CURRENT HARDWARE BUILD

PII:Robotic Arm Exoskeleton Colin Cipolla Jordan Finger Dylan Kurz Michael Marchica Michael George

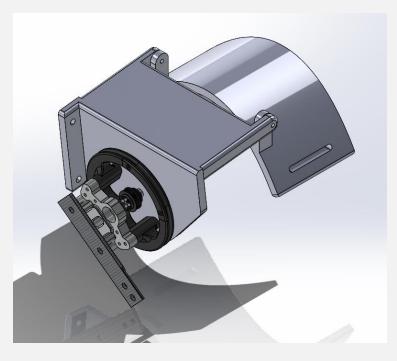


GANTT CHART UPDATE

		Display Week:	4		Feb	o 6, 20	23	F	eb 13	, 202	3	Fel	o 20, 2	023		Feb	27, 2	2023		Ma	r 6, 20)23
				1			10 11			16 1	7 18 19	20 2:	1 22 2	3 24 2	25 26	27 28	1 2	2 3	45	67	89	10 11 12
TASK	ASSIGNED TO	PROGRESS	START	END	МТ	V T	FS	ѕм	т м	TF	ss	мт	W 1	F	ss	МТ	W .	T F	s s	МТ	W T	FSS
Prep for 33% Build																						
Client Meeting #2	Team/Client	100%	2/10/23	2/10/23																		
Order Necessary Parts	Team	100%	2/6/23	2/10/23																		
33% Build	Team	90%	2/10/23	2/13/23																		
33% Build Presentation	Team	25%	2/13/23	2/13/23																		
33% to 67% Build																						
Revise Design, Update CAD	Team	50%	2/14/23	2/17/23																		
Client Meeting #3	Team	0%	2/20/23	2/24/23																		
Finalize Redesign, Print Parts	Team	0%	2/24/23	2/24/23																		
Order Remaining Outsourced Parts	Team	0%	2/27/23	3/3/23																		
Test Design	Team	0%	2/27/23	3/3/23																		
67% Presentation	Team	0%	3/6/23	3/6/23																		
67% Build Complete	Team	0%	2/15/23	3/7/23																		

DESIGN PROGRESSION

Fall 2022 Prototype



First Ball and Socket Design

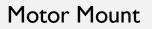


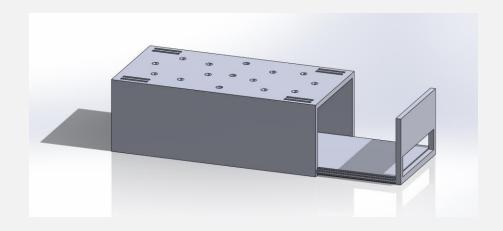
Current Ball and Socket



CURRENT CAD MODELS

Ball & Socket Assembly

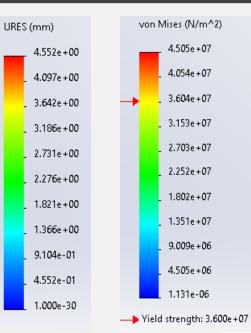




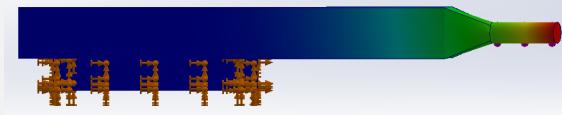


FEA

- Most vulnerable component is the shoulder bar.
- Assuming all 120N of force from the motor is transferred into the part which gives an overestimation.
- As expected the critical point will not withstand the forces



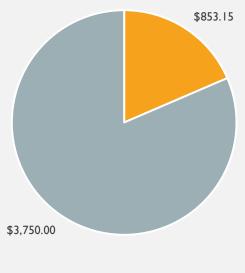
Property	Value	Units
Elastic Modulus	240000000	N/m^2
Poisson's Ratio	0.35	N/A
Shear Modulus	318900000	N/m^2
Mass Density	1200	kg/m^3
Tensile Strength		N/m^2
Compressive Strength		N/m^2
Yield Strength	3600000	N/m^2



PURCHASING PLAN

Bill of Materials:	Quantity:		Vendor/Manufacturer:	Part Status:	Total Cost:
Shoulder Plate	1	Manufactured	Team	Finalizing Design	\$2.25
Socket Joint	1	Manufactured	BIO Mechatronics Lab	Finalizing Design	\$41.04
Large Pulley	1	Manufactured	BIO Mechatronics Lab	Finalizing Design	\$8.00
Large Pulley Bridge	1	Manufactured	BIO Mechatronics Lab	Finalizing Design	\$1.00
Ball Joint Bar	1	Manufactured	BIO Mechatronics Lab	Redesigning	\$11.13
Ball Joint	1	Manufactured	BIO Mechatronics Lab	Finalizing Design	\$1.34
Motot Mount Box Lid	1	Manufactured	Team	Finalizing Design	\$2.31
Motor Mount Box	1	Manufactured	Team	Completed	\$6.75
Bicep Cuff	1	Manufactured	Team	Completed	\$1.83
Bicep Mount Upper	1	Manufactured	BIO Mechatronics Lab	Waiting on BIO MECH	\$1.00
Blcep Mount Lower	1	Manufactured	BIO Mechatronics Lab	Waiting on BIO MECH	\$1.00
Harness System	1	Modified	Amazon	Delivered	\$34.00
Strapping 10 Yard	1	Modified	Amazon	Delivered	\$12.16
Motors AK 60-6	2	Buy-Out	T-Motor	Delivered	\$599.00
Bowden Cables 5'	4	Buy-Out	Absolute Bikes	Delivered	\$43.00
6-32 x1in Bolts	8	Buy-Out	The Home Depot	Delivered	\$1.38
6-32 Nut	8	Buy-Out	The Home Depot	Delivered	\$1.38
#6 Washers	12	Buy-Out	The Home Depot	Delivered	\$1.38
6-32 Nylock Nuts	4	Buy-Out	The Home Depot	Delivered	\$1.38
4-1 1/2 Sheet Metal Screws	4	Buy-Out	The Home Depot	Delivered	\$1.38
8-32 x 1 1/2 Bolts	8	Buy-Out	The Home Depot	Delivered	\$1.38
8-32 x 1 Bolts	8	Buy-Out	The Home Depot	Delivered	\$1.38
8-32 Nuts	4	Buy-Out	The Home Depot	Delivered	\$1.38
8-32 Nylock	4	Buy-Out	The Home Depot	Delivered	\$1.38
#8 Washers	12	Buy-Out	The Home Depot	Delivered	\$1.38
Shoulder Tube	2	Buy-Out	dragonplate.com	Unpurchased	\$73.54

Budget Utilization



Total Cost Total Budget

\$853.15

MANUFACTURING PLAN

- Currently Manufactured -
 - Ball and socket shoulder joint
 - Sliding shoulder plate
 - Bicep cuff
 - Motor mount
 - Harness
- In Progress -
 - Bowden cable routing
 - Motor attachment
- Yet to be started -
 - Additional shoulder pivot joint
 - Battery location and housing

Shoulder Plate	1	Manufactured	Team
Socket Joint	1	Manufactured	BIO Mechatronics Lab
Large Pulley	1	Manufactured	BIO Mechatronics Lab
Large Pulley Bridge	1	Manufactured	BIO Mechatronics Lab
Ball Joint Bar	1	Manufactured	BIO Mechatronics Lab
Ball Joint	1	Manufactured	BIO Mechatronics Lab
Motot Mount Box Lid	1	Manufactured	Team
Motor Mount Box	1	Manufactured	Team
Bicep Cuff	1	Manufactured	Team
Bicep Mount Upper	1	Manufactured	BIO Mechatronics Lab
Blcep Mount Lower	1	Manufactured	BIO Mechatronics Lab

DEMONSTRATION