FAMU-FSU College of Engineering

Design Review 5

Team 504: Corning's Automated Pallet Topper

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Team Members

Ahmari Avin
Computational Engineer

Brightson Bazile
Systems Engineer

Michael Rodriguez Capera
Manufacturing Engineer

Daniel Mack
Design Engineer

Craig Yox
Materials Engineer

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Sponsors and Advisors

CORNING

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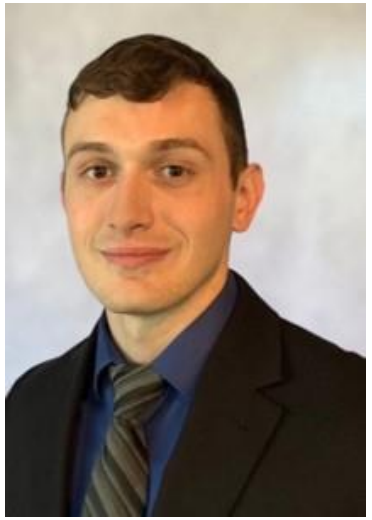
Jeffery Roche
Project Manager



Trent Brush
Project Leader

Christian Hubicki, Ph.D.
Project Advisor

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Michael
Rodriguez

Objective

The objective of this project is to design an automated system to assist in Corning's current palletization and depalletization process through the placement and removal of pallet toppers and embedded foam layers.

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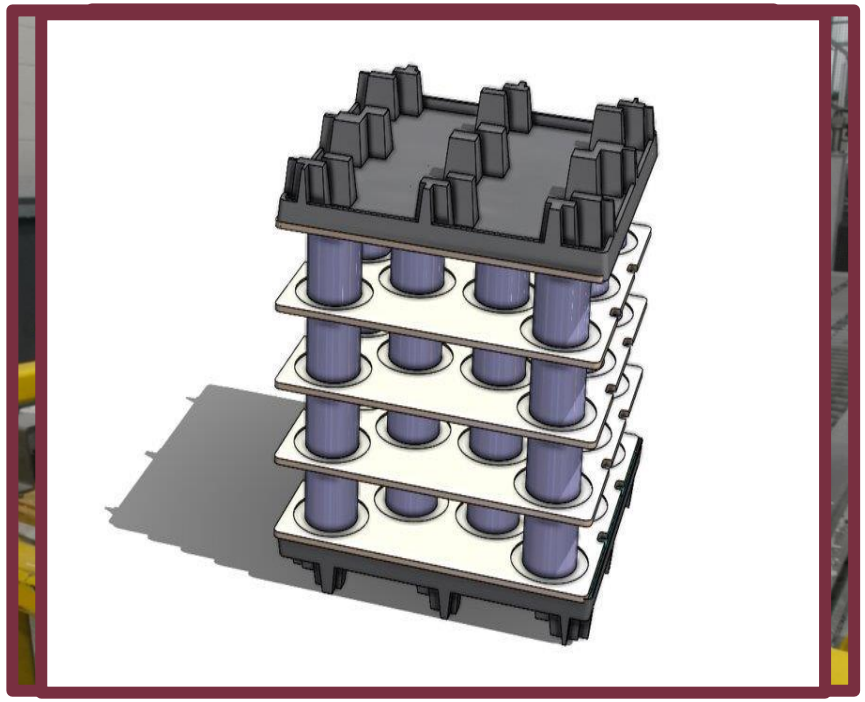
Michael
Rodriguez

Project Overview

The pallet topper (black piece) has to be physically placed and removed by an employee



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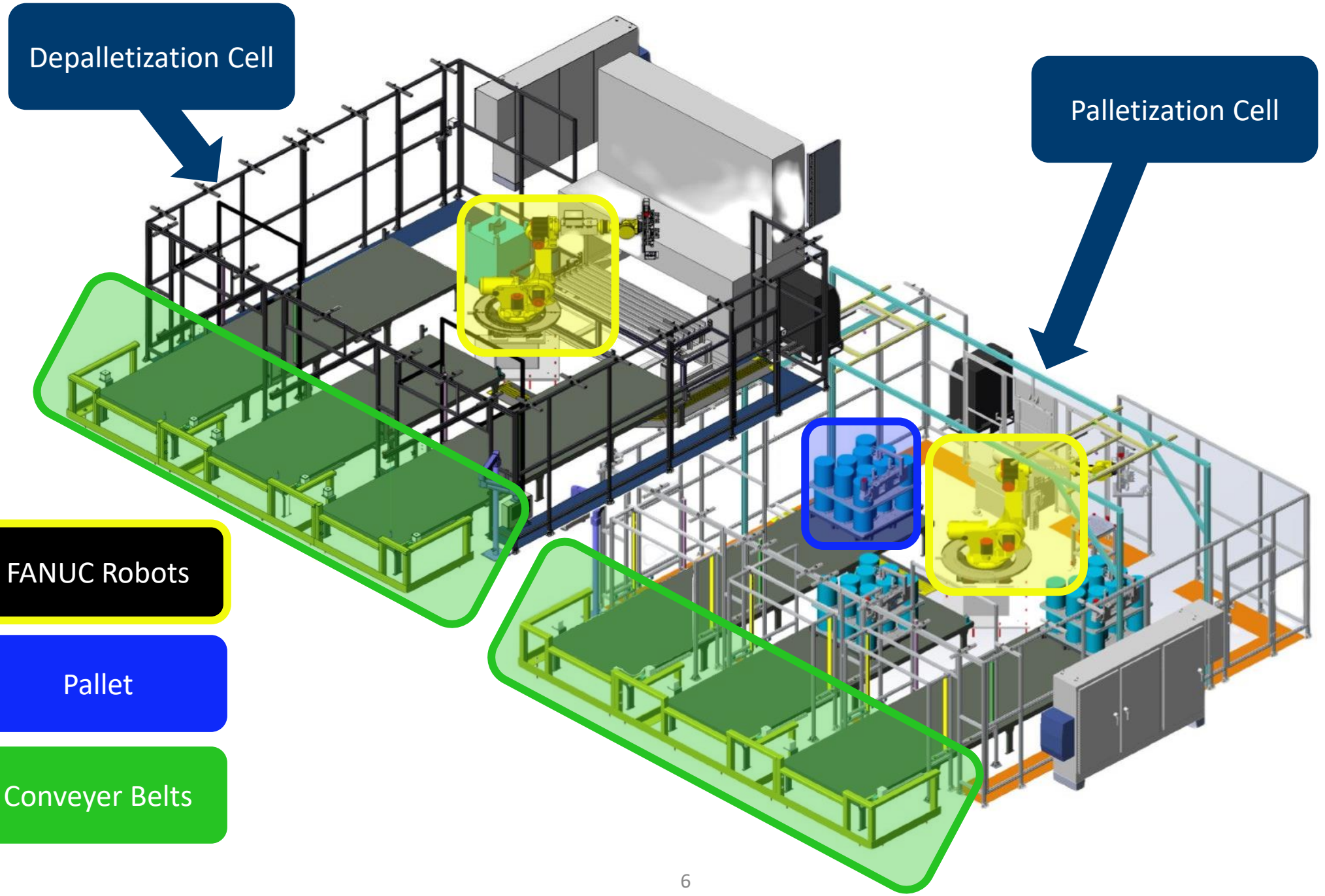
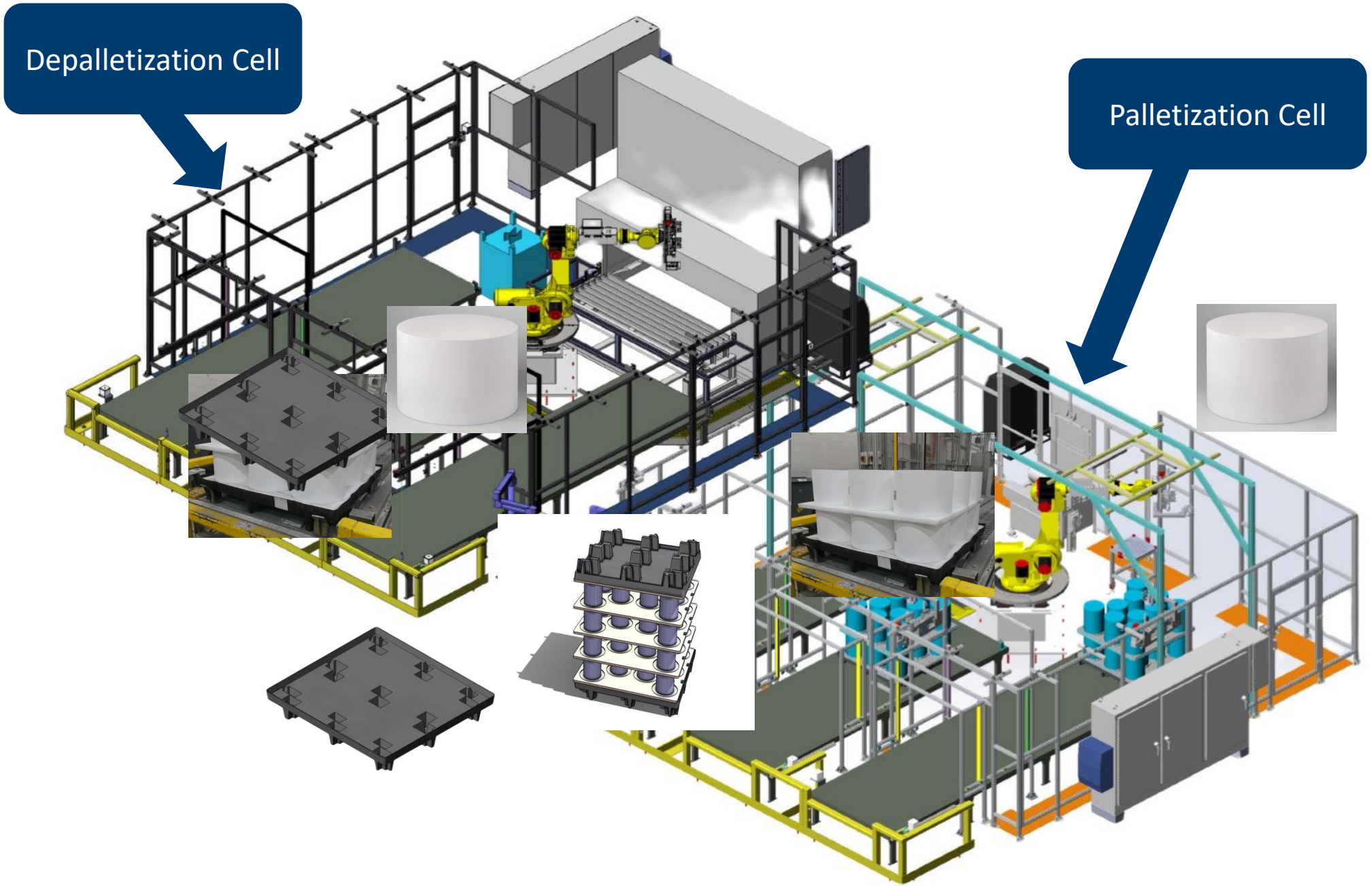


Michael Rodriguez



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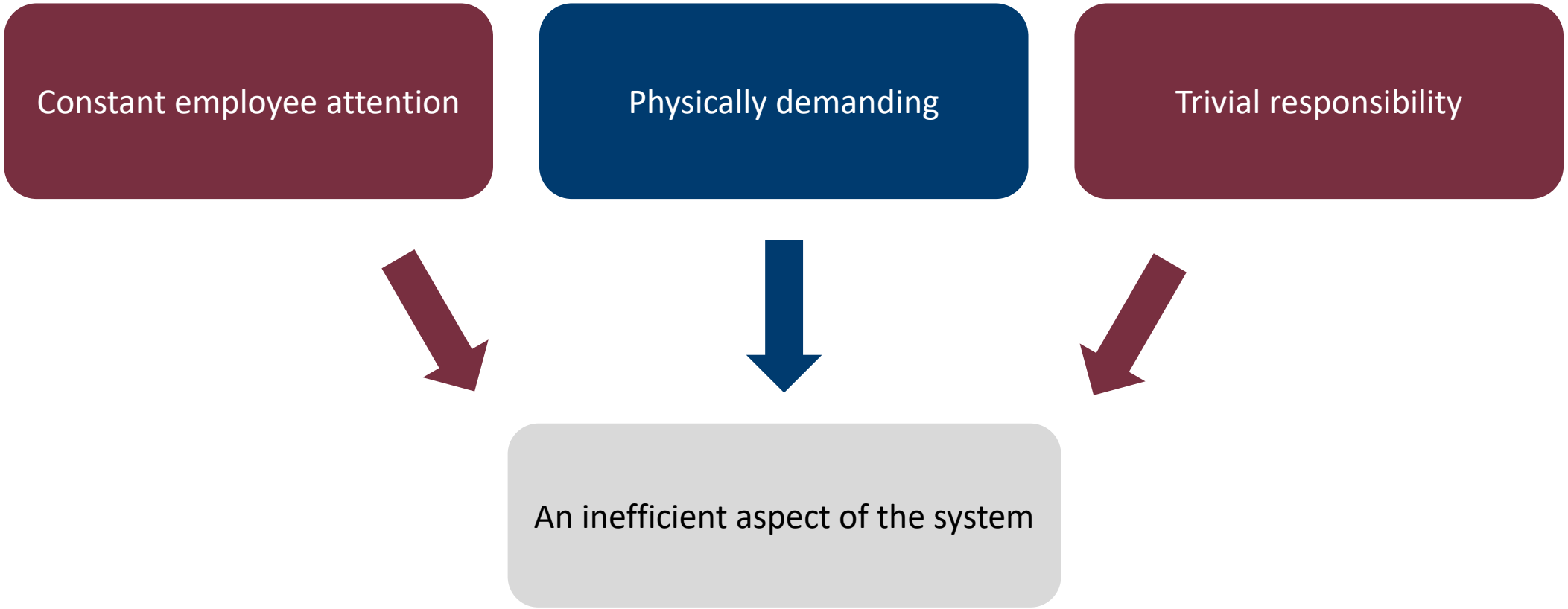
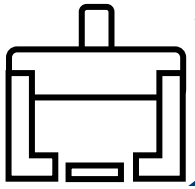
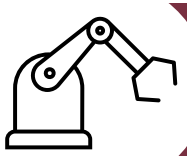
Trouble Spots



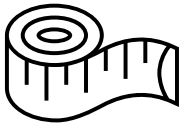
Key Goals



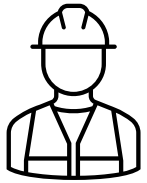
Placement and removal of pallet toppers.



The device is automated.



The device will be able to fit in or around current assembly cells.



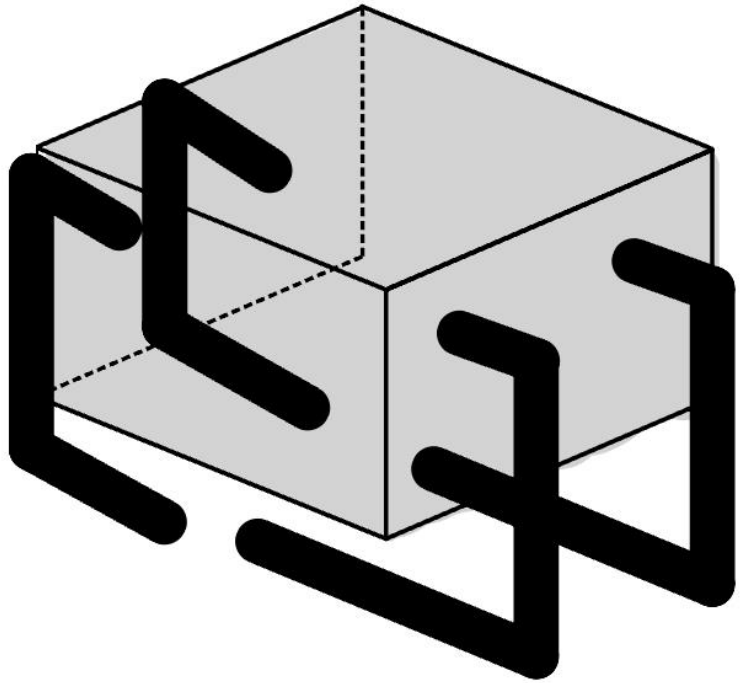
Ensure that the device is safe.

Targets and Metrics

Carries Load	• System is able to lift and move a load of 30 pounds or more
Cycle Time	• System will take less than or equal to 120 seconds to complete one cycle
Robustness of Positional Error	• System will operate with the stack being offset by 6 inches or less
Grip Reliability	• Successfully lift the pallet topper 95% of the time

Concept Selection

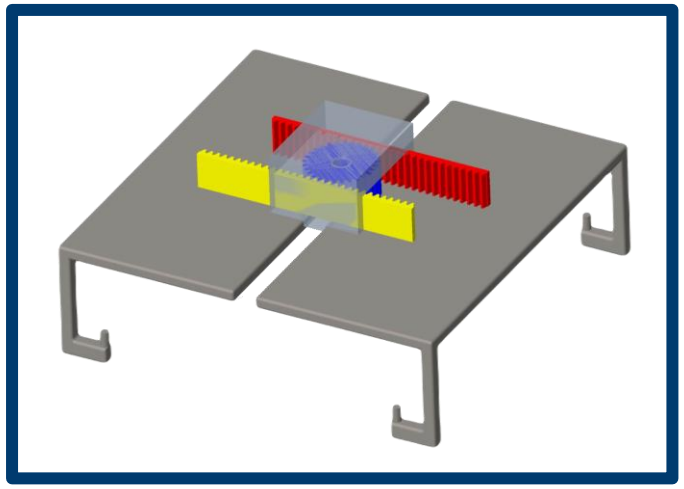
- Created 100 conceptual ideas
- Spider Claw Rack and Pinion
- Iterations lead to final tabletop design and CAD design for Corning



Preliminary Design

GUDEL 2-Axis Gantry

Tooling Concept

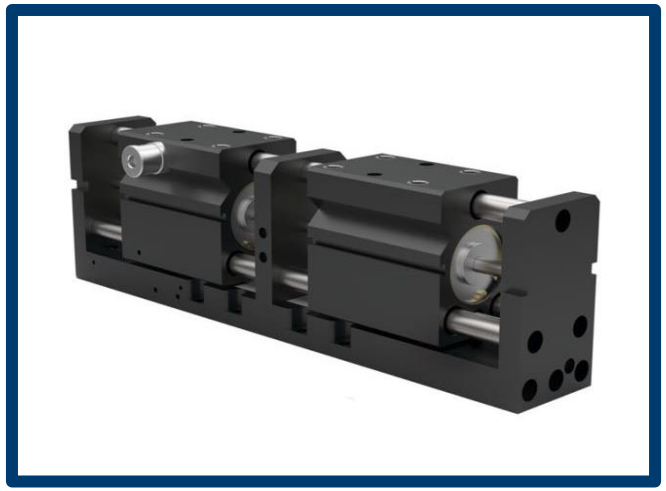


Rotary Clamps

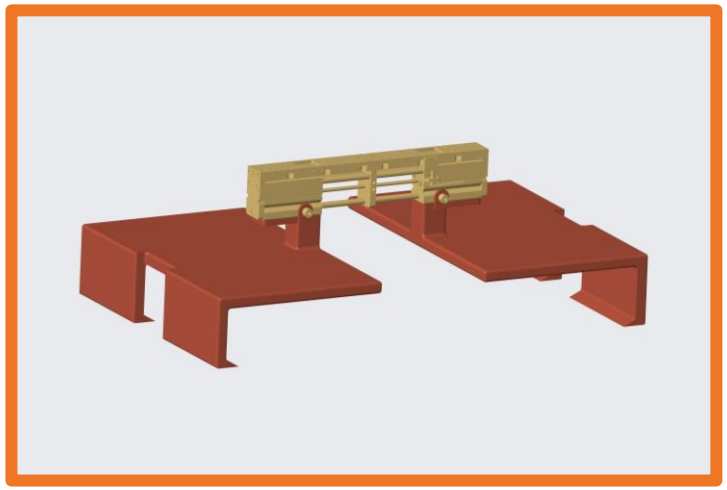
Current Full-Scale Design

GUDEL 2-Axis Gantry

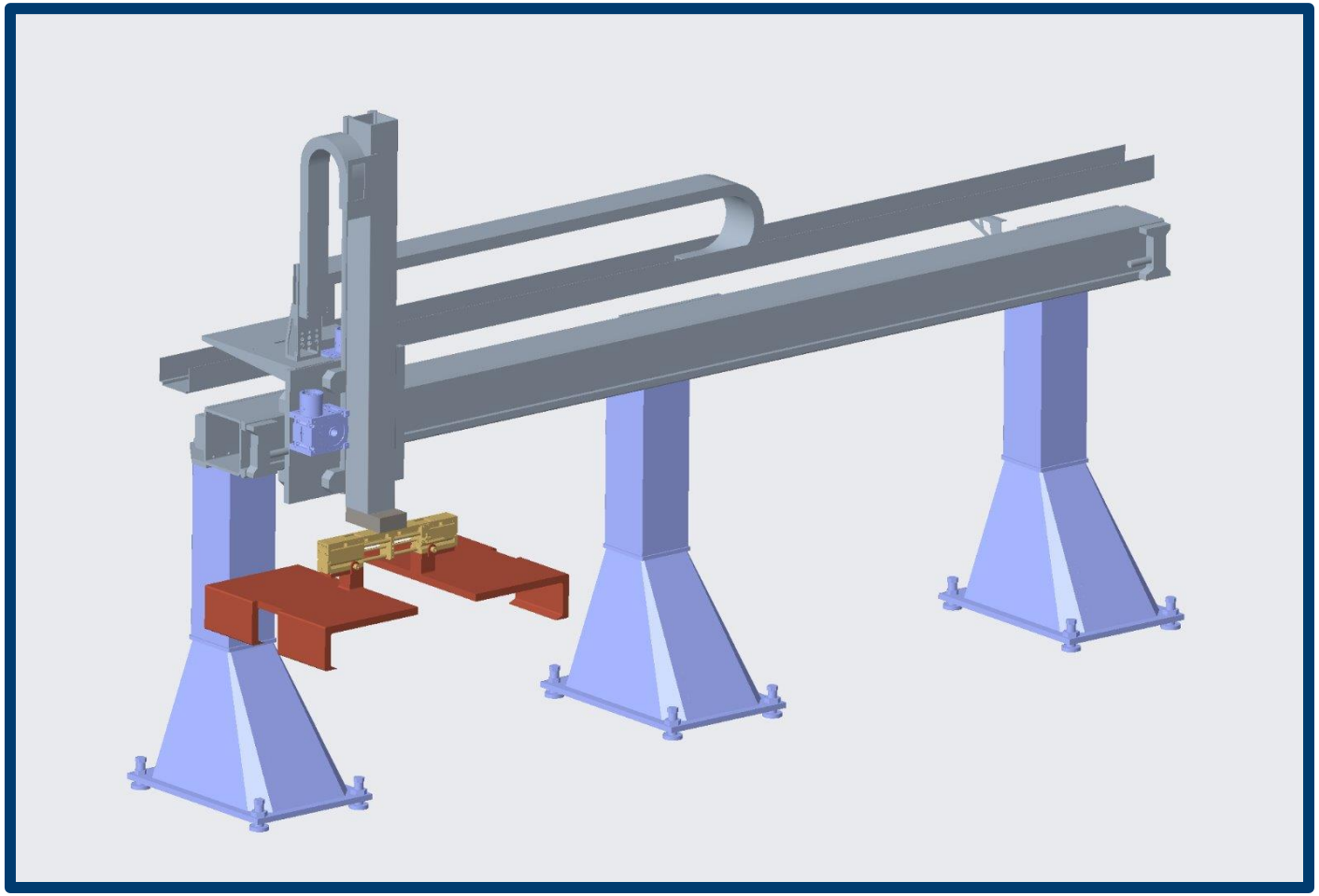
DESTACO - Parallel Gripper



Custom Tooling Extenders



Current Full-Scale Design

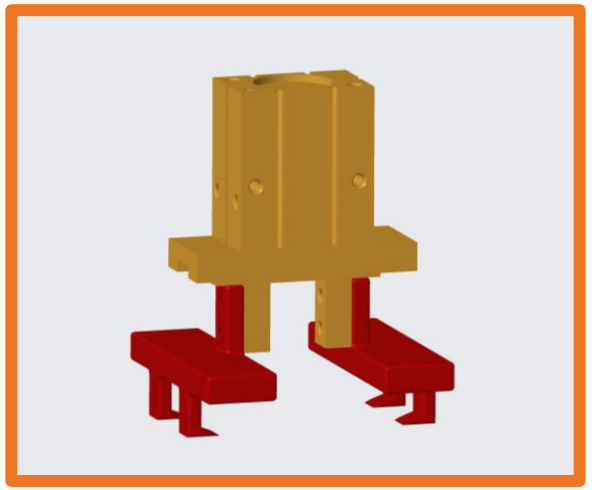


Scaled Model Design

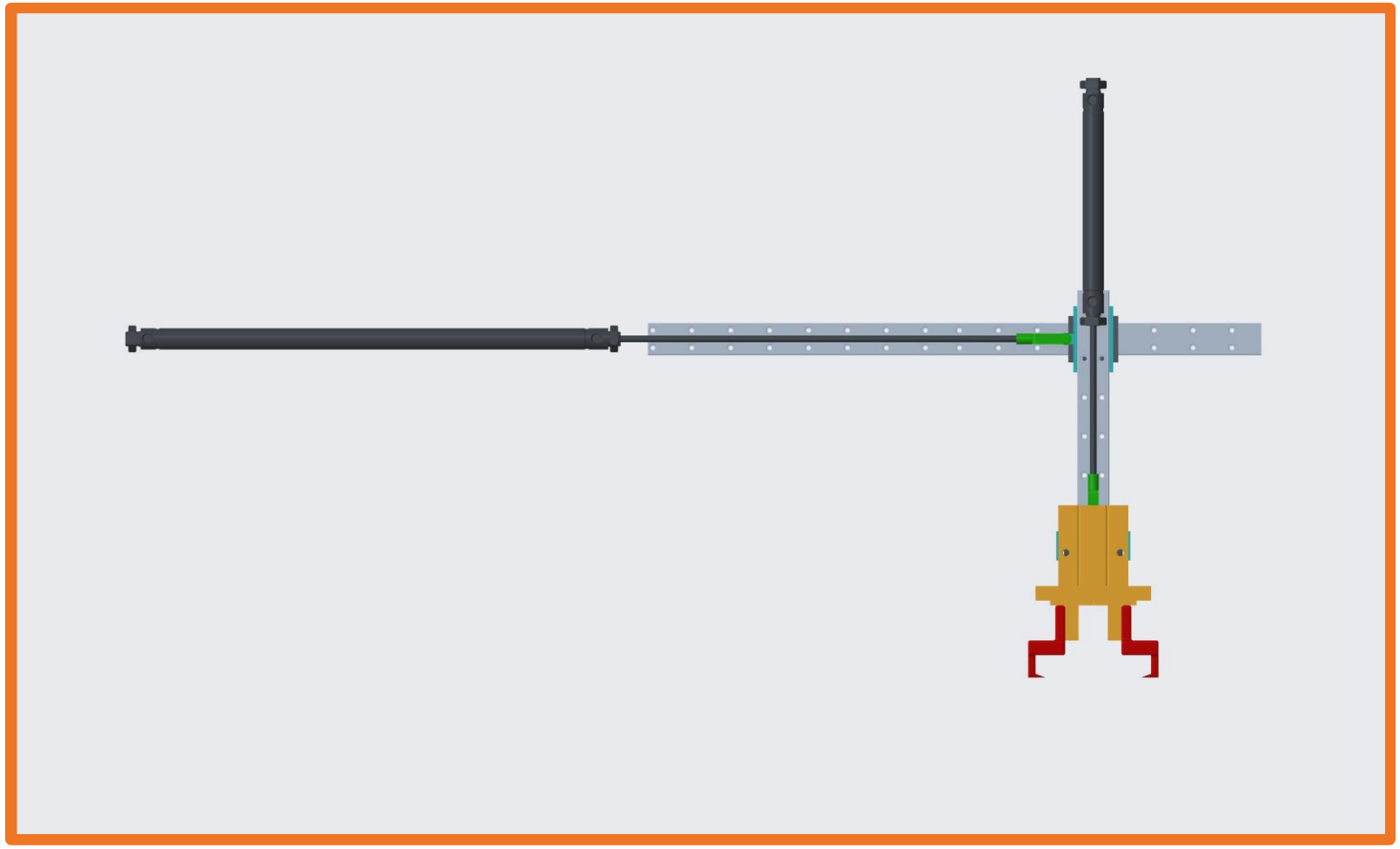
Pneumatic Mock Gantry System

Pneumatic Parallel Gripper

Custom Tooling Extenders

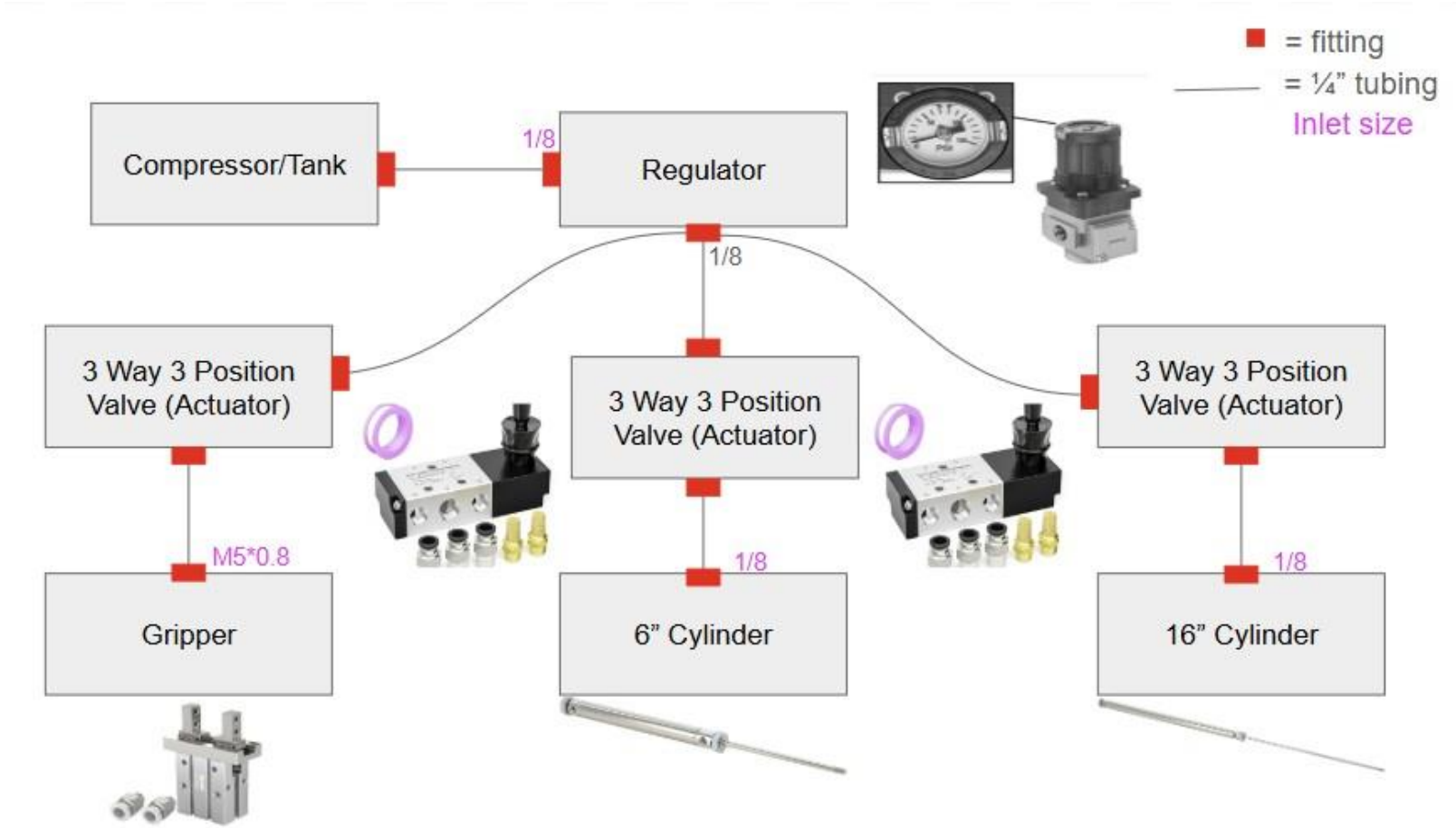


Scaled Model Design



Craig Yox

Pneumatic Diagram



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Corning Expectations

Cycle Time Estimation

- Use GUDEL and DESTACO specs

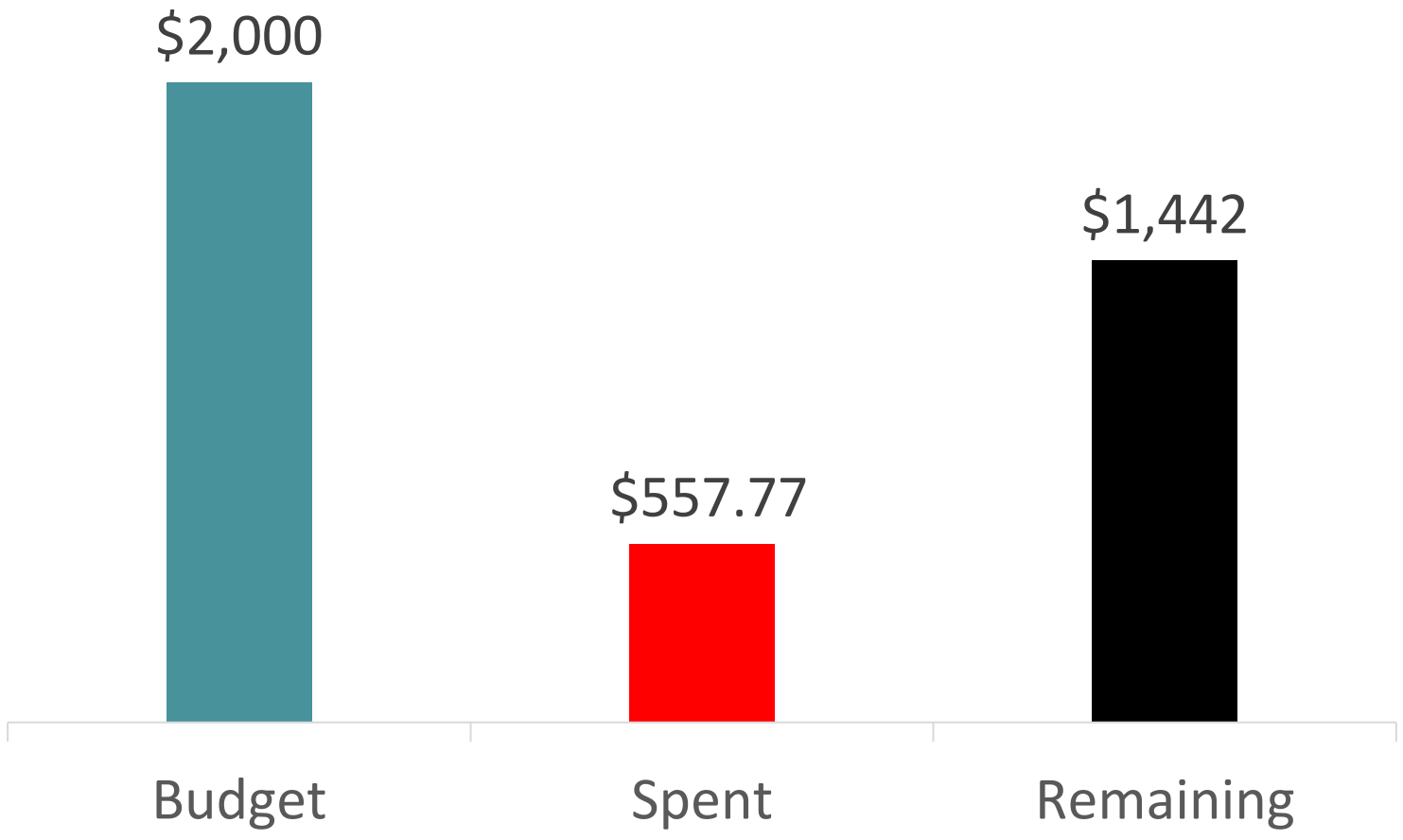
Proof of Concept (CAD Model)

- Display full scale CAD design

Proof of Concept (Scaled Model)

- Simulate motion of the system in real world conditions at a scaled size

Current Budget



Future Work