ANTI-GRAVITY HARNESS TEAM

TEAM 10

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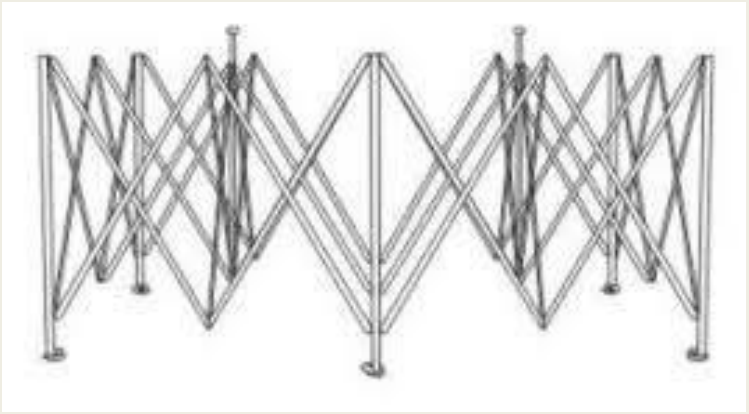
Project Background

- Almost 1 million children in the U.S. suffer from degenerative diseases
- Children with limited mobility are often unable to socialize
- Parents of these children are often limited by resources

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 that parents with limited resources and engineering knowledge can construct it

Design Description



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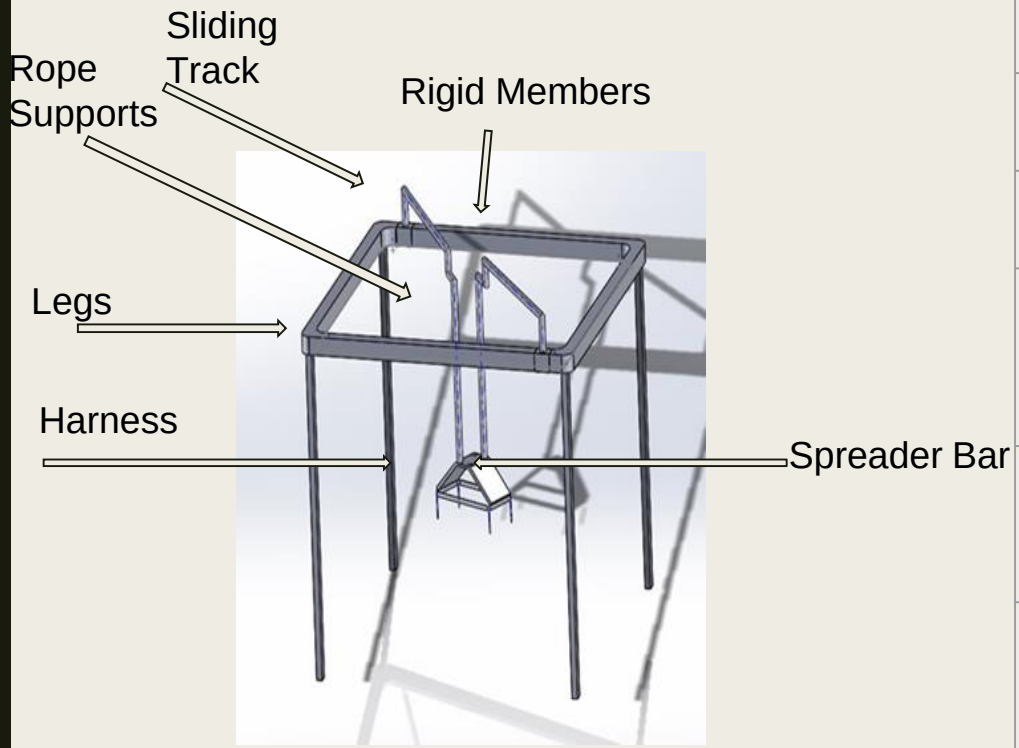


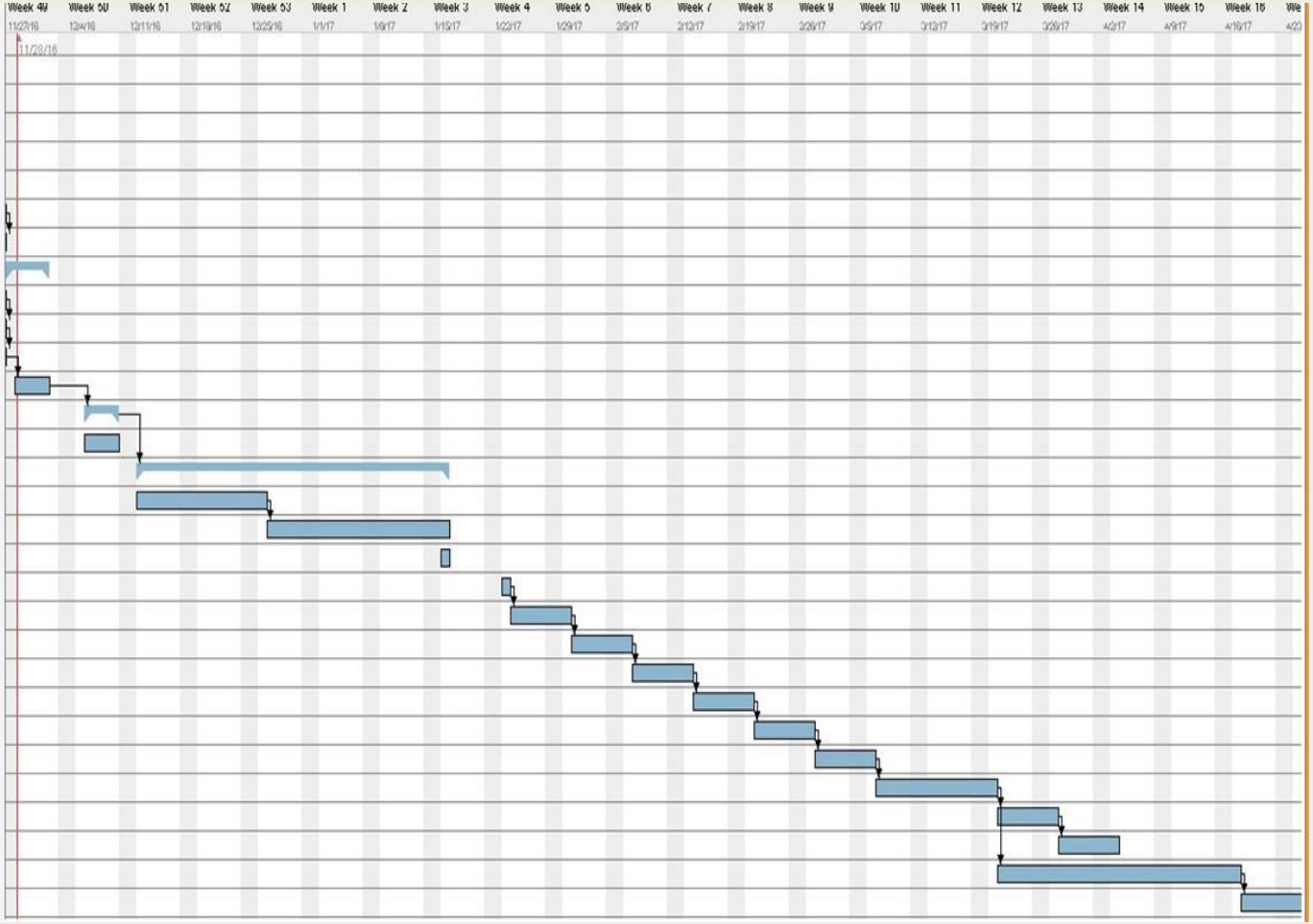
Functions/Details
• Aluminum alloy frame
• Collapsable/foldable design
• External rolling track system
• Spreader Bar used to evenly disperse weight to the frame
• Harness type: Three-point harness
• Rotational movement enabled in harness system

Design Requirements

- Customer Requirements
  - *Safety*
  - *Ease of Assembly*
  - *Adjustability*
  - *Durability*
  - *Size*
  - *Workspace Size*
  - *Comfort*
  - *Cost*
  - *Aesthetics*

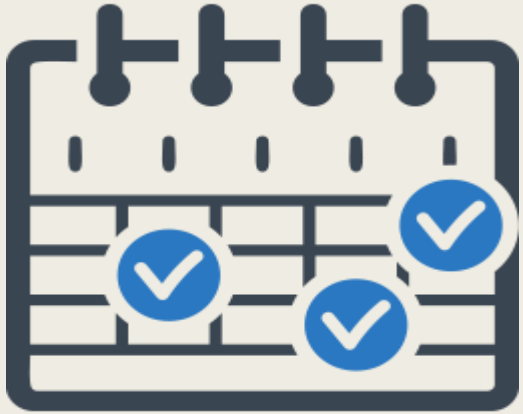
Schedule

Name	Begin date	End date
2.4 Schedule and Budget	10/24/16	10/24/16
Third Team Meeting	11/9/16	11/9/16
Third Staff Meeting	11/14/16	11/14/16
3.0 Third Presentation: Final Prese...	11/15/16	11/22/16
3.1 Project Description Review	11/15/16	11/15/16
3.2 Design Description	11/16/16	11/17/16
3.3 Design Requirements	11/18/16	11/21/16
3.4 Schedule and Budget	11/22/16	11/22/16
4.0 Final Proposal	11/23/16	12/1/16
4.1 Project Description and Ne...	11/23/16	11/23/16
4.2 Design Selection	11/24/16	11/24/16
4.3 Design Requirements	11/25/16	11/25/16
4.4 Proposed Design	11/28/16	12/1/16
5.0 Fourth Staff Meeting	12/6/16	12/9/16
5.1 Industrial Prototype	12/6/16	12/9/16
Researching and Purchasing	12/12/16	1/16/17
Tools	12/12/16	12/26/16
Parts	12/27/16	1/16/17
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
10.0 Second ME486 Team Meeting	1/31/17	2/6/17
11.0 Hardware Review 1	2/7/17	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	3/6/17
15.0 Hardware Review 2	3/7/17	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	3/21/17	4/17/17
19.0 UGRADS Presentation	4/18/17	4/24/17



Schedule

- The team is currently on schedule.
- During the design selection process the final design was changed
- For the industrial prototype the plan is to start early on construction
- All parts and tools will be searched for and purchased over the winter break



Budget

Harness Subsystem Components	Cost
Nylon Rope	$16 [1]
Harness 	$14 [2]
Spreader Bar 	$20 [3]

Frame Subsystem Components	Cost
Slider 	$87 [4]
Ez-up 	$219 [5]

Budget

Anticipated Tools Budget

Tool	Cost
Hammer	$9
Wrench	$8
Power Drill	$25
Screwdriver	$26
Total	$68

Total Anticipated Cost: $424
Total Amount Available: $1500

Actual Expenses to Date: $0
Resulting Balance: $1076

Future Plans

- Remaining Fall Semester
  - *Build proof of concept model and industrial prototype*
  - *Finalize CAD package and BOM*
- Winter break
  - *Begin ordering necessary items/picking up at stores*
- Spring Semester
  - *Work towards final design and documentation*

Questions?

References

[1] H. D. P. Authority, "Everbilt 3/8 in. X 1 ft. Navy double Braid nylon rope-70416 - the Home Depot," The Home Depot, 2000. [Online]. Available: http://www.homedepot.com/p/Everbilt-3-8-in-x-1-ft-Navy-Double-Braid-Nylon-Rope-70416/206189264

[2] [Online]. Available: https://www.walmart.com/ip/Evenflo-Johnny-Jump-Up-Bumbly/22236459

[3] S. Inc, "100 ton spreader bar by niklscalemodels on Shapeways," Shapeways.com, 2014. [Online]. Available: http://www.shapeways.com/product/8KKCUWXYK/100-ton-spreader-bar?li=gmerchant&utm_source=googleshopping&utm_medium=cpc&gclid=Cj0KEQiAperBBRDfuMf72sr56fIBEiQAPFXszdx0LUu49fMgWIBHAKY3FANfdI7rXPutgWi_2c4GnvkaAqwb8P8HAQ&optionId=60897166

[4] Constantino, "Build your own professional DIY video Slider," Photo CS, 2012. [Online]. Available: https://photoscs.wordpress.com/2012/02/28/build-professional-diy-video-slider/

[5] 2016 A, "EZ up pyramid 10 x 10 new colors and features - FREE SHIPPING," 2013. [Online]. Available: http://www.ezup4less.com/acatalog/EZ-Up-Pyramid-10-x-10-New-Colors-and-Features-313.html?gclid=CjwKEAiA6rrBBRDsrLGM4uTPkWASJADnWZQ4RpZF4gObQzrEyuvQ7x1GavWraaVREZG6PMBRAXXrmhoCpWzw_wcB.

[6] S. Inc, "100 ton spreader bar by niklscalemodels on Shapeways," Shapeways.com, 2014. [Online]. Available: http://www.shapeways.com/product/8KKCUWXYK/100-ton-spreader-bar?li=gmerchant&utm_source=googleshopping&utm_medium=cpc&gclid=Cj0KEQiAperBBRDfuMf72sr56fIBEiQAPFXszdx0LUu49fMgWIBHAKY3FANfdI7rXPutgWi_2c4GnvkaAqwb8P8HAQ&optionId=60897166