- **Title**: Preventing Weightlifting Injuries by Barbell Modifications, Weightlifting Injuries, BME301

- **Date**: 4/18/24 - 4/25/24

Last Name	First Name	Role	Email
Settell	Megan	Advisor	settell@wisc.edu
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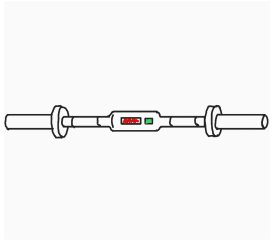
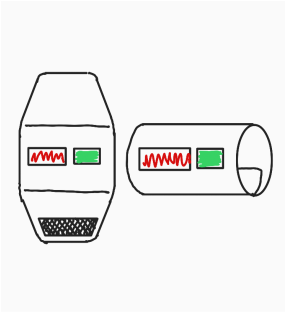
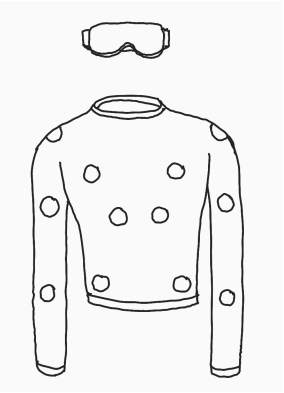
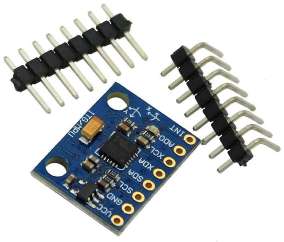
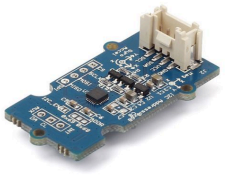
- **Problem statement**: Over one million weightlifters each year experience weightlifting injuries that put them in the emergency room. Of these one million, 18-46% are reported to be caused by bench pressing a barbell. Our team's task is to create a marketable system that increases safety for lifting, specifically bench pressing.

- **Brief status update**: We are finishing up the final prototype and wrapping up our poster presentation.

- **Difficulties / advice requests**: No difficulties or advice requests for this coming week.

- **Current design**: After show and tell, the design has been slightly changed from multiple sensors to one sensor that points to the ground due to rotation of a bell bearing system.

Design	Full barbell		**Barbell attachment**		Full suit + VR	
						
Safety (25)	4/5	20	5/5	25	5/5	25
Ease of Use (20)	4/5	16	5/5	20	2/5	8
Uniqueness (20)	3/5	12	2/5	8	5/5	20
Marketability (20)	3/5	12	4/5	16	5/5	20
Cost (10)	3/5	6	5/5	10	1/5	2
Ease of Fabrication (5)	2/5	2	4/5	4	1/5	1
Overall Score:	68		83		76	

Technology	Radar/Lidar		Accelerometer		IMU	
						
Accuracy (25)	5/5	25	4/5	20	3/5	15
Reliability (25)	3/5	15	4/5	20	4/5	20
Marketability (20)	5/5	20	2/5	8	3/5	12
Cost (15)	2/5	6	4/5	12	3/5	9
Ease of Fabrication (10)	2/5	4	4/5	8	3/5	6

Safety (5)	5/5	5	5/5	5	5/5	5
Overall Score:	75		72		67	

- **Materials and expenses**: a concise accounting of the amounts and types of expenses incurred on the project. Use the template provided here: http://bmedesign.engr.wisc.edu/course/resources/#bpag

Item	Description	Manufacturer	Mft Pt#	Vendor	Vendor Cat#	Date	QTY	Cost Each	Total	Link
Ultrasonic Sensors										
CUI Ultrasonic	Ultrasonic Sensor	CUI		CUI Devices		3/14	2	$6.70	$22.93	url
Max Ultrasonic	Ultrasonic Sensor	Max Sonar		MaxBotix		3/14	2	$29.95	$68.95	url
Other										
Power Supply	Battery used to supply power to screen attachment			Amazon		4/14	1	$29.95	$29.95	url
Screen	Display attached to center of barbell			Dr. Nimunkar		4/14	1	$0	$0	url
Velco	Used to attach housing blocks to barbell			Amazon		4/14	1	$9.99	$9.99	url
Wire Components	Extra electrical components to attach everything			Makerspace		4/14	1	$0	$0	url
Housing Block	3D Printed Housing chamber			Makerspace		4/19	1	$18.28	$18.28	url
Raspberry Pi Pico W	Used to gather data from ultrasonic sensors and wirelessly transmit it to the main terminal			Amazon		4/14	3	$27.99	$27.99	url
Battery Housing	Holds 3 AA batteries to power the Pico W microcontrollers			Amazon		4/14	3	$6.99	$6.99	url
AA Batteries	AA Batteries to power Pico Ws			Amazon		4/14	10	$14.32	$14.32	url
								TOTAL:	**$181.12**	

- **Major team goals for the next week**: Complete Final report deliverable

- **Next week's individual goals**: A concise statement of intended action to continue progress on the project - be specific, i.e. what will you research.

  Kaden: Complete the final report.

  Jacob: Complete final report and update notebook.

  Nolan: Finish final report

  James: Update design notebook and write up final report.

Project Goal	Deadline	Assigned	Progress	Completed
Initial meeting with client	1/31	Team	100%	Y
Gather research/project information	2/2	Team	100%	Y
Product Design Specification (PDS)	2/8	Team	100%	Y
Design Matrix	2/15	Team	100%	Y
Preliminary Presentation PDF	2/26	Team	100%	Y
Preliminary Report	3/1	Team	100%	Y
Order/Gather Materials	3/20	Team	100%	Y
Create prototypes, test	4/22	Team	100%	Y
Final fabrication	4/22	Team	100%	Y
Test and finalize final design	4/22	Team	100%	Y
Poster Presentation PDF	4/22	Team	100%	Y
Final Report	5/1	Team	50%	N
Final Notebook Team	5/1	Team	50%	N

- **Previous week's goals and accomplishments**:

  Team: Working on getting a prototype made.

  Kaden: Fabrication and Work on poster

Jacob: Completed display code and code to measure ultrasonic sensor distances. Set up sensor, pico, serial display, and pi4 to work in conjunction, and helped conduct testing.

Nolan: Started and worked on final report, display code with Jacob, completed display attachment.

James: Help complete testing for the prototype and prepare the poster for the presentation.

Activities: a concise accounting of time spent working on the project.

	Kaden	Jacob	Nolan	James
Week 1	2.5hrs	2.5 hrs	3 hrs	2.5 hrs
Week 2	2 hrs	1.5 hrs	2 hrs	1.5 hrs
Week 3	1.5 hrs	1.5 hrs	1.5 hrs	1 hr
Week 4	2.5 hrs	2 hrs	1.5 hrs	1 hr
Week 5	2 hrs	1.5 hrs	1.5 hrs	1.5 hrs
Week 6	2.5 hrs	3 hrs	2 hrs	2.5 hrs
Week 7	1.5 hrs	1.5 hrs	1.5 hrs	1.5 hrs
Week 8	2 hrs	5 hrs	2 hrs	3.5 hrs
Week 9	2 hr	1.5 hrs	1.5hrs	1 hr
Week 10	2.5 hrs	1.5 hrs	2.5hrs	2.5 hrs
Week 11	5 hrs	5.5 hrs	5 hrs	6.5 hrs
Week 12	4 hrs	20 hrs	4.5 hrs	12 hrs