NORTHERN ARIZONA UNIVERSITY

In Home Anti-Gravity Harness

Team 10
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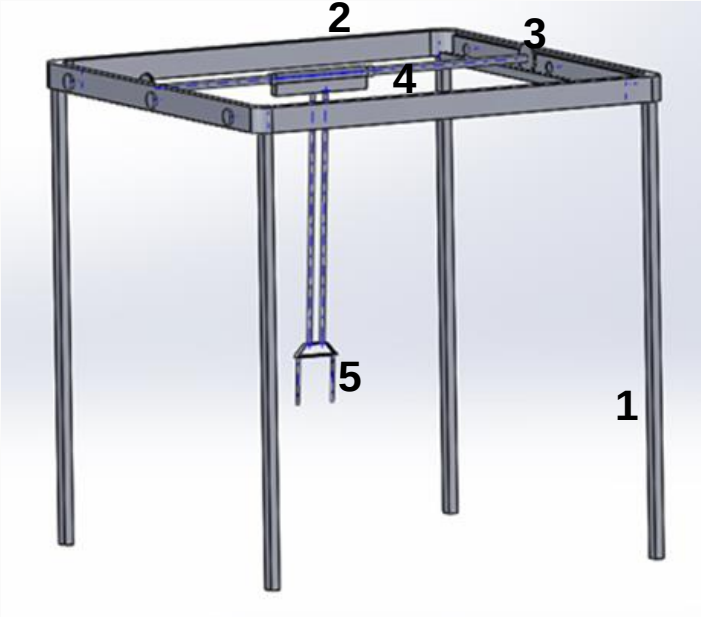
Project Description

- The goal of this project is to design a DIY manual for an anti-gravity balancing harness system
- The client is Dr. Kyle Winfree from the Wearable Informatics Lab at NAU
- The product is directed towards children (under the age of 5) who need assistance moving about the house
- The system must be simple enough to build with limited resources and engineering knowledge

Project Description

- The team originally expected to build a mobile device but encountered safety issues
- The client has expressed a desire in making the device able to assist the child with moving from sit to stand
- Originally the team's biggest problem was ease of assembly due to manufacturing limitations
  - Now there are problems with storage capabilities

Updates – New Design



1. EZUP base
2. Support bar
3. Track system for X direction movement
4. Slider Bar for Y direction movement
5. Connectors between support bar slider bar

Updates - Original Design

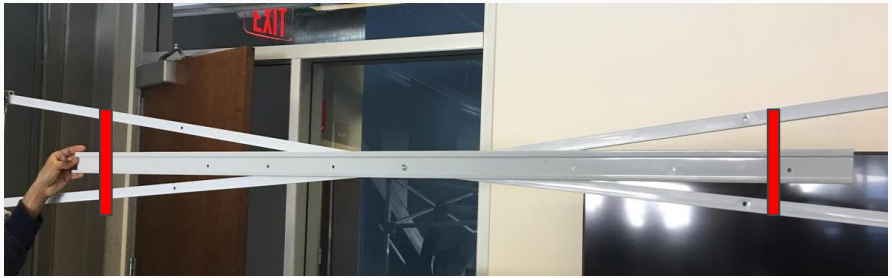
Changes
➢ Support bar design
➢ Wheels roll on installed track
➢ Use slider bar to give user more mobility
➢ Attached the guide-rail to the side of EZ-up frame

Updates – New Design

Purchases

Part	Function
Guide Rails	Allows cross-bar to slide along the frame
Main Support Bar	Holds weight distributor
Wheels	Roll along track
EZ-up	Frame

First Guide Rail Attempt



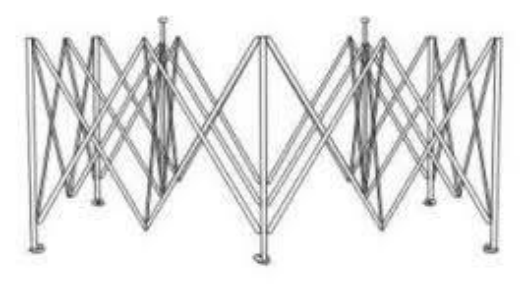
- Form double triangle shape to attach track along side of frame
- Attach vertical supports to the frame
- Collapsibility problems

Manufacturing

- Have guidance rails done before Hardware Review 1 (2/13)
- Finish harness attachment system by middle of February
- Know which materials are needed for final design by the beginning of March
- Begin DOE testing by 3/20 with final design
  - Structural Integrity
  - Ease of Movement

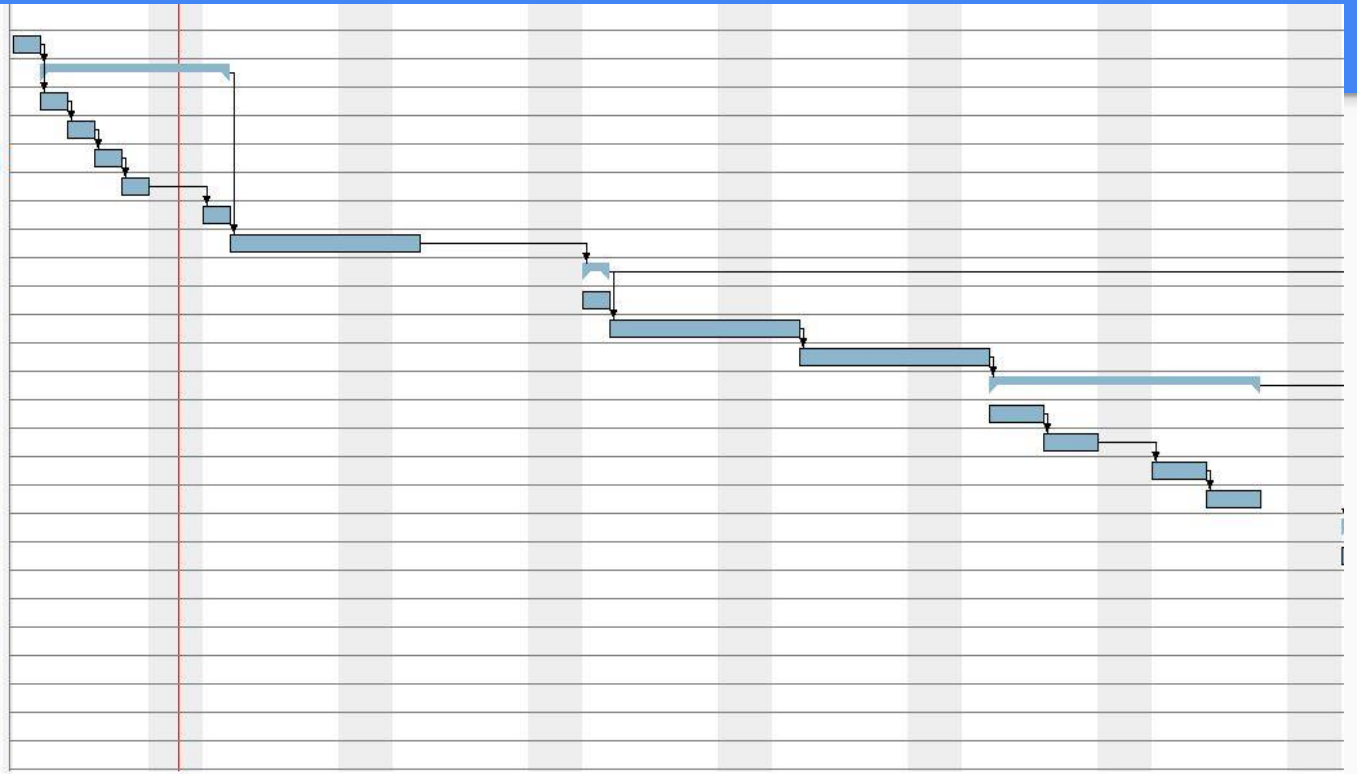
Manufacturing

- Team Skills
  - Harness and attachments
  - Loading
  - Design Frame
  - Roller System
  - Budget



Schedule

7.0 First ME486 Team Meeting	1/16/17	1/16/17
8.0 First ME486 Staff Meeting	1/23/17	1/23/17
9.0 Progress Presentation	1/24/17	1/30/17
9.1 Project Description	1/24/17	1/24/17
9.2 Updates	1/25/17	1/25/17
9.3 Manufacturing	1/26/17	1/26/17
9.4 Schedule and Budget	1/27/17	1/27/17
9.5 Future Works	1/30/17	1/30/17
10.0 Second ME486 Team Meeting	1/31/17	2/6/17
11.0 Hardware Review 1	2/13/17	2/13/17
11.1 Construction of Roller Co...	2/13/17	2/13/17
12.0 Second ME486 Staff Meeting	2/14/17	2/20/17
13.0 Thrid ME486 Team Meeting	2/21/17	2/27/17
14.0 Midpoint Review Presentation	2/28/17	3/9/17
14.1 Project Description	2/28/17	3/1/17
14.2 Updates	3/2/17	3/3/17
14.3 Construction	3/6/17	3/7/17
14.4 Final Construction Plans	3/8/17	3/9/17
15.0 Hardware Review 2	3/13/17	3/20/17
15.1 Close to Final Assembley	3/13/17	3/20/17
16.0 Fourth ME486 Team Meeting	3/21/17	3/27/17
17.0 Third ME486 Staff Meeting	3/28/17	4/3/17
18.0 Final Product Testing Proof	4/4/17	4/17/17
18.1 Test every subsystem	4/4/17	4/17/17
19.0 UGRADS Presentation	4/18/17	4/24/17
19.1 Poster	4/18/17	4/19/17
19.2 Final Assembley	4/18/17	4/24/17



Budget

	Cost
Harness 	$16
Spreader Bar 	$75
Ez-Up 	$219

	Cost
Aluminum Track 	$0.01
Guide Rail(2) 	$45
Garage Rollers 	$5
SuperSlide Closet Rod 	$12

Budget

Total Amount Available: $1500

Actual Expenses to Date: $371.34

Resulting Balance: $1,128.66

Future Plans

- Continue manufacturing guide rail system to determine best design

- Add new sections to midpoint report
- Update CAD package and Operation Manual as design evolves
- Formulate detailed testing plan

Questions or Comments