HR 2 BREAKDOWN

TEAM: NAU Robotic Explorer 20F11

Due Date:
Friday, March 6, 2020 at 11:59pm

Provide several pics of the current state of your completed system thus far here:

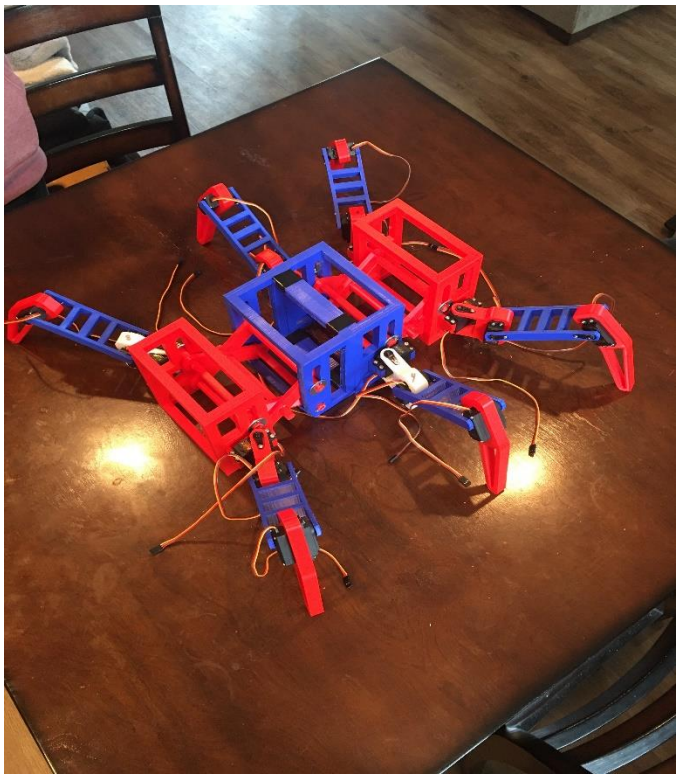


Figure 1. Small-scale Psyche rover model

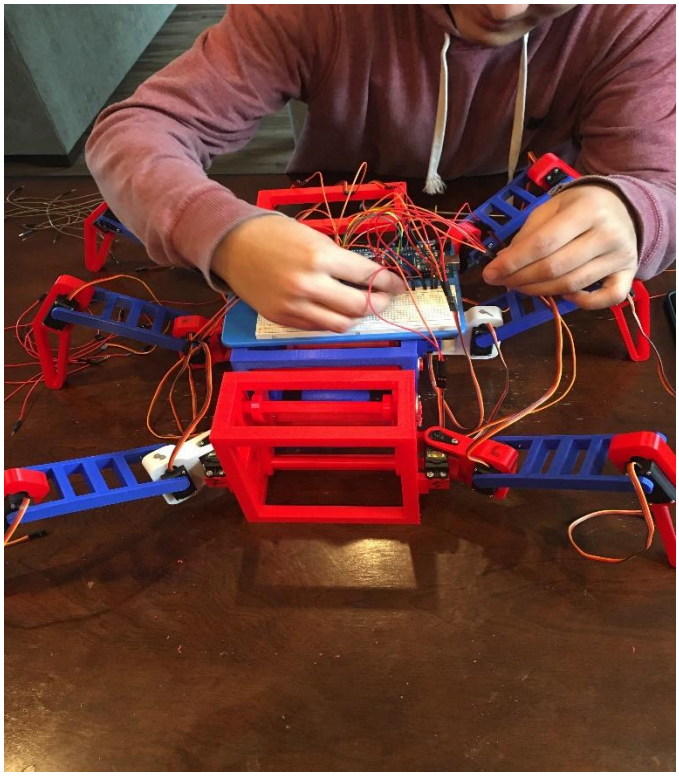


Figure 2. Wiring of the servos for the small-scale model

Figure 3. Full-scale leg model base planetary gear box.

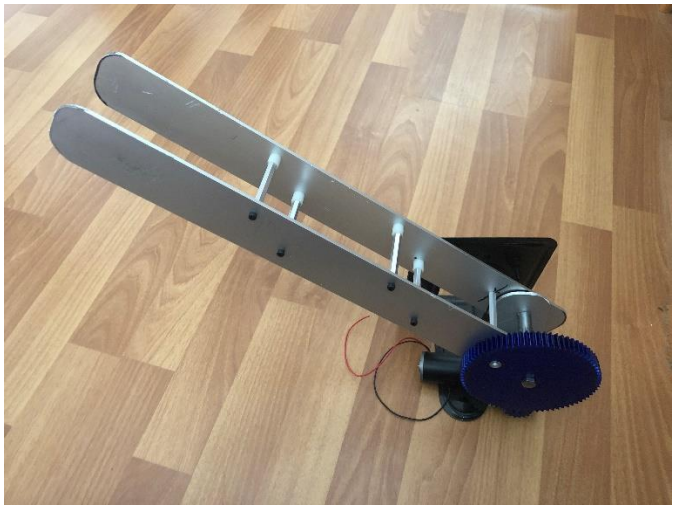
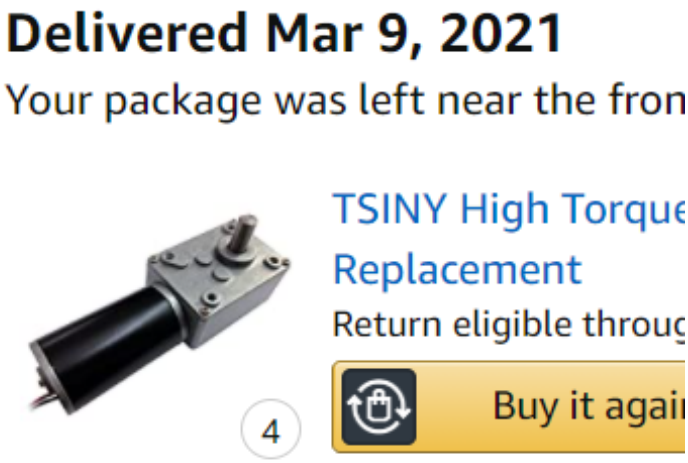


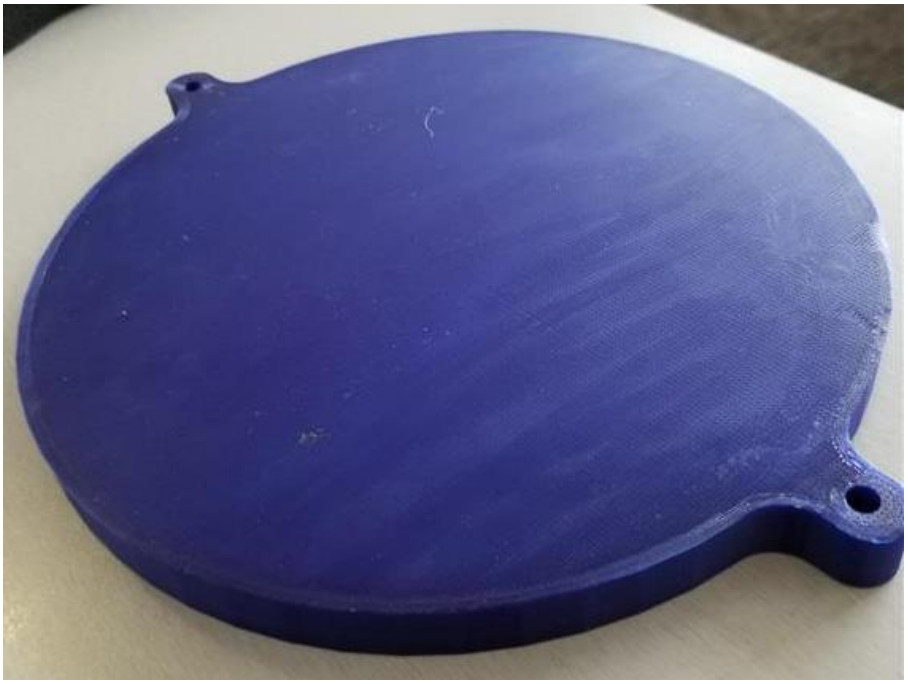
Figure 4. Full-scale leg model leg segment.

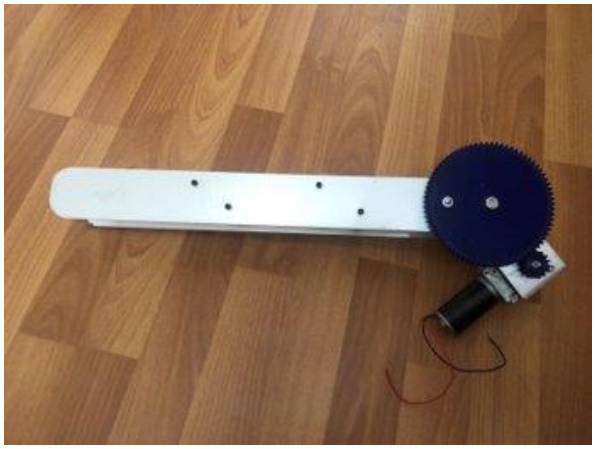
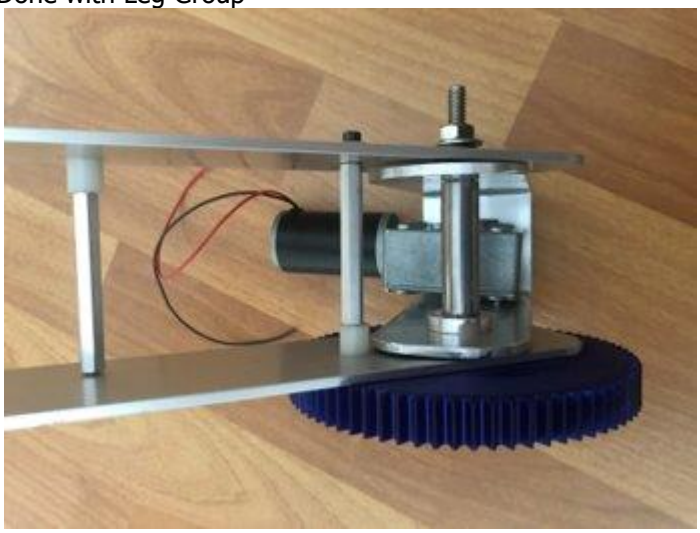
The following are the Action Items each person completed between Hardware Review 1 and Hardware Review 2:

Team Member: Eric "Sean" Sullivan

Action Item	Date Completed	Result/Proof of Completion
Order motors	March 5th, 2021	
Solder Motor Controllers	2 of 3 done on 03/08/2021.	Two of three controllers were soldered correctly. One was damaged beyond repair. Replacement was ordered on 03/08/2021 and delivered on 03/11/2021 yet to be soldered.

		
3D Print Ring Gears	03/07/2021	
3D Print Planetary Housing	03/15/2021	

3D Print Arm Gears	03/09/2021	
3D Print LID	03/25/2021	
Cut metal for arms.	03/15/2021	Done with Leg Group

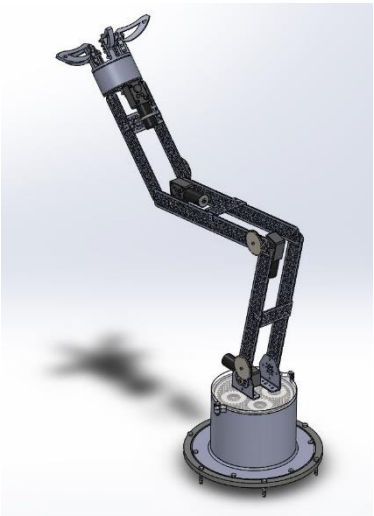
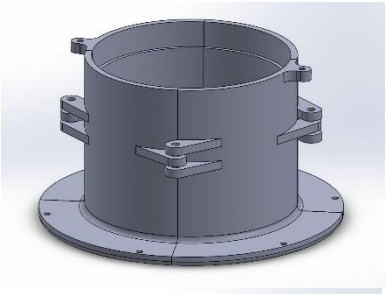
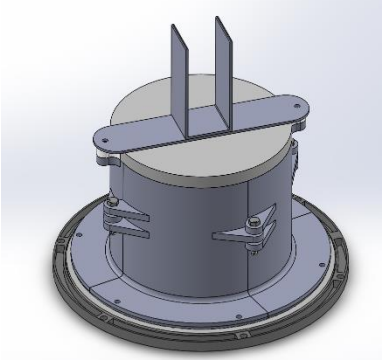
		
Create Metal Arm Base Bracket	Bending done on 03/15/2021 Drilling 03/20/2021	Done with Leg Group 
Begin Assembly of full-scale model.	03/20/2021	Assembly was started on the Saturday build day and will be continued this weekend.

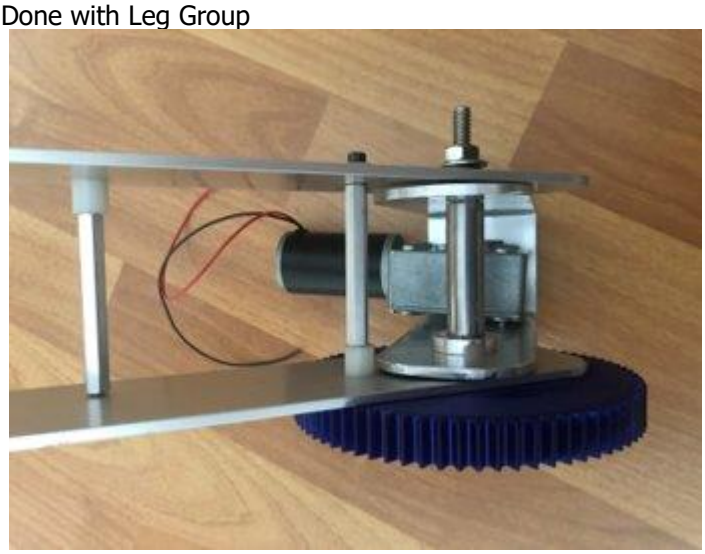
Team Members: John Dynda and Isaac Anderson

Action Item	Date Completed	Result/Proof of Completion
Redesign leg segments 1 and 2 in SolidWorks for tighter servo tolerance fits.	3/3/21	These leg segments were revised in SolidWorks to allow a better fit for the servos. The previous leg segments provided a loose fit with the servos, resulting in less than adequate performance of the servos.
Reprint shafts for the scissor lift portions on the small-scale model.	3/20/21	Reprinted 4 instances of the shafts for the scissor lift portions of the small-scale model. The diameter of the previous shafts was too large to fit the arms of the scissor lift portions.
Finish printing all parts for the small-scale rover model.	3/20/21	Finished printing all the parts for the small-scale model after redesigning some of them in SolidWorks. Ensured that the newly printed parts will fit together to form the small-scale model without any major assembly issues.
Finish assembling the small-scale model. 3.8"	3/24/21	
Organize program for small-scale rover movement.	3/24-3/25	Worked to reorganize the code for movement of the small-scale model. The newly organized code is simpler and easier to follow. This action is still in progress but will be completed by 3/31/21.
Rewired servos for small-scale model.	3/24/21	

Designed new holder for Arduino components, more compact to fit nicely inside the small-scale model.	3/24/21	

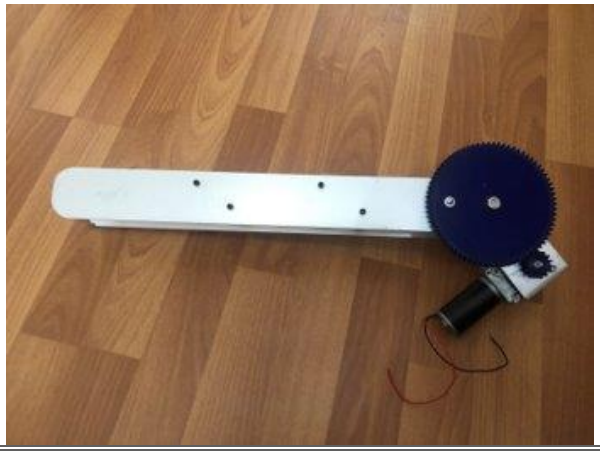
Team Member: Kate Collette

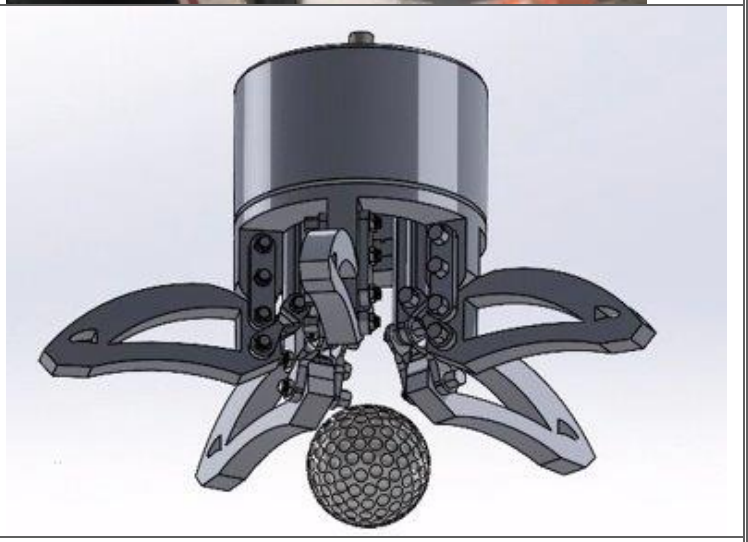
Action Item	Date Completed	Result/Proof of Completion
Completed entire CAD model of full-scale	03/07/2021	
Revised CAD model periodically	03/07/2021-03/25/2021	 

Uploaded files to be printed.	03/07/2021- 03/25/2021	Continually uploaded stl files for stuff to be printed, including resizing parts to fit better, or modifying parts to fir on build plate.
Determined parts team needs to order to move forward with full scale model.	03/07/2021	**Kate Collette** <kmc669@nau.edu> to Isaac M7x1 40mm long Bolts - 1x25 pack: https://www.mcmaster.com/91280A423/ M6x1 20mm long Bolts - 1x50 pack: https://www.mcmaster.com/91310A333/ M6x1 30mm long bolts -1x50 pack: https://www.mcmaster.com/91310A338/ M6 hex nut - 1x100 pack: https://www.mcmaster.com/90592A016/ M7 hex nut - 1x100 pack: https://www.mcmaster.com/90592A018/ Ball Bearing - 4x1 pack: https://www.mcmaster.com/60355K505/ Round Turntable - 1x1 pack: https://www.mcmaster.com/18635A52/ Thanks Isaac! Let me know if you have any questions.
Cut metal for arms.	03/15/2021	Done with Leg Group 
Create Metal Arm Base Bracket	Bending done on 03/15/2021 Drilling 03/20/2021	Done with Leg Group 
Begin Assembly of full-scale model.	03/20/2021- 03/26/2021	Done with leg group.

Team Member: Jacob Sasse

Action Item	Date Completed	Result/Proof of Completion
Completed an analysis on the motor strength.	3/8/21	Through the technical analysis, found that the motors purchased for the leg model should be powerful enough with our chosen gear ratio.
Assembled most of the base of the leg model.	3/15/21	
Helped cut aluminum for the leg segments.	3/15/21	

With the team, manufactured the leg segments and built the first segment of the model.	3/20/21	
After he first segment was built, the model was tested with the battery seen in the image to the right.	3/20/21	
Completed resizing the claw CAD to better fit the Leg model size.	3/25/21	

Team Member: Chad Schafer

Action Item	Date Completed	Result/Proof of Completion

Researched programming	3-8-21	Researched coding examples the team could use to connect the 5 motors to a ps2 controller.
Started assembling the base of the full-scale leg model.	3-15-21	
Cut the aluminum to the desired specifications.	3-15-21	
Initial Test	3-20-3-26	

Attached motor to the bracket and gears.	3-20-21	
Drilled the holes in the aluminum.	3-20-21	
Finished assembling the base of the full-scale leg model.	3-20-21	

The following are the Action Items for each team member between HR 2 and the Final Product presentation:

Team Member	Action Items	Date Due

Isaac Anderson	1. Work with John to finish programming the servos for the small-scale model. 2. Test the small-scale model walking on various surfaces after programming is completed. 3. Work with teammates on final presentation. 4. Work with teammates on operations and assembly manual for the small-scale rover model. 5. Work with teammates on final report. 6. Work with teammates on capstone poster.	1. 3/31/21 2. 4/2/21 3. 4/8/21 4. 4/16/21 5. 4/23/21 6. 4/23/21
John Dynda	1. Work with Isaac to program the small-scale model to successfully walk forward. 2. Rewire the small-scale rover with the new mount to make the rover look cleaner. 3. Test the model by having it walk on different surfaces with different coefficients of friction. 4. Help the full-scale leg model team out if the work on the small-scale rover is complete. 5. Work with all teammates to write the final report and create the final presentation for both our client and UGRADS. 6. Work on the capstone poster and hope that its cool enough to get printed out and hung up in the EGR building.	1. 3/31/21 2. 3/25/21 3. 4/2/21 4. 4/7/21 5. 4/23/21 6. 4/23/21
Jacob Sasse	1.	1.
Kate Collette	1. Work on completing full-scale leg model build. 2. Wire full-scale leg model. 3. Work on programming with leg team 4. Test full-scale leg model actuation and grip strength 5. Client presentation 6. UGRADs final presentation 7. Final product meeting 8. Operation and Assembly Manual 9. Final poster 10. Final Report 11. Final CAD package w/ BOM	1. 3/28/21 2. 4/4/21 3. 4/7/21 4. 4/23/21 5. 4/5/21 6. 4/8/21 7. 4/16/21 8. 4/16/21 9. 4/23/21 10. 4/23/21 11. 4/26/21
Eric "Sean" Sullivan	1. Order Motors from Amazon 2. Solder Motor Controllers 3. 3D Print Ring/Sun/Planetary Gears 4. 3D Print Planetary Gear Housing 5. 3D Print Arm Gears 6. 3D Print Lid 7. Cut Metal for Arms with Leg group 8. Bend Metal for Arm Bracket with Leg group 9. Begin Assembly with Leg group	1. 03/05/2021 2. 03/08/2021 3. 03/07/2021 4. 03/15/2021 5. 03/09/2021 6. 03/25/2021 7. 03/15/2021 8. 03/15/2021 9. 03/20/2021

Chad Schafer	1. Work on completing the full-scale model. 2. Work on the programming the motors 3. Work on programming the Arduino w/ps2 controller 4. Client presentation 5. Final poster 6. Work on the final report/presentation	1. 3/28/21 2.4/4/21 3.4/6//21 4.4/8/21 5.4/23/21 6./23/21