Solar-Powered Rover

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Individual Engineering Analysis Assignments:

- Bowen Williamson and William Mancuso: MATLAB Simulink analysis of the state of charge of the battery, temperature vs efficiency of the solar panels, and solar radiation vs power generation for the solar panel
- Keldon Ngo: MATLAB Simulink analysis of the current draw of the rotational-motion motor
- Kenny Bui: MATLAB Simulink analysis of how the overall circuit is impacted by the additional load and the logic of the Arduino's code
- Margaret Burkes: MATLAB Simulink analysis of the current draw of the linear-motion motors

Individual Testing and Validation Tasks:

- Bowen Williamson: The battery runtime with the additional source of the solar panel in various conditions including full sun, partial sun, and no sun.
- William Mancuso: How the new additions affect the maneuverability/size of the rover. (Width, length, turn radius, weight.)
- Keldon Ngo: The power output of the solar panel in various conditions including full sun, partial sun, and no sun.
- Kenny Bui: Ensure the new addition of limit switches with the Arduino logic establishes a boundary that prevents the cleaning brush from moving beyond its desired distance. Activation of the brush cleaning system via Arduino is based on the environmental parameters of the rover at any given time.
- Margaret Burkes: The effectiveness of the brush in improving the energy output of the solar panel

Other Work Assignments:

- Bowen Williamson: Assemble the brush system and program/connect the charge controller
- William Mancuso: Fix the camera and breakers, assemble the solar panel and frame, and configure the pyranometer
- Keldon Ngo: Set up the motor driver and the rotational motor and design/manufacture the gantry plate
- Kenny Bui: Program the Arduino, build the linear actuator, and set up the limit switch
- Margaret Burkes: Set up the motor driver and the linear motor and create a website with a QR code

Gant Chart:

Manufacturing

Task	Start	End
Fix Rover Breaker	1/21/25	1/27/25
Coding Arduino	1/21/25	2/3/25
Design Gantry Plate	1/21/25	2/10/25
Make and Configure Website	1/21/25	2/24/25
Stepper Driver Configuration	1/28/25	2/3/25
Fix and Adjust Camera	1/28/25	2/3/25
Gear Driver Configuration	1/28/25	2/3/25
Construct Linear Actuator	1/28/25	2/10/25
Incorporate Limit Switches	1/28/25	2/10/25
Stepper Motor Wiring	2/4/25	2/10/25
Gear Motor Wiring	2/4/25	2/10/25
Pyranometer Platform	2/4/25	2/10/25
Program Charge Controller	2/11/25	2/17/25
Pyranometer Wiring	2/11/25	2/17/25
Connect Charge Controller	2/18/25	2/24/25
Assemble Solar Panel and Frame	2/18/25	3/2/25
Assemble Flange and Brush System	2/25/25	3/2/25

Testing

Task	Start	End
Solo Test Brush Cleaning System	3/3/25	3/16/25
Ensure Motors Actuate Properly	3/3/25	3/16/25
Solo Test Solar Panel Power Generation	3/17/25	3/30/25
Test Production In Different Scenarios	3/17/25	3/30/25
Solo Test Autonomous Power Switching	3/31/25	4/13/25
Test Power Switching with Different SOC	3/31/25	4/13/25
Test Rover With Total Integration	4/14/25	4/20/25
Make Adjustments as Needed	4/14/25	4/20/25
Series of Final Tests	4/21/25	4/27/25