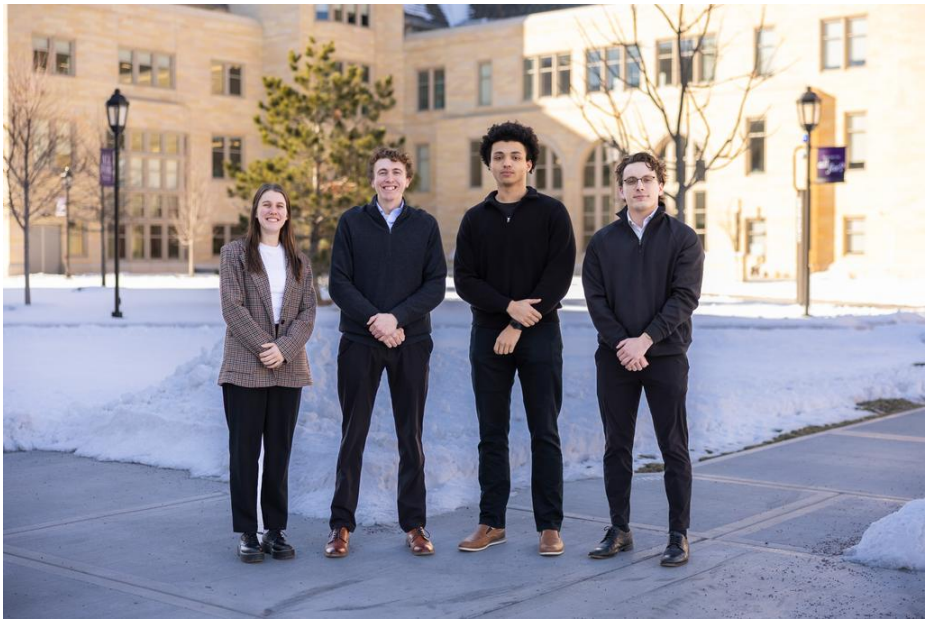
Mass Properties Measurement Machine



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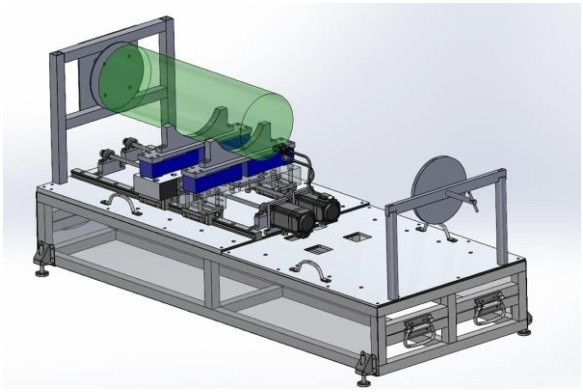
PROJECT BACKGROUND & DESIGN GOAL:

Northrop Grumman needs a machine that can measure mass and center of gravity of test assets on a smaller and less costly scale compared to the current models used on large production lines. **Our solution will help them measure their large mechanical test assets, to provide highly accurate data on the respective mechanical and mass properties for the research and development that they conduct.**

DESIGN SUMMARY:

Our design utilizes four load cells that are used to measure the weight of the test assets. Two motors move fixture carts along linear guide rails to hold the test assets at known locations. These locations and the weight measured by the load cells are used to measure the center of gravity of the test assets. The clamp fixture ensures the test assets are held in place, and the leveling feet ensure accurate data is being measured.



Picture of system in CAD

DESIGN CONSTRAINTS:

- Hold test components up to 250lb
- Hold test components up to 6.75” in diameter and 45” in length
- Report total mass in English and SI units
- Measure and report results to the tenth of an inch and tenth of a pound (0.X)

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