

Au

Industries

“Go for gold!”

Note: Modified PPTX to remove faces to keep privacy.

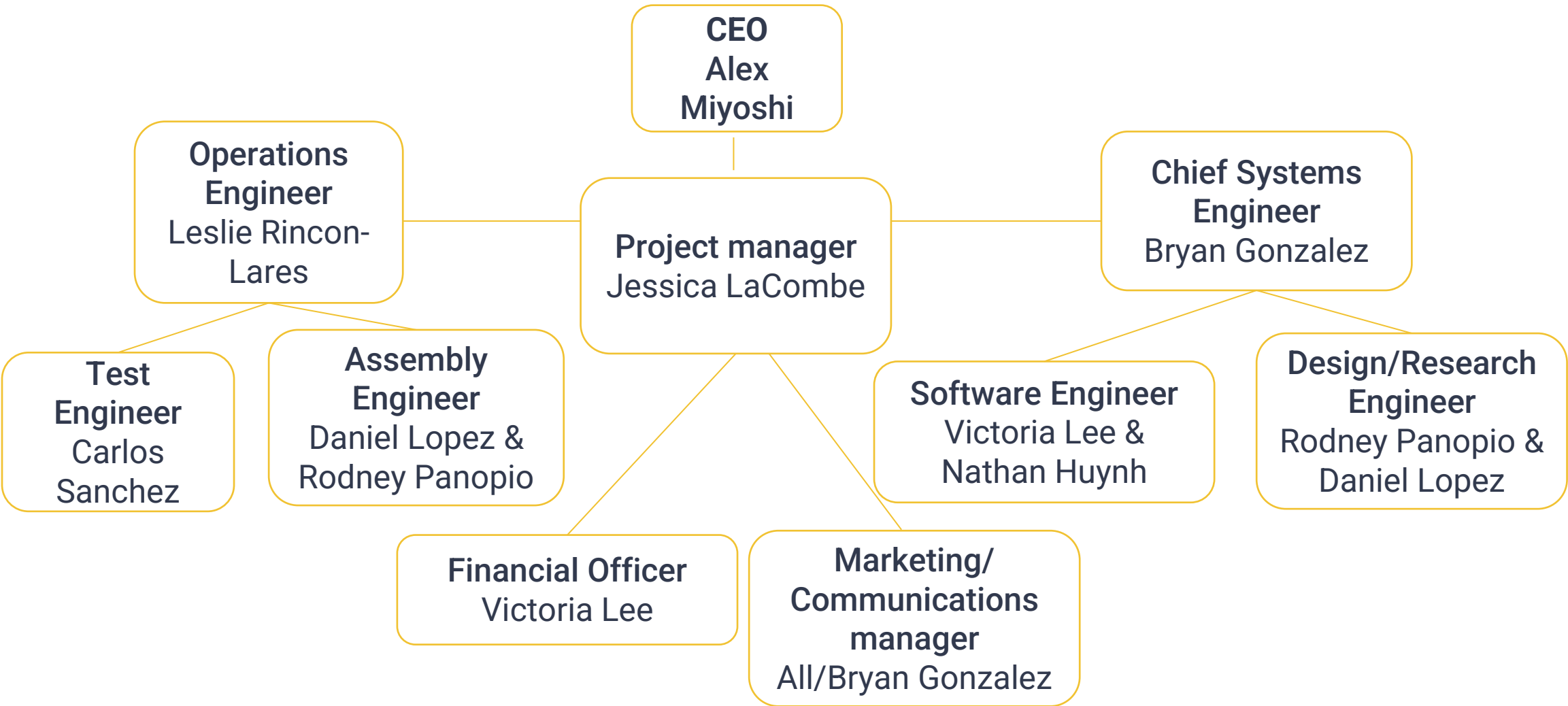
Mission statement

- Paving the way for human exploration to mars and beyond

“We can’t have success without failure”



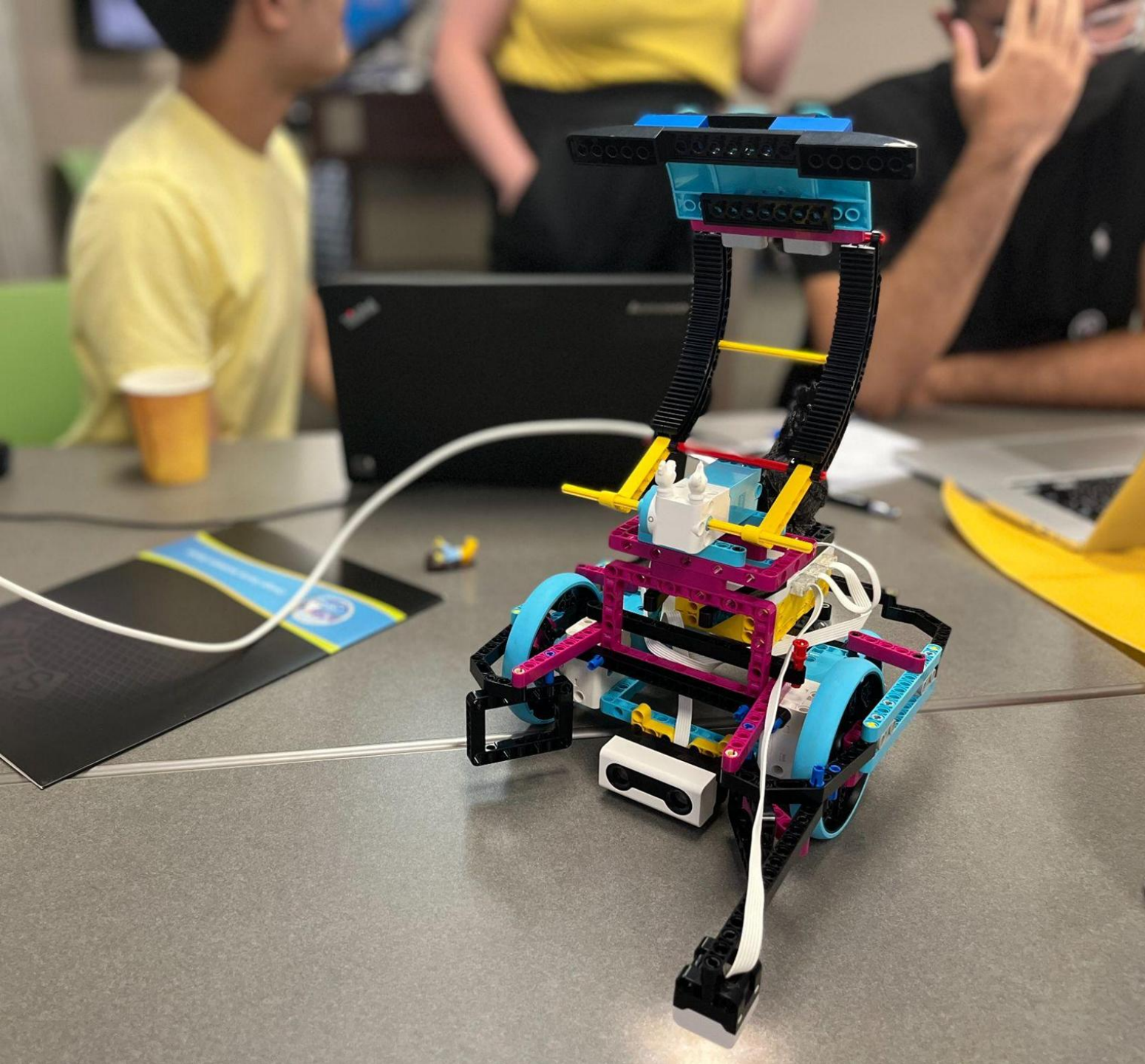
Company Organization Chart



Instrumentation

- Materials used for the production of our rover, “Gold Digger”, was the **Lego education Spike Prime**.
- Main pack and expansion pack were used, only necessary materials were purchased.





Au Industries

Presents

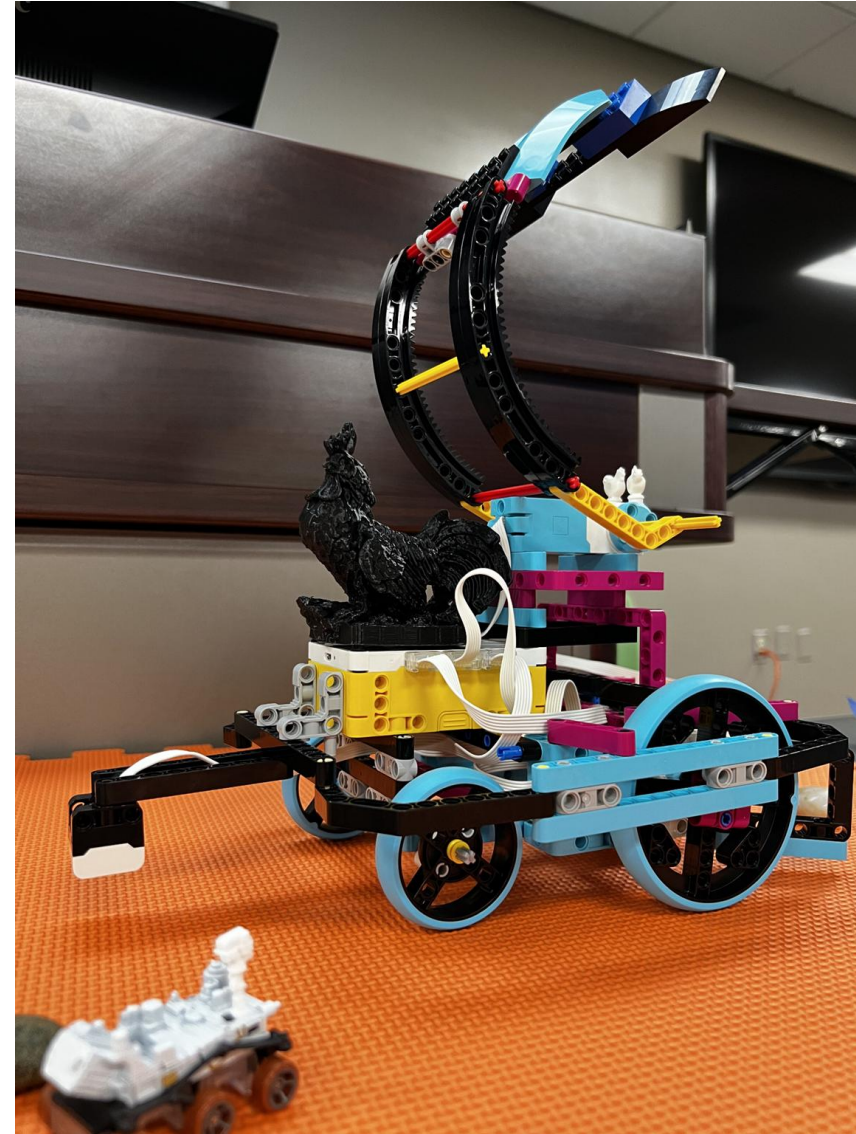
Gold Digger 2.0

“Goldie”



Creative Design

- Retrieval mechanism.
- Mechanical power:
 - 2 medium size engines for front wheel drive.
- Wheel guards that redirect desired objects.
- Chicken mascots (very important for performance.)



Brains & Power

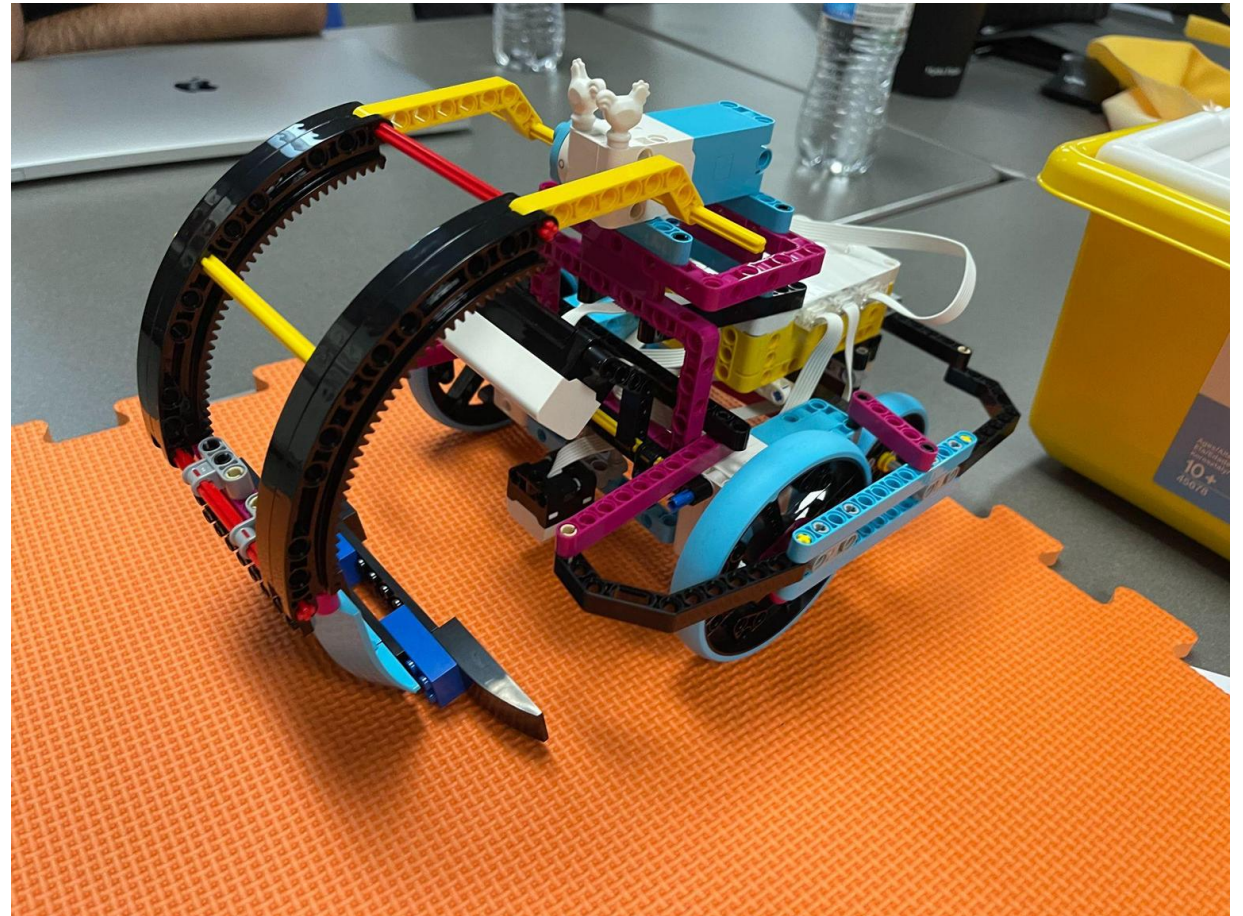
- Main Control Unit (Hub)
 - Stores coding software
 - Motors/Sensors are connected to 6 ports: “A-F”
 - Multiple mounting points available
- Battery Pack (Rechargeable)
 - Lithium-ion polymer battery enclosed by the hub
 - Specifications
 - Rating: 2,100 mAh
 - Voltage: 7.3 V
 - Life Span: >500 Cycles



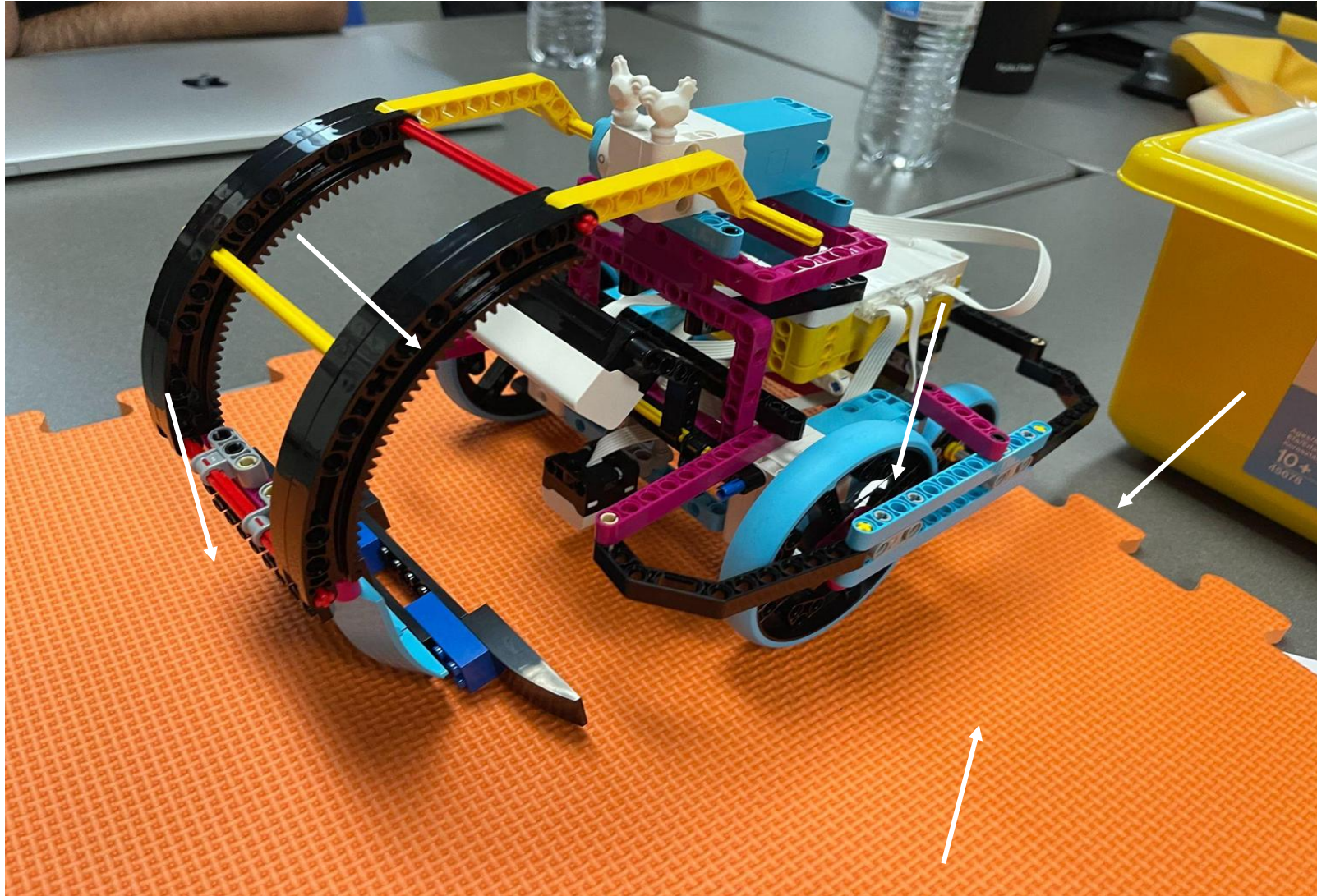
Prototype Testing Results

➤ Rock Retrieval and Mineral Identification: Conflicts

- distance sensor - failure to detect small rocks
- motor - failure to collect extra large boulder
- light sensor location - multiple out of bounds penalties
- Hub failure
- Software errors- new code malfunctioning

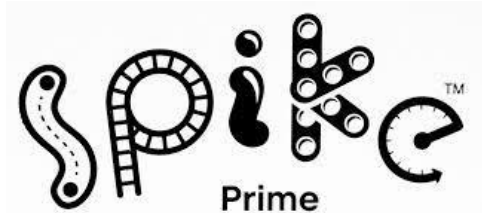


Prototype Testing Results



Control Program

- Navigation package
 - Manual block coding
 - Dual Motor System
 - Movement of the wheels and arm are done through motors
- Distance sensor
 - Determine the distance of our target payload and obstacles in order to activate the arm
- Communications package
 - Light Sensors
 - Determine any mineral deposits or danger zones to back up in



Important Takeaways

- Redundancy is necessary!
 - Alternate command sequences
 - Multiple sensors
 - Establishing possible planned and programmed paths
- Communication between multiple projects allows for the concept to flourish
- Take breaks, avoid burnout!
- Collaborating with others creates ideas and a supportive environment

Budget Management and Cost Justification



PARTS USED ROVER FINAL:	Price	Amt	Subtotal
A, Bushings, Pegs, Cross axles	\$1,000,000	47	\$47,000,000
B, Cross Axle Red, Yellow (s)	\$2,500,000	8	\$20,000,000
C, Cross Axle Yellow (L), Grey	\$5,000,000	7	\$35,000,000
D, T-Shaped Beam black/yellow	\$3,250,000	2	\$6,500,000
E, Beam white (s) 3m	\$3,250,000	3	\$9,750,000
F, 53/45 deg Angle Beam B & Y	\$5,500,000	9	\$49,500,000
G, Beam purple, blue, black	\$3,750,000	27	\$101,250,000
H, Technic Frame, purple, black	\$10,000,000	4	\$40,000,000
I, Cross Block Beam grey	\$5,000,000	11	\$55,000,000
J, Cross axle Expan. white/red	\$3,000,000	1	\$3,000,000
L, Cross Blocks and 1 w/2 holes	\$1,500,000	4	\$6,000,000
N, Bevel Gear	\$10,000,000	2	\$20,000,000
S, Wheel w/Cross Blk w/Blue	\$3,500,000	2	\$7,000,000
S, (small), wheel w/Cross Blk/B	\$1,500,000	2	\$3,000,000
U, Connector Beam purple	\$1,000,000	2	\$2,000,000
V, Hub, Yellow	\$15,000,000	1	\$15,000,000
X, Distance & Color Sensor	\$8,000,000	3	\$24,000,000
Y, Large Motor, Blue	\$10,000,000	2	\$20,000,000
BB, Rechargeable Battery, Y	\$3,000,000	1	\$3,000,000
CC, USB Cable, White	\$5,000,000	1	\$5,000,000
FF, Slope 2x6 Curved Blk	\$1,000,000	2	\$2,000,000
GG, Plate 2x8 w/Holes, Black	\$1,500,000	4	\$6,000,000
II, Brick 2x6 Blue	\$3,000,000	2	\$6,000,000
LL, Axle Connector & blush, Blk	\$3,500,000	2	\$7,000,000
MM, Wedges/windscreen, Blue	\$7,500,000	3	\$22,500,000
Total Final		152	\$515,500,000

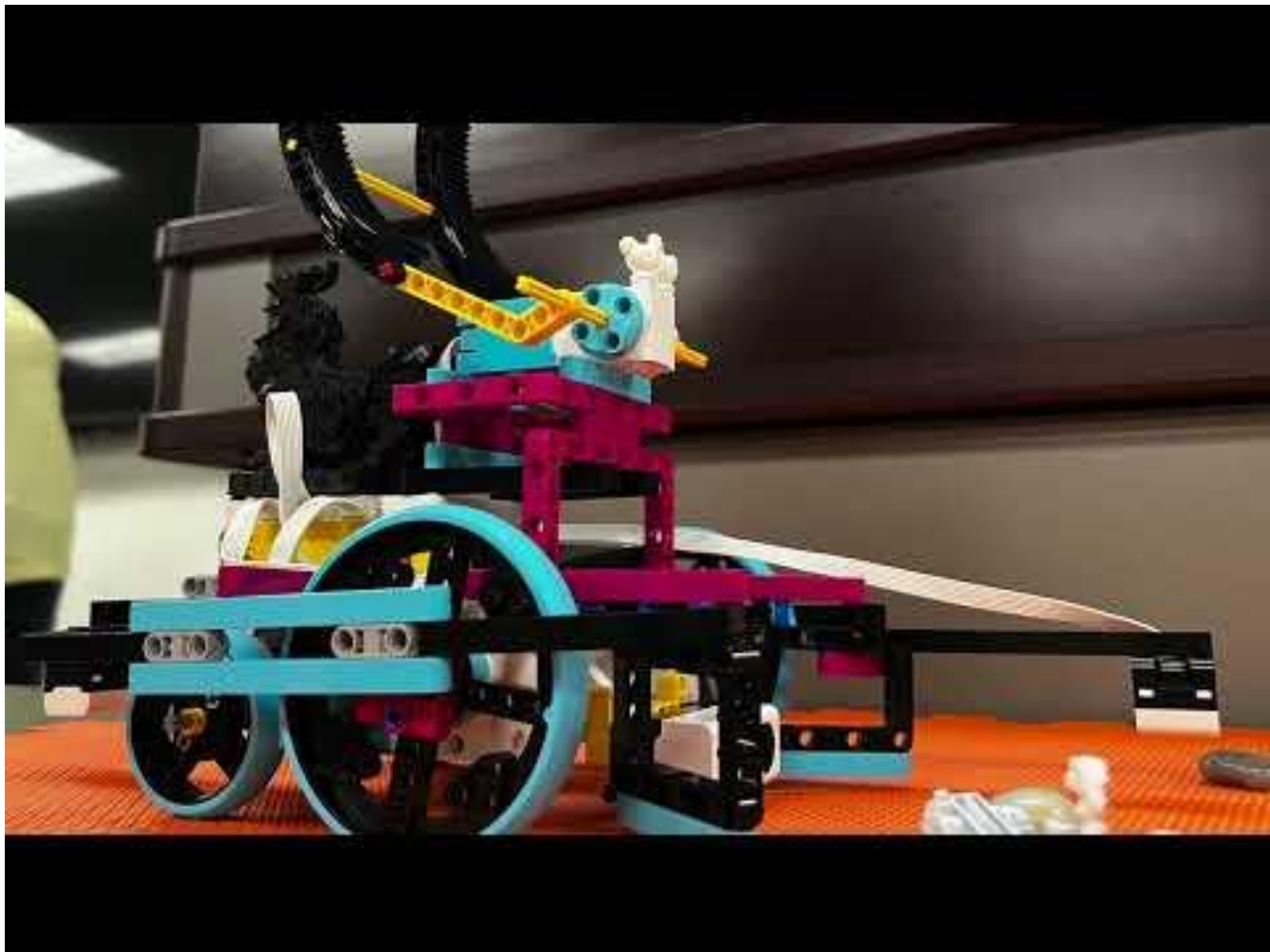
Starting Budget: \$600,000,000	Total Budget+Award: \$627,000,000
Budget leftover after Comp.1&2:	\$111,500,000
Rover Prototype Rock Retrieval and Mineral Identification Cost	competition 1: \$433 million spent for the rover \$4 million spent for renting/buying obj,tile,tape
Rover Prototype Rover/car Rescue and Mineral Identification Cost	competition 2: \$515,500,000 million spent for the rover \$2.6 million spent for renting/buying obj,tile,tape
Rock Retrieval and Mineral Identification Award Amount	competition 1: \$124 million won
Rover Rescue Award and Mineral Identification Award Amount	competition 2: \$469 million won
Total Bonuses	\$27 million (not including competition 1 & 2 awards) \$620 million (including competition 1 & 2 awards)
Total Fines	0 fines

- Budget Estimate:
 - Predicted to spend \$400 million for the rover, but ended up spending over the estimated amount
 - Predicted to receive \$15 million for reward bonuses and ended up receiving more than the estimated amount
- Rational for spending reasons:
 - A Sturdy Rover = more time for code, less worry if it breaks
 - Not enough money for competition 2 & improvements
 - Spend as much on the last competition to improve design and code

Thank You and Acknowledgments

- Special thank you to **Yanet G. Padilla**, M.S., **Ron Armale**, Ph.D., **Layal Lebdeh**, M.S., **Aaron Schwartz**, M.S., **Jesus Hoil**, B.S., and **Brinda Subramaniam**, Ph.D.
- Big Thank You To:
 - CSULB's Beach Launch Team, Automotive Dept. and Aero/Mechanical Dept.
 - Kira Erquiaga from the OC Water District
 - Chris Cervellone
 - Junnior Rodriguez
- AND Thank You to NASA for making this opportunity available for us.







Follow Us!

