

# Creating a Dynamic Lift System for Assisted Mobility

Author

Dustin Branges

Mentors:

Dr. Sarah Oman

Dr. Kyle Winfree



# Why is This Important?

- During 6 month expeditions aboard the International Space Station, astronauts lost on average:
  - 13% muscle volume
  - 32% peak power
  - 9% bone mass
- Full recovery can take as long as 3-4 years



# Other Important Applications

- Stroke survivors
- Patients with traumatic brain injuries
- Lower extremity amputees
- Individuals with limited self-mobility



# Our Proposed System

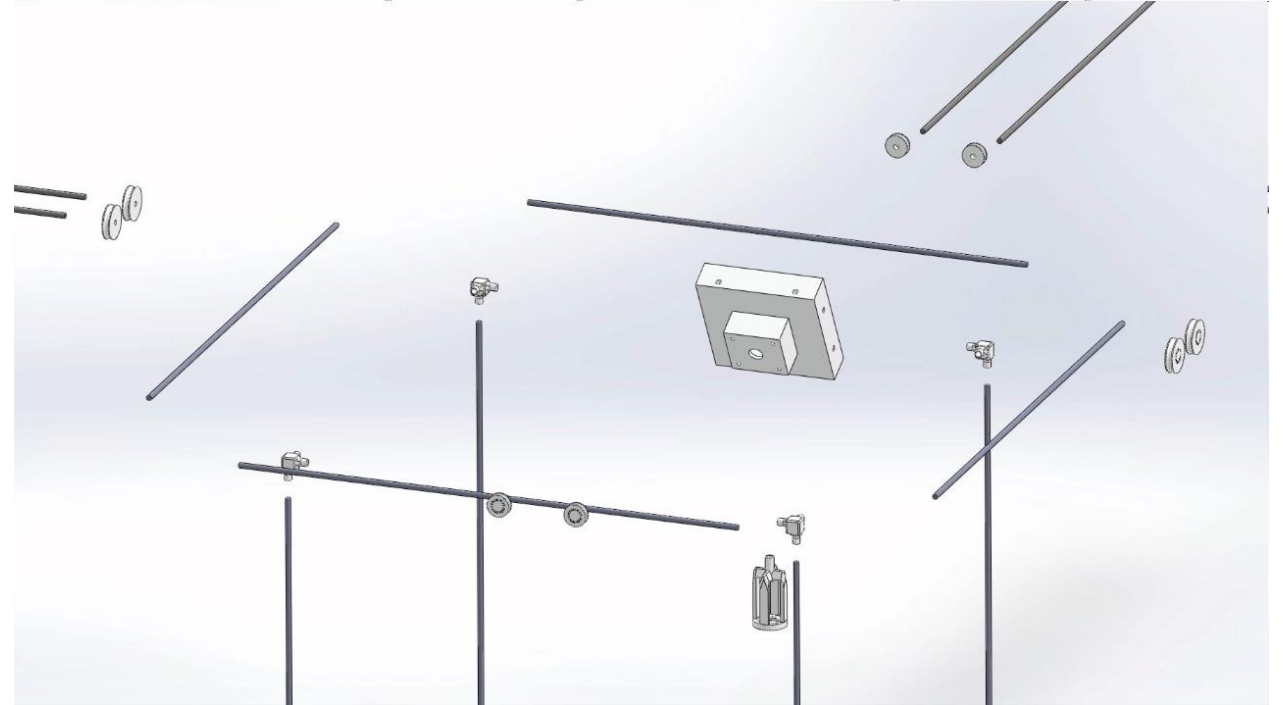
Our goal is to address and overcome two of the shortcomings present in most other similar systems:

1. Free movement anywhere within the frame of the system
2. Dynamic weight support



# Free Movement

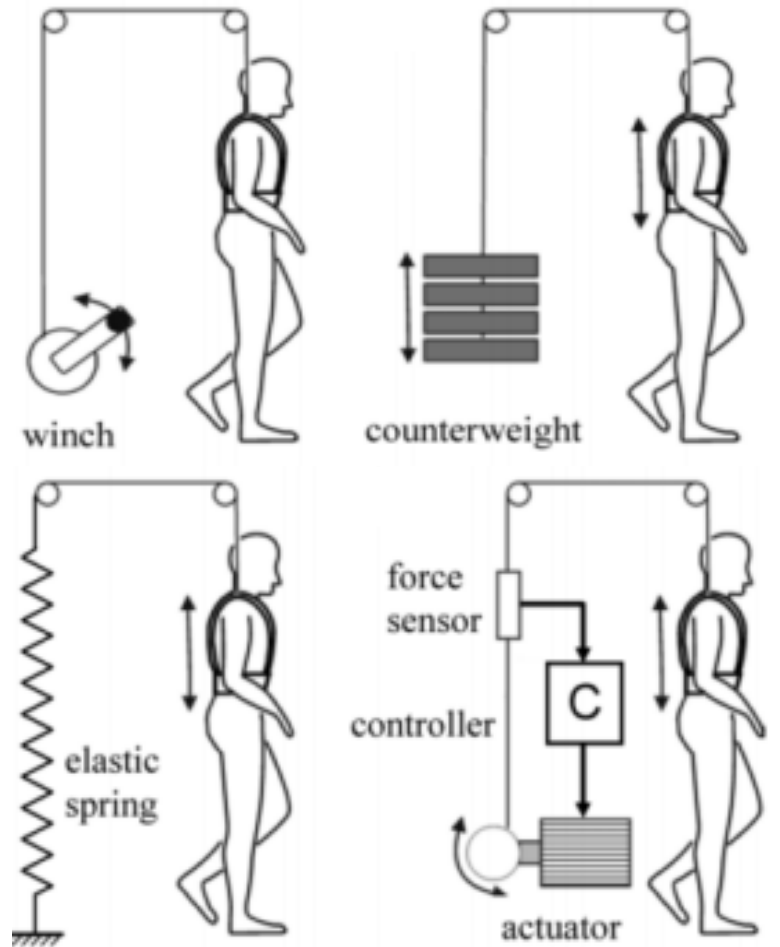
Achieved by using a head unit that tracks the individual's movement and is able to follow in any direction within the framed system



# Dynamic Weight Support

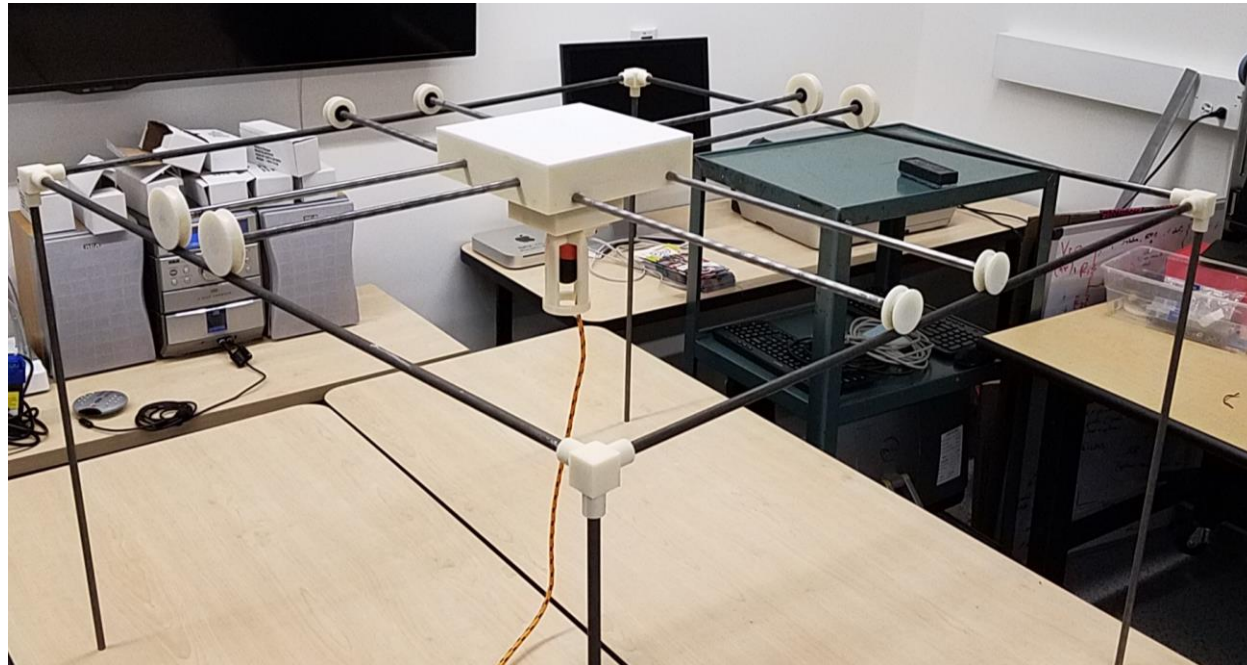
## Future Goals:

- Support a percentage of the individual's weight
- Potential fall arrest
- Allow for vertical movement



# Potential Impacts of Our Project

- Increased recovery speed
- Independence of movement
- Integration into the home and workplace



# Acknowledgements

- Dr. Sarah Oman & Dr. Kyle Winfree
- Northern Arizona Space Grant Program
- Dr. Nadine Barlow and Sr. Program Coordinator Kathleen Stigmon
- The Northern Arizona University Engineering Fabrication Lab and RAPIDLab



# Questions?

