

Team 9: Phoenix Automated Loader

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Problem Statement

The Phoenix Packaging Machine at Aspen Surgical relies on manual handling to load and unload pouched suture devices. Variability in the manual process can lead to inconsistent part handling, resulting in damaged products, reduced production efficiency, and increased operator workload.

Objective

Design, build, and validate an automated loading and unloading system for the Phoenix Packaging Machine that integrates with existing equipment while reducing manual handling and improving manufacturing efficiency.

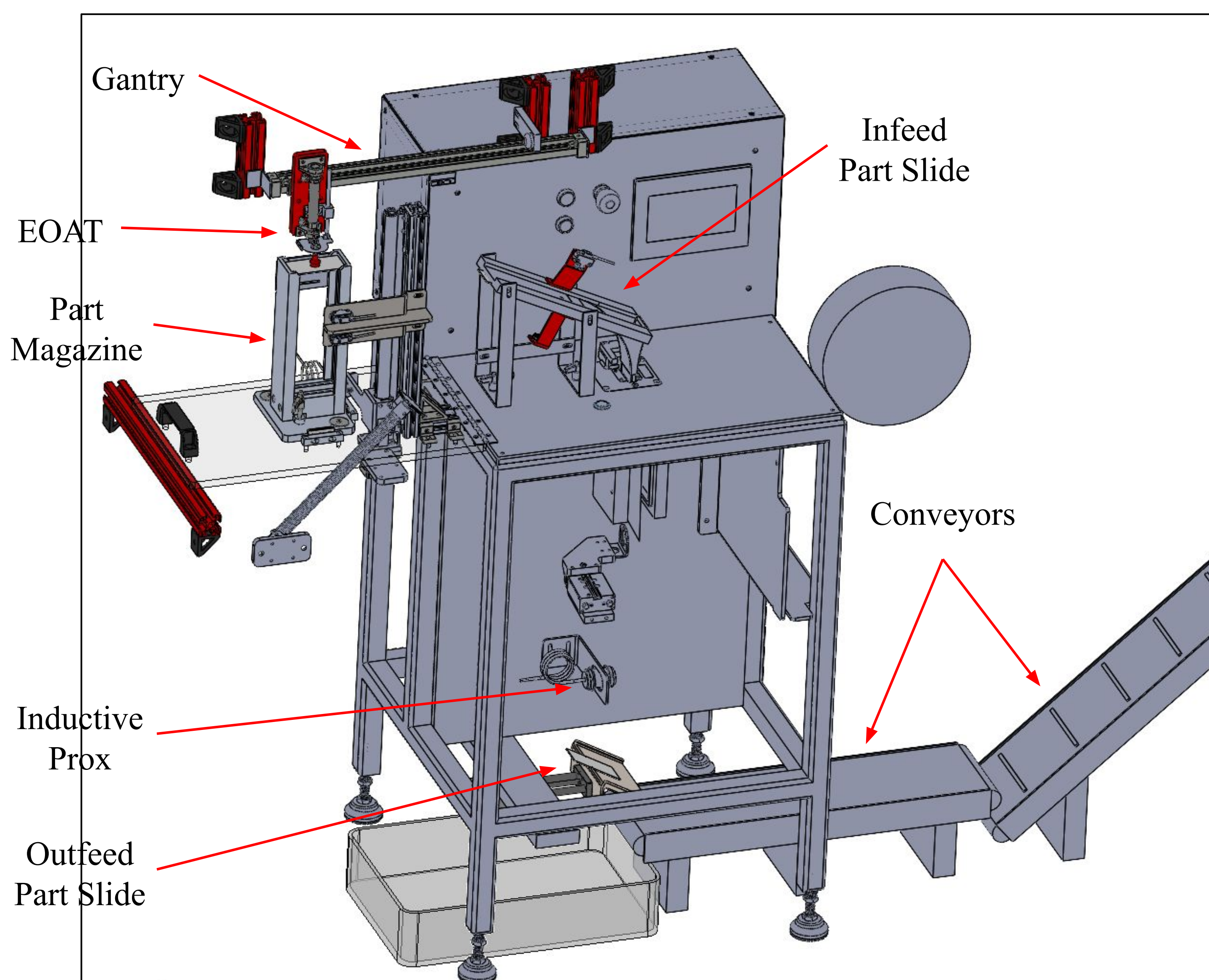


Figure 1. Overall System Layout without Guarding

Design Approach

- Designed to integrate with the existing Phoenix Packaging Machine while minimizing modifications.
- Utilized Aspen Surgical inventory including conveyors, sensors, pneumatics, aluminum extrusion, and 3D-printed components to reduce cost and lead time.

Key Features

- Vacuum EOAT
- Passive Gravity-Fed Infeed
- Automated Part Verification
- Pneumatic Reject Sorting
- Cleated Z-Frame Conveyor
- Interlocked Safety Guarding
- Utilized Existing Aspen Inventory

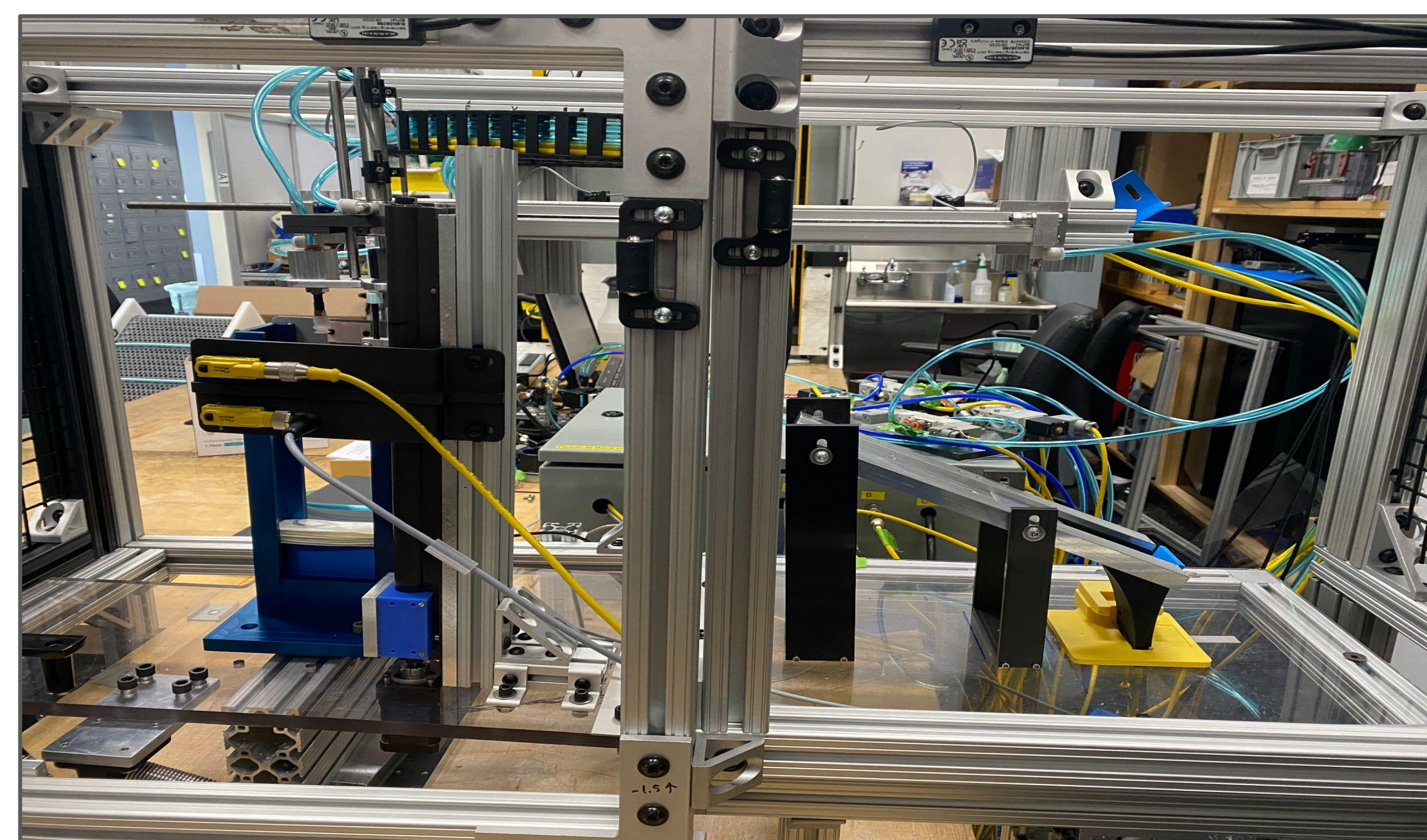


Figure 2. Completed Phoenix Autoloader Assembly

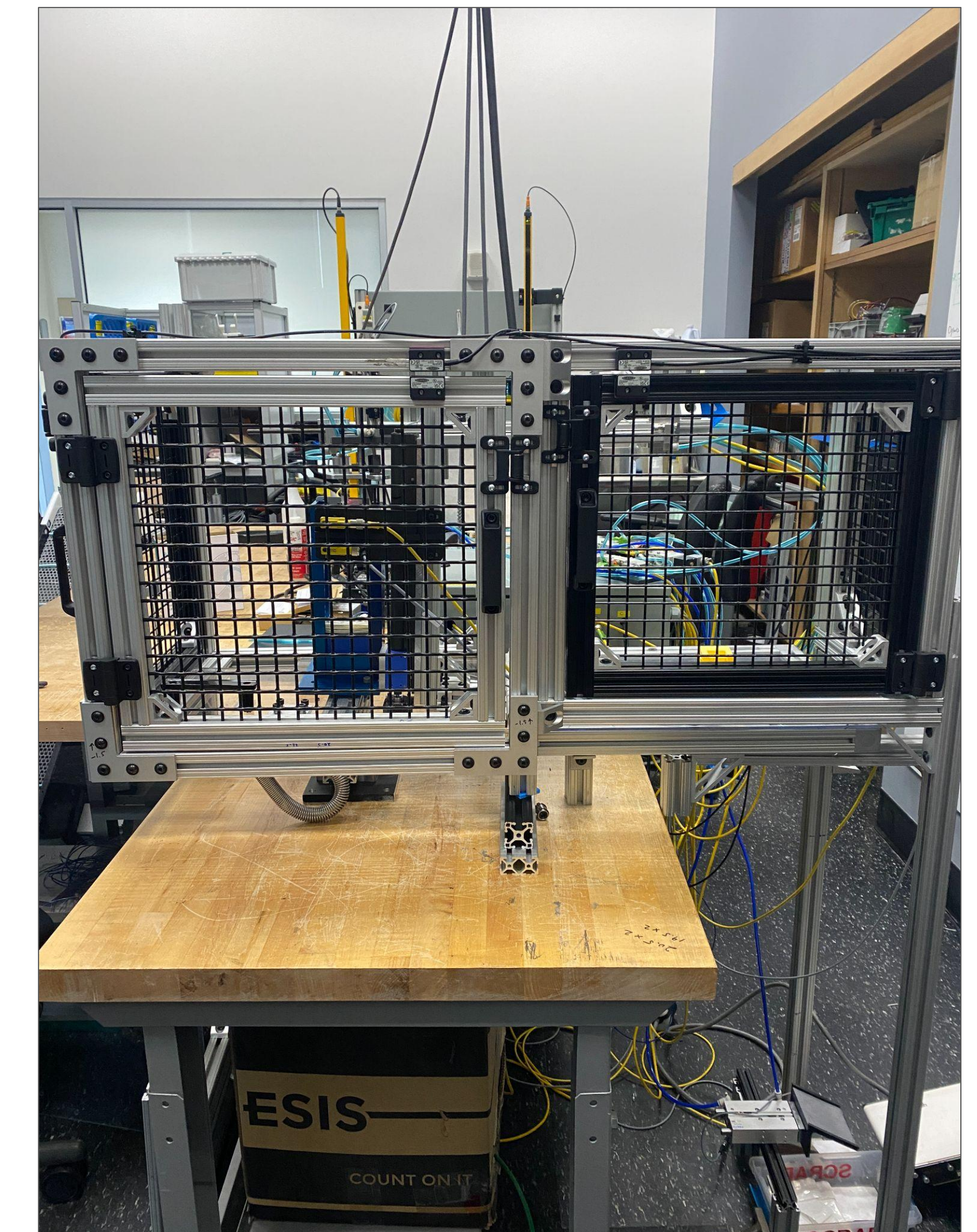


Figure 3. Completed Phoenix Autoloader Assembly

Key Project Outcomes

- ✓ Successfully automated loading of pouched suture devices into the Phoenix Packaging Machine.
- ✓ Automatically verified product presence and sorted conforming and nonconforming packages.
- ✓ Automated unloading and conveyance of completed products to an ergonomic operator height.
- ✓ Reduced manual handling through a fully automated part transfer process.
- ✓ Leveraged existing Aspen Surgical inventory, including pneumatic hardware, sensors, conveyors, aluminum extrusion, and 3D-printed components, reducing project cost and lead time.

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