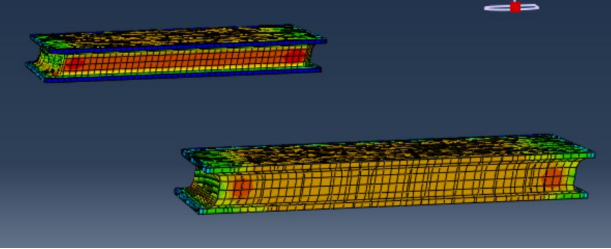
3D Printed Rubber Injection Mold



- Best suited for small, low volume jobs due to time spent heating mold
- SLA printed, with Somos Perform material for high temperature stiffness



Vibration Isolator for Custom Aerospace Application



- Initial parts failed to survive test, multiple design iterations experiments to increase fatigue life and natural frequency
- Metal components not included in simulation since they are much stiffer than the rubber
- Accounting for Natural Frequency, Damping, Max Strain / Fatigue Life, Stress concentrations, Manufacturability
- Final design on top right successfully survives test and passes vibe requirements