

Renewable Vehicular Robot

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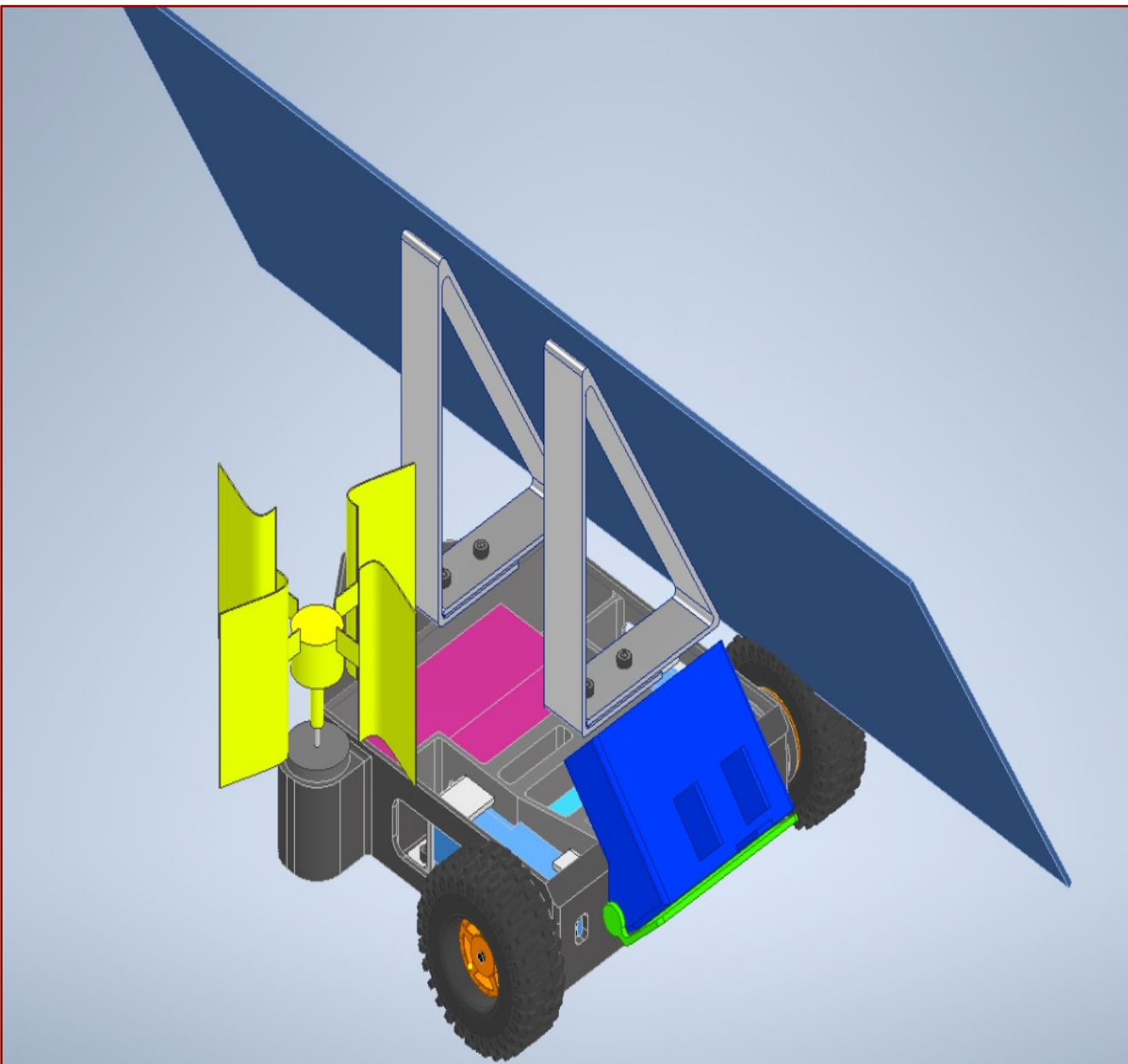
Introduction

One way to increase renewable energy production is by developing devices that can charge directly from the sun and the wind without drawing power from the grid. If enough devices are developed with this capability, it will reduce the strain on the power grid and alleviate reliance on non-renewable resources.

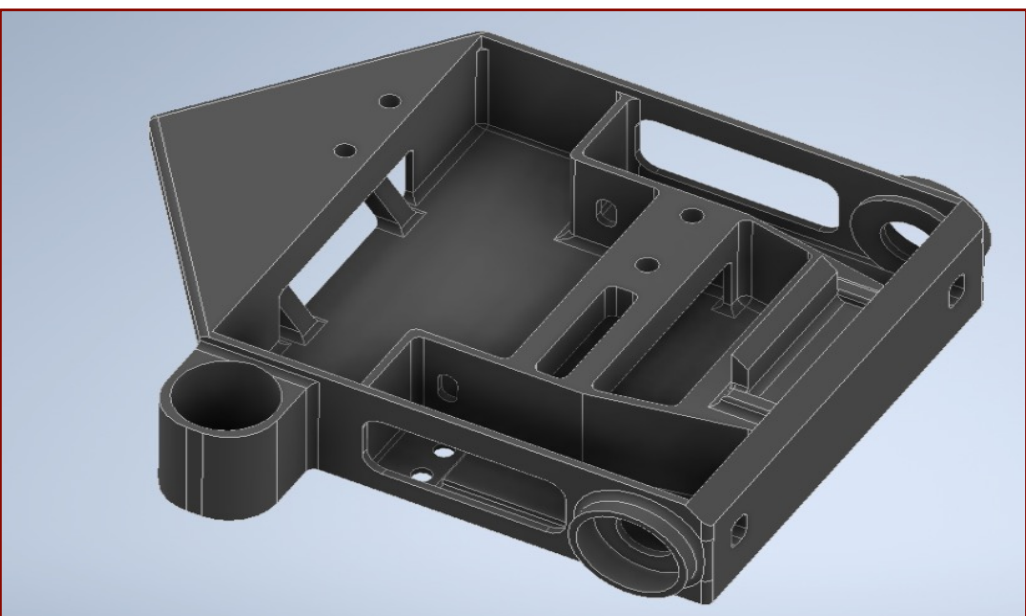
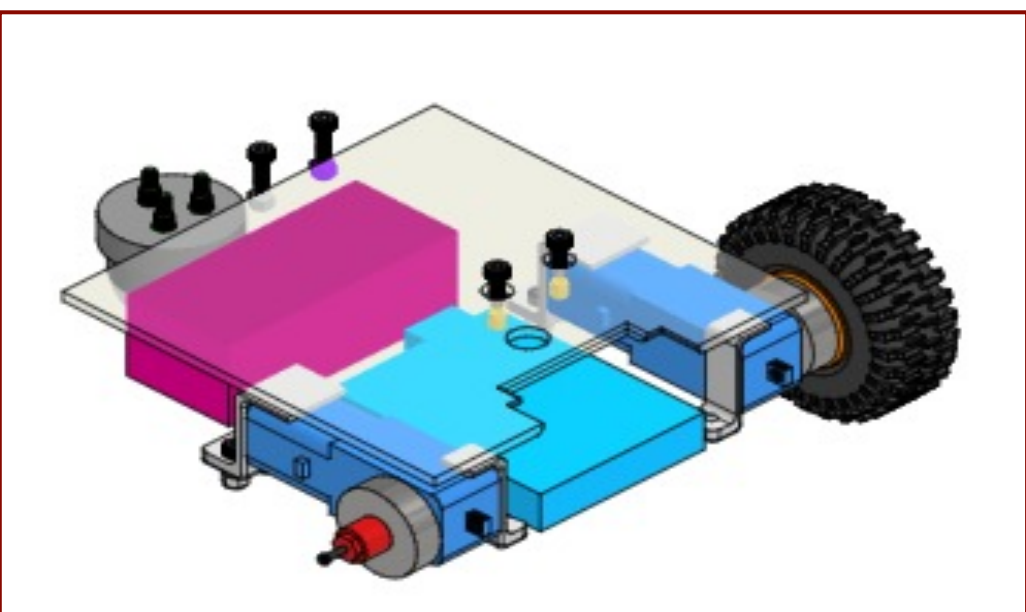
Mission Statement

To develop technology for renewable energy devices by designing a Renewable Vehicular Robot (RVR) for use in the ASME Student Design Competition.

Design

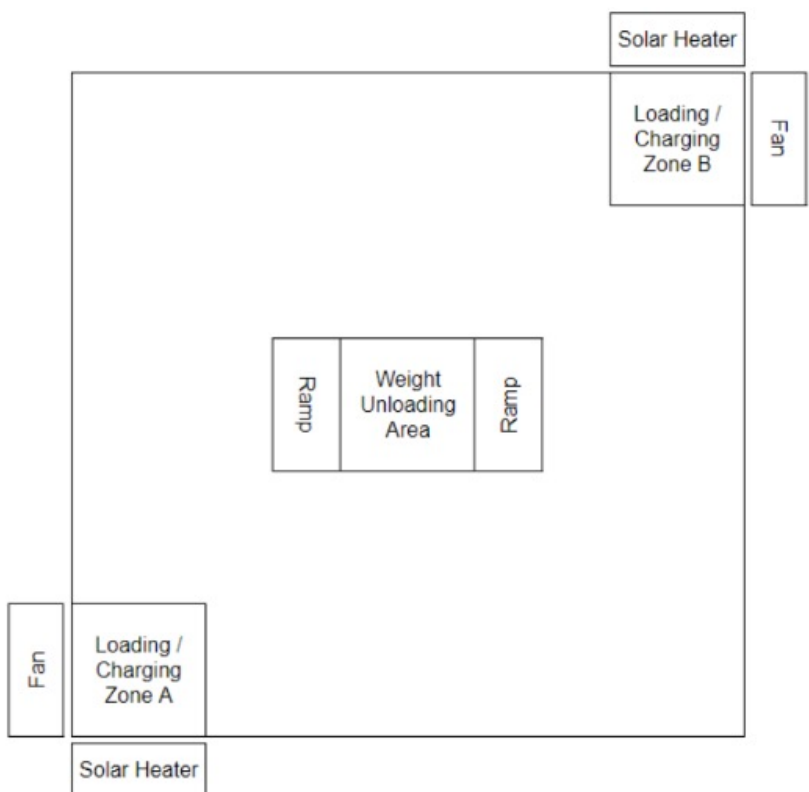


Full assembly

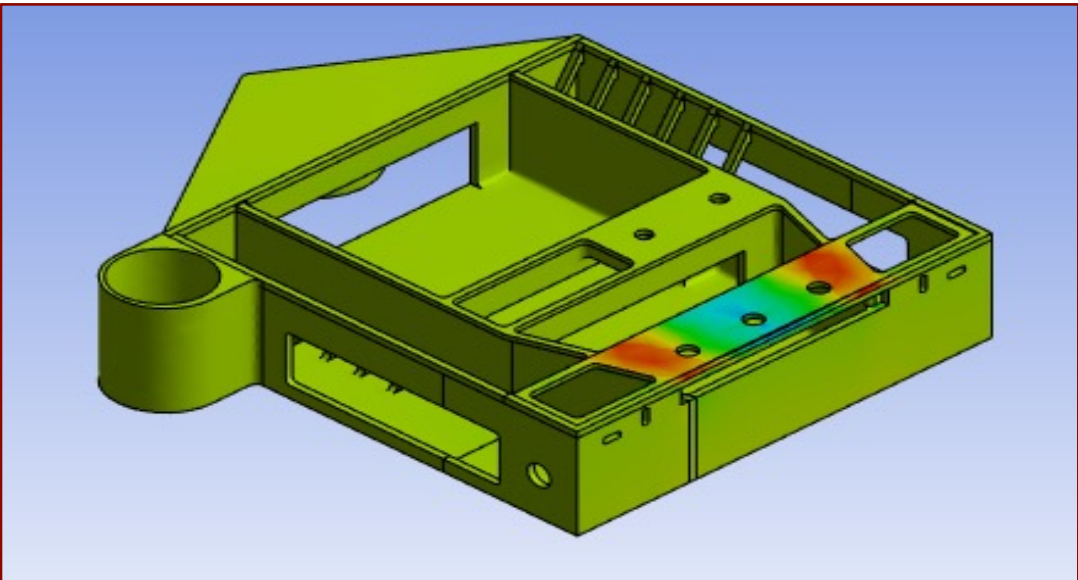
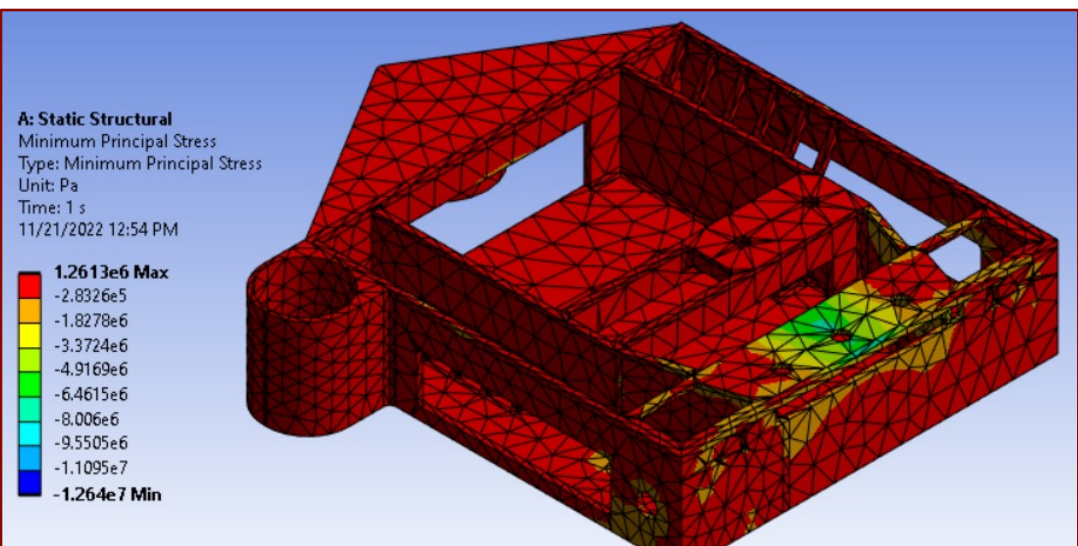


Main body assembly

Competition Rules



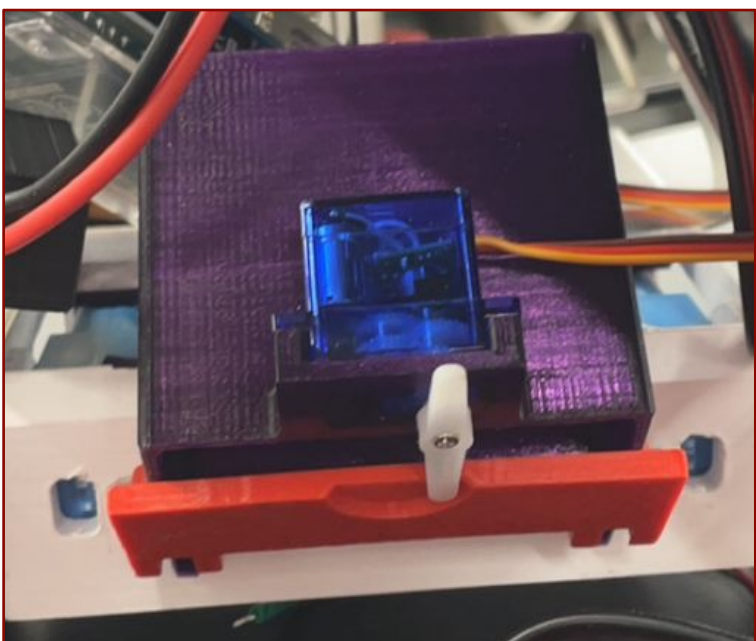
Testing



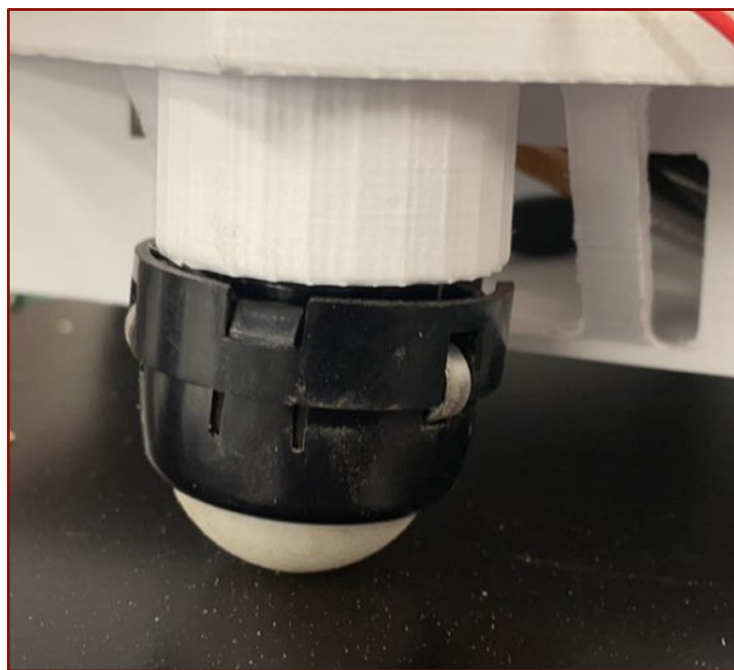
Principal stress of 1.26MPa and 0.8MPa for loaded and unloaded, respectively. The body has a safety factor of 5.19 and 7.77 for loaded and unloaded, respectively.

Manufacturing

Most of the parts were manufactured by 3D printing PLA because of the complexity of the design and size of the vehicle. Solar supports were made using sheet metal which was bent, and threaded inserts were press fit for all attachments. All other supporting part was purchased and assembled to body. The vehicle is remote controlled, and codes were done with Arduino.



Unloading mechanism



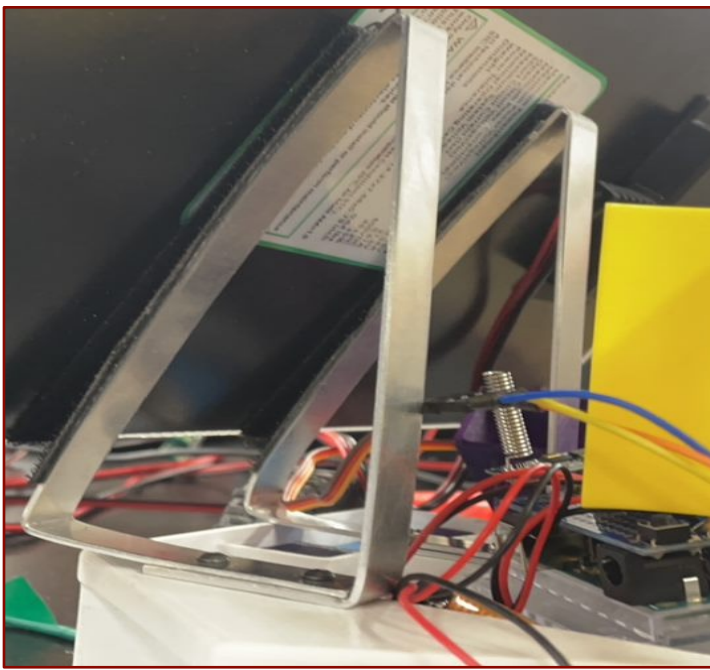
Back swivel wheel



Remote control



Motor with motor tabs



Solar support

