



Tote De-Stacker



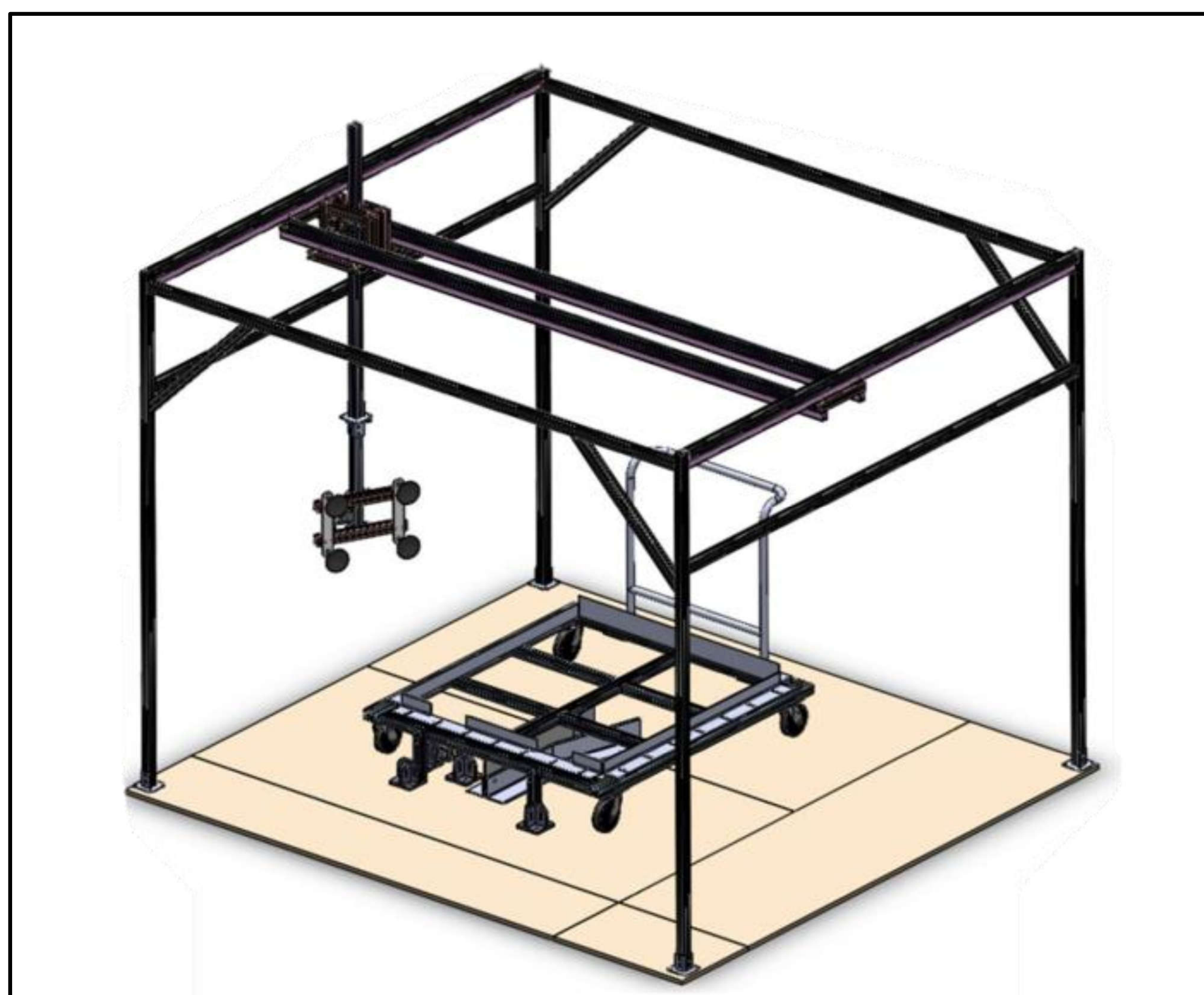
HermanMiller

Team Members: Nicholas Taylor, Trenton Peters, Andy Bischoff, Alex Kuzner, Sam Gipe

Project Summary

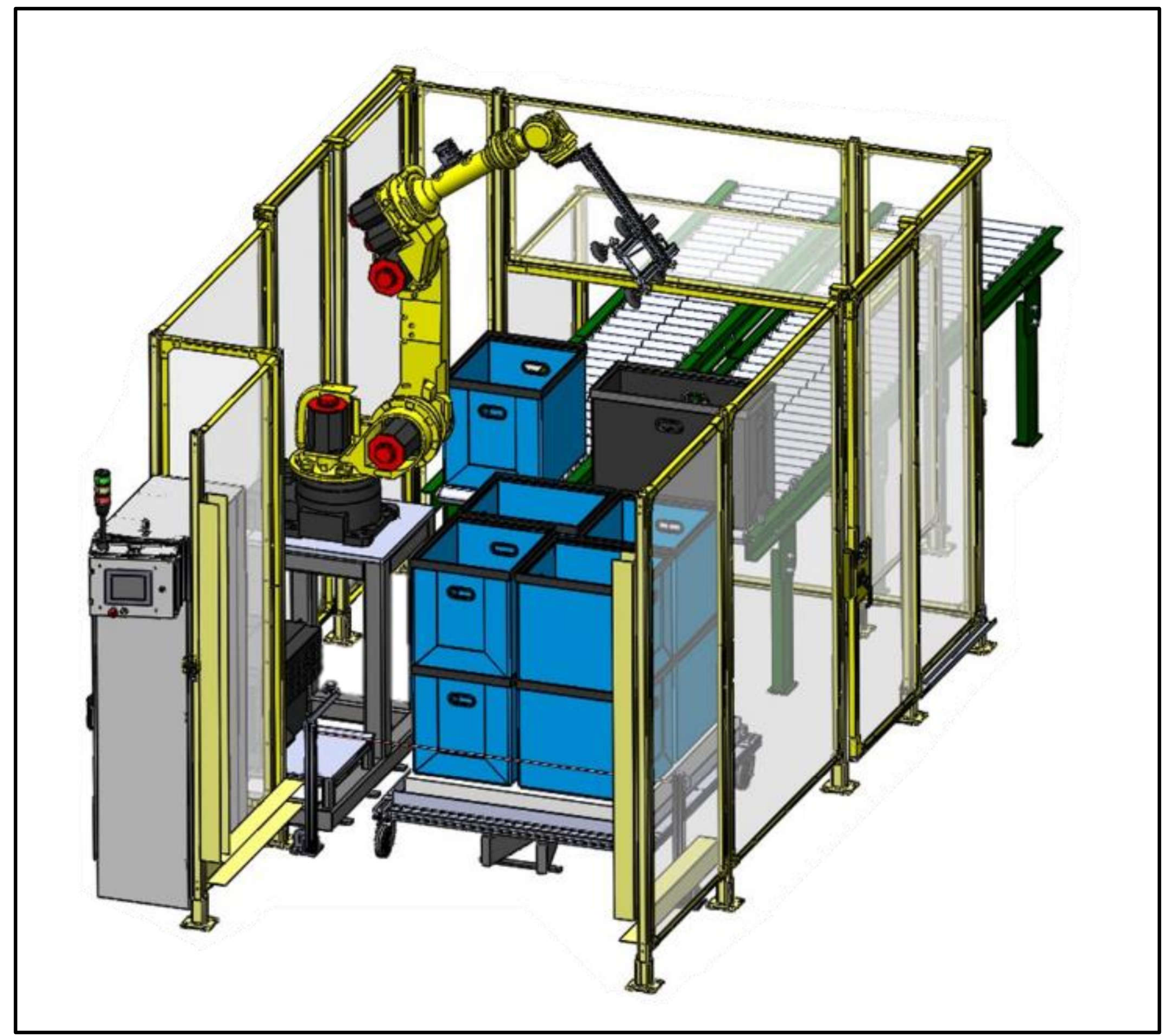
The purpose of the design is to alleviate ergonomic and timing concerns by replacing the actions currently conducted by a material handler. Currently, a pallet of blue totes and a pallet of black totes are unloaded two at a time onto a conveyor.

- A FANUC robot was chosen to replace the material handler actions.
 - Efficient
 - Adaptable
 - Compact
 - Reliable
- To emulate the final design robot movements for the prototype, a gantry was constructed with a similar EOAT to prove out important methods. This can be seen below:



- Using the prototype, the EOAT, tote detection method, repeatability of tote gripping, and location of skid to cell were proven out.

- The final design layout utilizing the FANUC R1000iA-80F robot can be seen below:



- The final design uses a cart which is then locked using a pin locking device. The cart handle must be removed before starting the cycle. Laser sensors are used to ensure the handle has been removed, conveyors have space for a new tote, and to detect the totes edge on the EOAT.
- The final design employs a color sensor to determine which tote is being unloaded. The black and blue totes are sent down the appropriate conveyors and sorted in the proper order.
- The final design main objectives which have been accomplished:
 - Eliminate operator lifting
 - Minimize floor space
 - Minimize cost
 - Improve current cycle time
 - Prove out key features