Human Exoskeleton

Team J

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Khaled Alzafairi - 04.24.2017 - Lerner-Exoskeleton-Mount

Project Description

- The project is about designing an Adjustable Human-Exoskeleton Mounting Interface.

➢ Client's Information :

Zach Lerner, Ph.D.
Director of NAU'S Biomechatronics Lab.

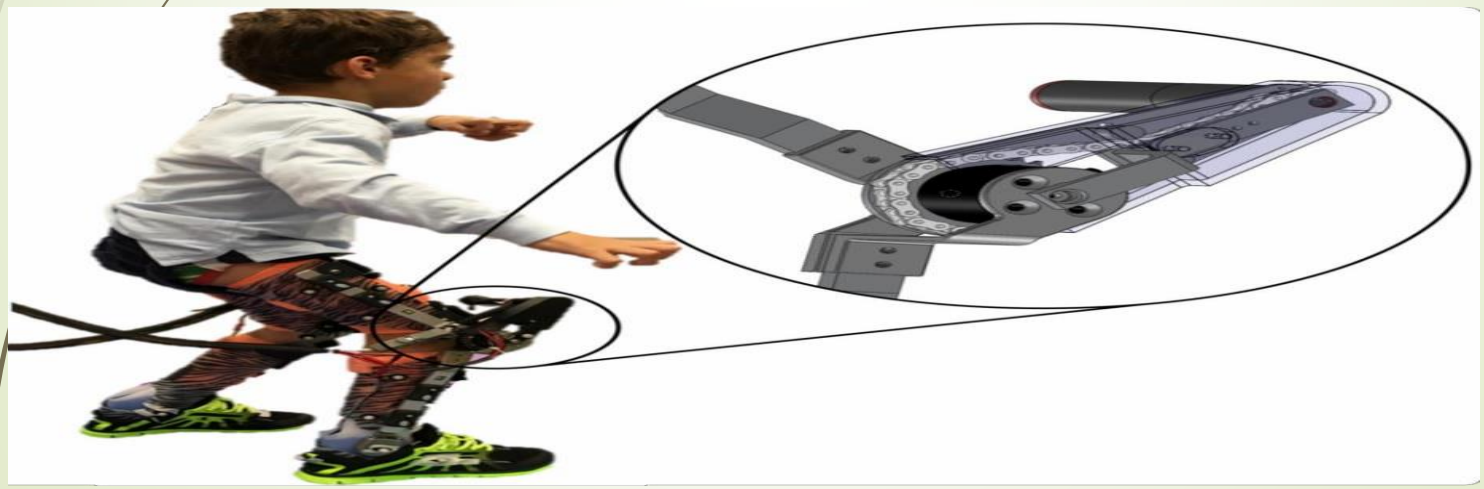


Figure 1 : Human Exoskeleton Mounting Interface.

Design Description

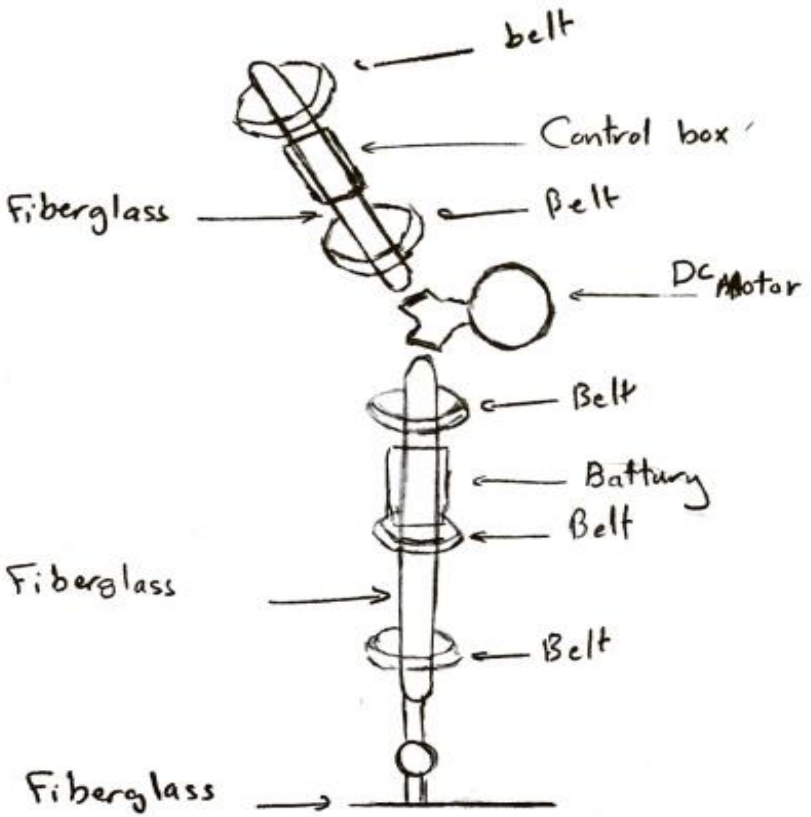


Figure 2 : Final Design

Design Function

- Belts
- Motor
- Fiber Glass
- EE System :

Control Box
Sensor
Battery

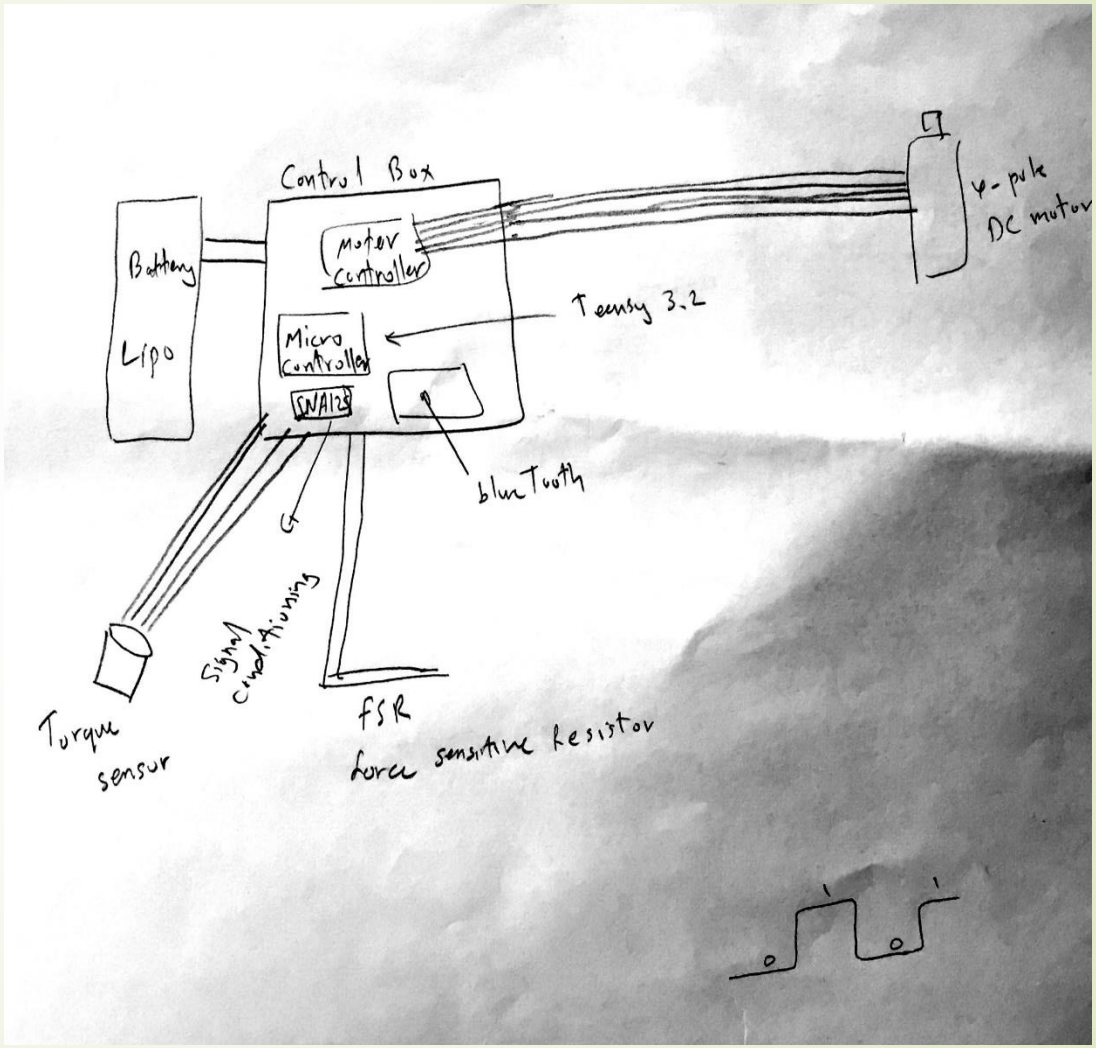


Figure 3 : Control Box

Design Requirements

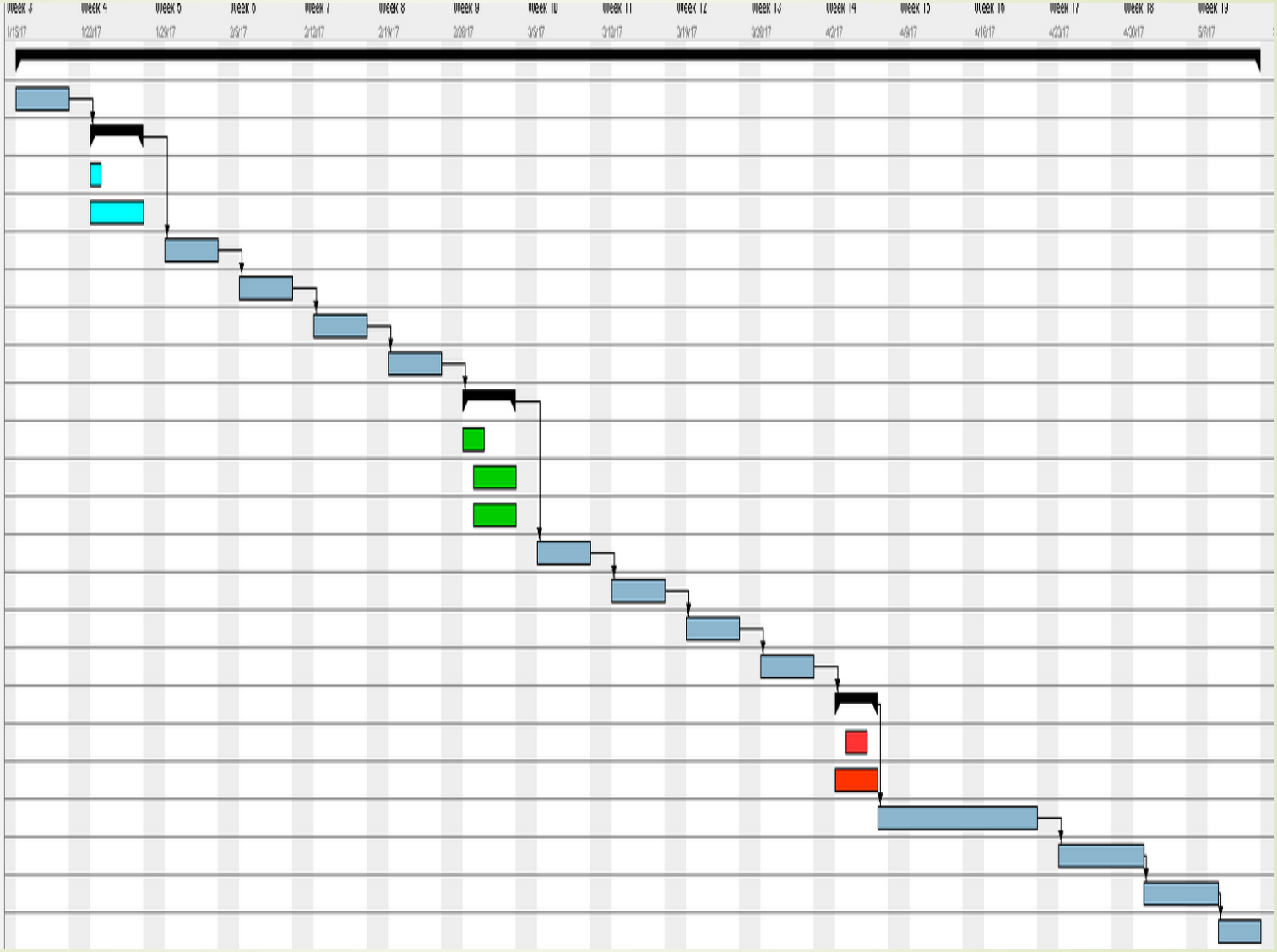
- Light in weight
- Adjustable
- Provide rigid mounting points to the thigh, shank and foot
- Low Profile
- Minimize skin irritation

House of Quality

Customer Requirement	Weight	Engineering Requirement	Yield strength of at least 40 N/m^2	Adjustable to a length ranging 6 to 20	Time to don/doff 30 sec-5 min	Limited weight of 0.75 kg/limb	No dimensions beyond the knee of 5cm
Should be adjustable	4			5			4
Have good mounting grip	5		4				
Easy to wear and remove	4				5	3	4
Reduce the irritation caused by the fabric	4						4
Compatibility with shoes and clothing	3			3	4		
Strong and lightweight	5		5			5	5
Absolute Technical Importance (ATI)							
The Relative Technical Importance (RTI)							
Target(s)							
Tolerance(s)							
The Testing Procedure (TP#)							

Schedule & Budget

Name	Begin date	End date
Human Exoskeleton Prject	1/16/17	5/12/17
Class Intro, Project Descr...	1/16/17	1/20/17
Team Meetings	1/23/17	1/27/17
Divide the work for t...	1/23/17	1/23/17
review the rules	1/23/17	1/27/17
Report Writing and Pres...	1/30/17	2/3/17
Staff Meetings	2/6/17	2/10/17
Presentation 1	2/13/17	2/17/17
Lecture 2	2/20/17	2/24/17
Team Meeting	2/27/17	3/3/17
functional modeling	2/27/17	2/28/17
Black Box	2/28/17	3/3/17
HoQ	2/28/17	3/3/17
Staff Meetings	3/6/17	3/10/17
Spring Break	3/13/17	3/17/17
Presentation 2	3/20/17	3/24/17
Lecture 3	3/27/17	3/31/17
Team Meetings	4/3/17	4/6/17
Final Presentation	4/4/17	4/5/17
Final Proposal	4/3/17	4/6/17
Staff Meetings	4/7/17	4/21/17
Final Presentation	4/24/17	5/1/17
Final Project Proposal Re...	5/2/17	5/8/17
Staff Meetings	5/9/17	5/12/17



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Budget ($500+Electric System)

- Estimated Cost :

1- Materials (40%)
2- Advertisment (20%)
3- Manufacturing (30%)
4- Prototyping (10%)

- Electric System :

1- FSR ($20.95)
2- Micro-controller ($22.80)
3- Blue-tooth ($24.95)
4- Torque Sensors ($675.00)
5- Li-Po Battery ($62.99)

Questions ?