MARVIN

JPL Open Source Rover

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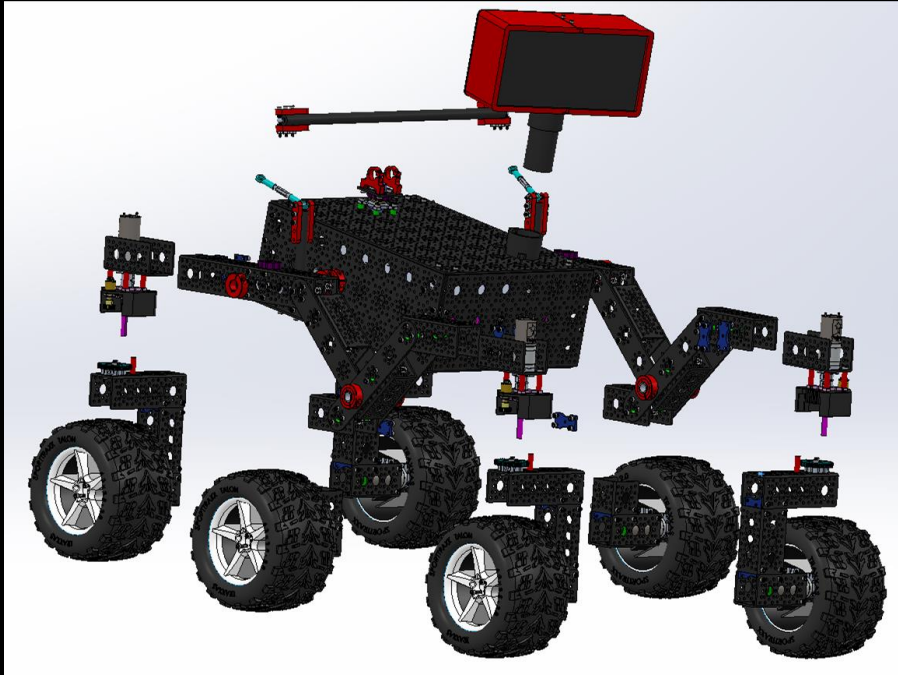Salvador Cortes Soancatl, Darius Animo

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MARVIN is a 1:9 scale Curiosity rover educational kit, based off open sourced design created by NASA JPL. Our goal was to update and improve the guide for space enthusiasts of all ages. This kit demonstrates the processes used to manufacture the rovers currently exploring the surface of Mars and spark improvements for future rover designs.
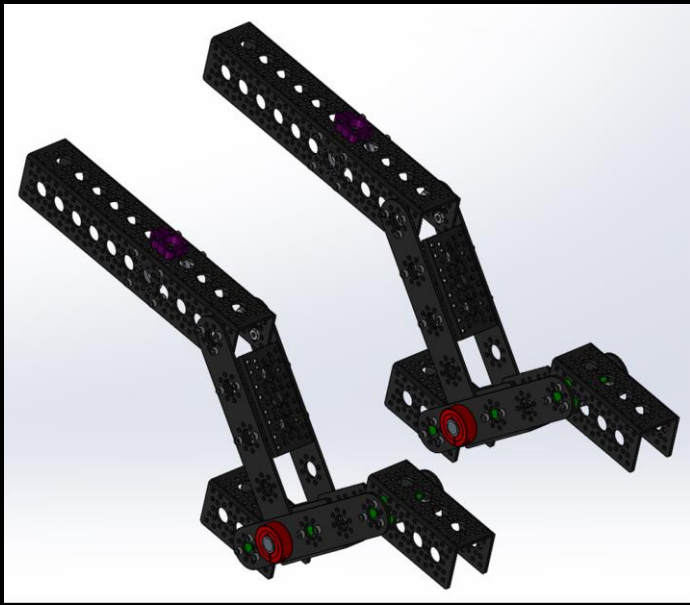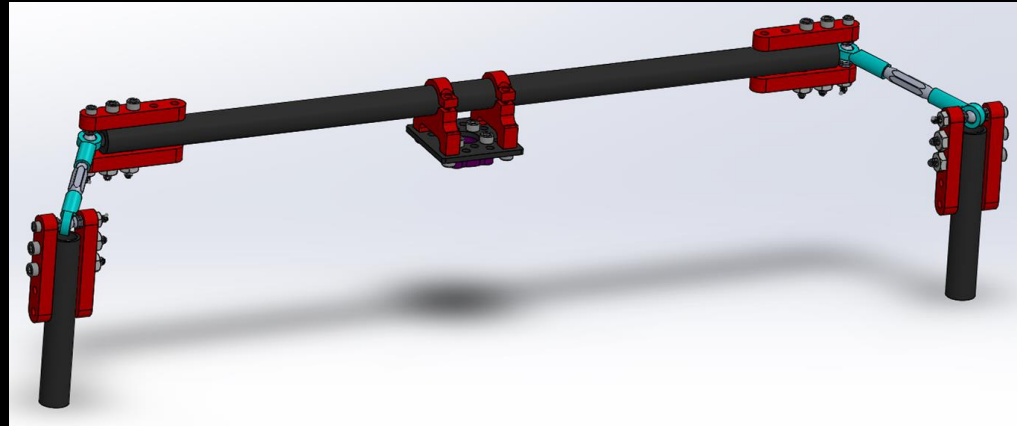
Rocker-Bogie

The design increases traction by having all six wheels in contact with the ground.
Modular link lengths allow customizable length of the rover.
Able to climb obstacles up to 2 times the height of the wheels

Differential Pivot

Balancing system that offloads the weight from one side of the rover to the other when the wheels hit obstacles.
Connects the Rocker-Bogie to the body.

Wheels

The wheel assembly attaches updated wheels with prototype connectors to the rover legs, holding the motors that connect to the Rocker-Bogie suspension for full range movement of the rover.
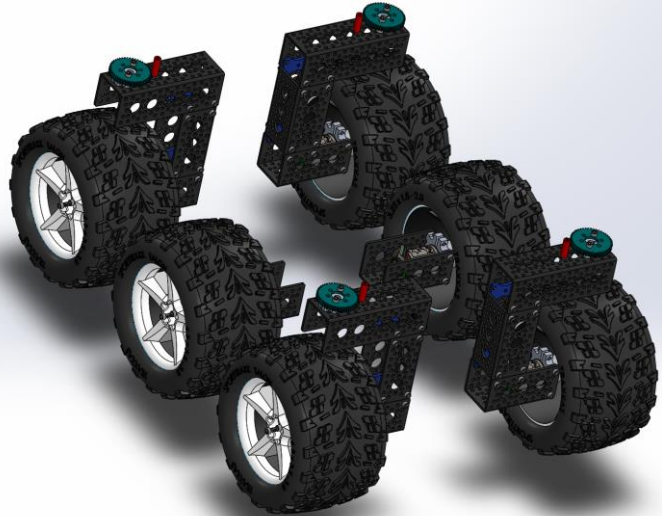

Head

The head is the enclosure for the camera and future additional sensors. 3D printed components make it very modular with easy access to interval modules.
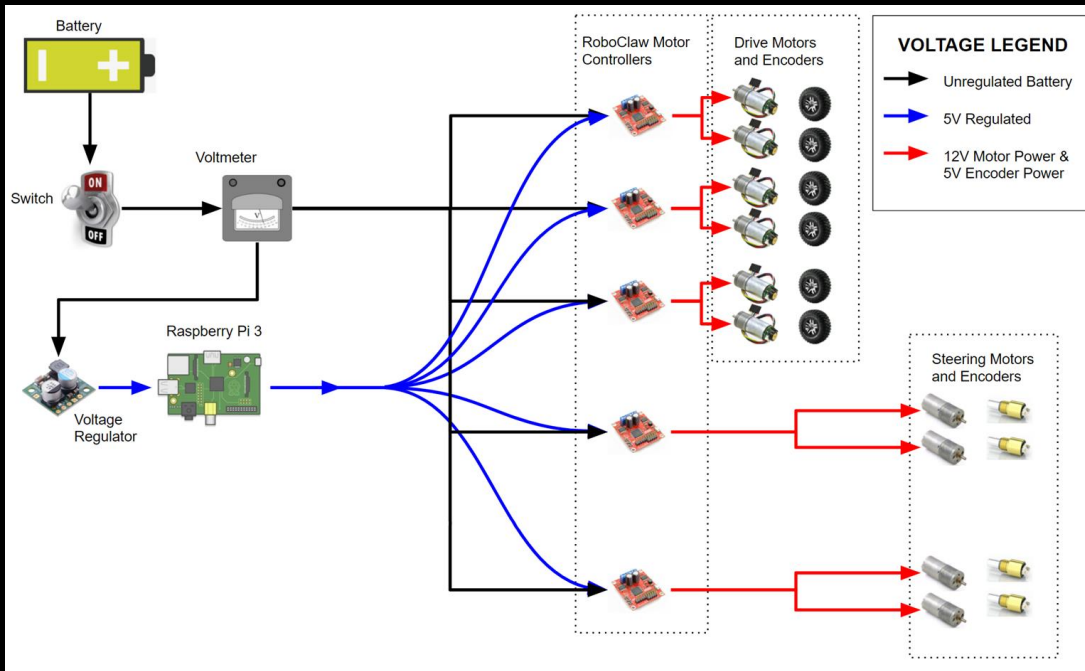
Power Distribution

12V battery powers the motors and encoders. An additional 3.7V LiPo battery is onboard charged by the solar array. This battery is used for backup power for microcontroller and onboard sensors.
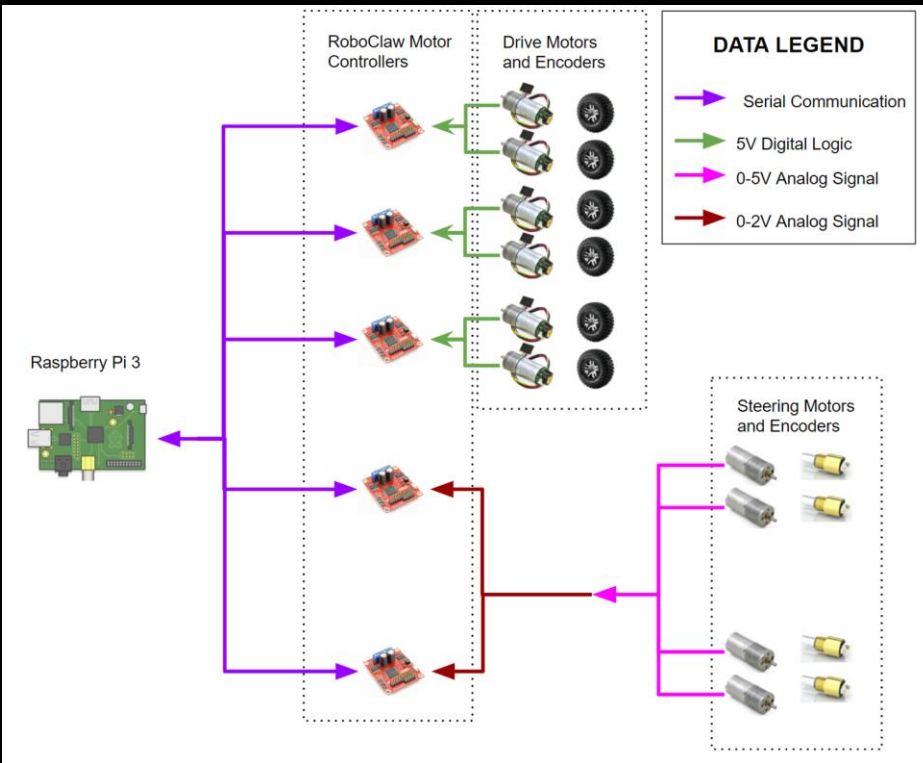
Data Distribution

Payload is managed by an MSP432, sampling and processing data before transmitting to the Pi. This rovides an extremely flexible platform for managing analog and digital inputs.

The Raspberry Pi acts as the core processor of our system, managing motor control, wireless communication, and video processing.