Lerner Exoskeleton I

Team G:

- Mohammad Alajmi (Project Manager)
- Mahdi Alajmi
 - Saud Almutairi
 - Abdullah Alazemi

(Client Contact) (Web designer)

- (Document Manager1)
- Mohammad Alkhaldi (Document Manager2) Barjas Aldooseri (Budget Liaison)



Introduction

- Project Description
- Updates
- Moving Forward
- Hardware Review 2

Project Description

- The goal is to design adjustable system to help the disabilities people to walk from (13-75) ages.
- Robotic exoskeletons help neuromuscular disorder to walk.
- System provide assistance at the knee and ankle joints.
- Our Client is Zach Lerner, Ph.D, director of NAU's Biomechatronics Lab.



Figure 1: Adjustable Human-Exoskeleton Mounting Interface

Project Description



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Updates

- 50% of the design have been accomplished.
- The CAD package has been updated.
- Contract with Machine Shop.

Updates

Design changes:

- Changing the material from Carbon Fiber to thermoplastic due to the cost of the Carbon Fiber and it will take too much time for ordering it.
- Adding bearings for rotation.
- Change the thickness of the foot plate to make it thinner, to make the design more comfortable for the users.
- Adding multiple foot plate to adjust different size of limbs, by replacing the new one with the old one.

What is Left ?

- Attaching thermoplastic to the project instead of Carbon Fiber.
- Adding belts (velcro tape)
- Apply foam to the feet plates.
- Building a few different sizes of feet plate.
- Apply the connection parts for the motor.

Analytical Analyses

- LightWeight.
- Strength Material.
- Do on and Do off.

Moving Forward

- Our first priority is to improve the exoskeleton to make sure our users are comfortable while using it.
- Two connections part for the motor and thermo-plastic covering needed to be manufactured.
- Test the design between our team members and some volunteers.

Contingencies.

• Schedule:

Week 7 : Finalized the comments from Hardware Review 2 to our design and testing proof of our design.

• Budget :

As a team, we gathered \$300 for any additional redesigns.

Responsibility.

- **Saud :** Machine shop and updating the website.
- **Abdullah :** Edit presentation and update the team with the meeting minutes.
- Mahdi : Update the Gantt Chart and Solid work.
- Alajmi : Solid work and observing the team status.
- Alkhaldi : Edit reports and update the team with meeting minutes.
- **Barjas :** Budget responsibility and machine shop

Gantt Chart

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	G	AI	project			2017	1											
	Nam	ne		Begin date	End date	Week 22	Week 23 6/4/17	Week 24	Week 25 6/18/17	Week 26 6/25/17	Week 27	Week 28	Week 29	Week 30	Week 31	Week 32 B/6/17	Week 33 B/13/17	Week 34 8/20/17
		• 5	itaff Meeting 3	4/10/17	4/17/17							7/11/	17					
		⊖ F	inal Project Proposal Report	4/10/17	4/17/17													
		⊖ F	inal Presentation	4/20/17	4/20/17													
		• 7	7.0 Frist ME486 meeting (Mahdi)	6/5/17	6/5/17		լ											
	Ψ.	e و	3.0 Frist Staff meeting (Team)	6/6/17	6/8/17													
			 8.1 Resubmission of Final Proposal (Mahdi, Alkhaldi) 	6/6/17	6/6/17													
			 8.2 Issues with the machine shop (Saud, Barjas) 	6/7/17	6/7/17													
			 8.3 Contact our client for changes(Mahdi, Saud) 	6/8/17	6/8/17													
	Ψ.	• •	9.0 Hardware Review 1 (Team)	6/19/17	6/22/17													
			 9.1 Researches for thermoplastic (Abdullah, Barjas) 	6/19/17	6/19/17	e												
١.,			 9.2 Gantt chart & contacting the client (Mahdi) 	6/20/17	6/20/17													
			 9.3 50% of the design done (Team) 	6/21/17	6/21/17													
			 9.4 Different sizes for the feet (Saud, Moahmmad) 	6/22/17	6/22/17		_											
		0]	10.0 Second team meeting (Mohammad)	6/27/17	6/29/17	_	_											
		0]	11.0 Third team meeting (Alkhaldi)	7/4/17	7/6/17	_	_											
	•	0]	12.0 Midpoint Report due (Team)	7/5/17	7/7/17		_											
	,	•	 12.1 Implementation (Team) 	7/5/17	7/7/17		_											
			 12.1.1 Analytical analyses 	7/5/17	7/5/17		_	_										
			 12.1.2 Design Changes 	7/7/17	7/7/17	_	_	_										
	1	0]	13.0 Midpoint Presentation (Team)	7/11/17	7/13/17		_	_										
		•]	14.0 Hardware Review 2 (Team)	7/11/17	7/13/17	-	_							_				_
		0]	15.0 Final Product Testing Proof (Barjas)	7/25/17	7/28/17	_												
		•]	L6.0 Final Presentation and Poster (Team)	8/1/17	8/3/17	_										_		
		0]	17.0 Final Report and CAD package due (Team)	8/8/17	8/8/17													

Figure 3: Gantt Chart

Mahdi Alajmi- 07/12/2017 – Lerner Exoskeleton – Team G



Project Budget : \$500

Total Amount Available: \$(-823)

Actual Expenses to Date:\$1323



Changes.

• Updating the Gantt chart with the updated tentative schedule.

• Requesting more \$500 from the Mechanical Department.

Hardware Review2

 Design will work after having some feedback from the second hardware review, and it will work before the Product Testing Proof.

• How system work?

Questions?

• Thank you for your attention.