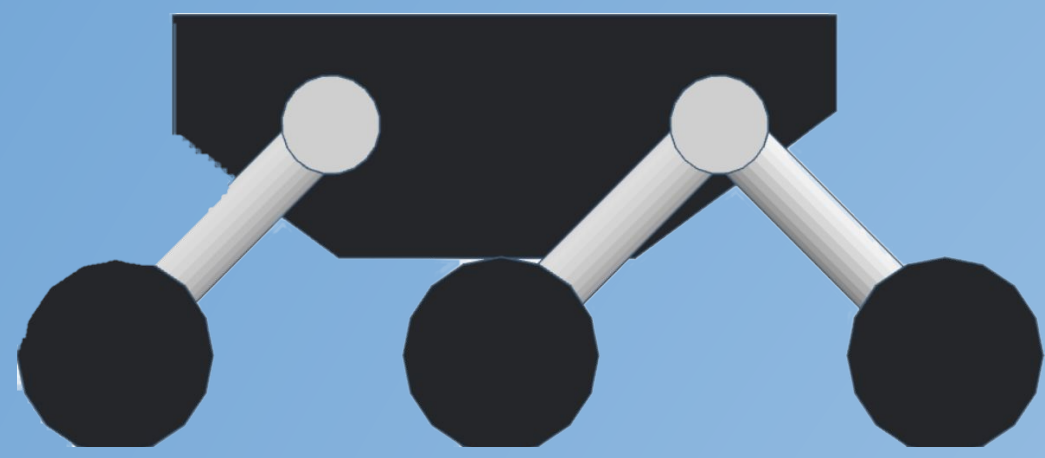
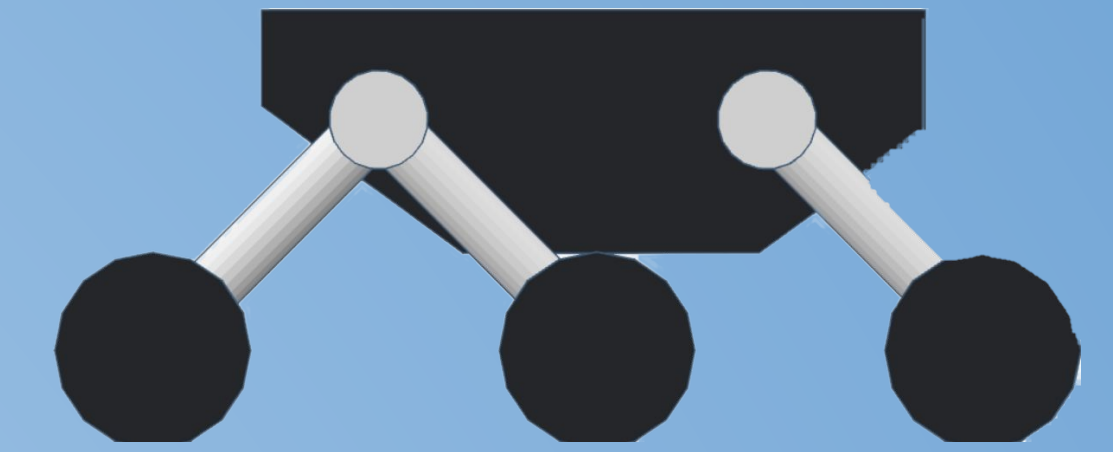
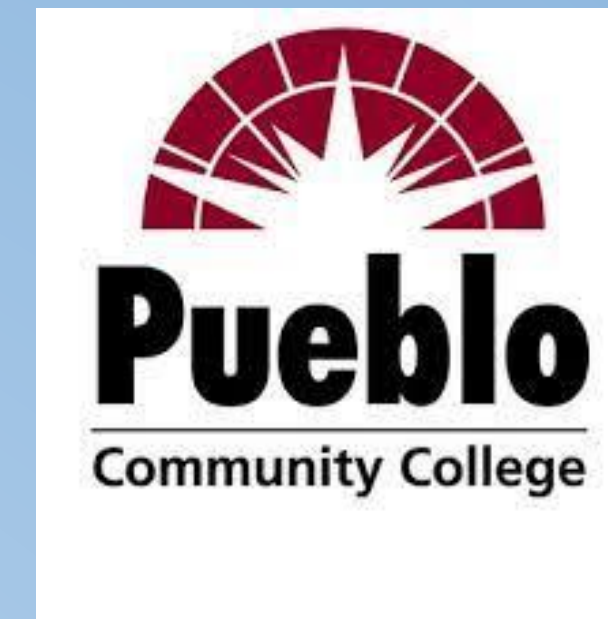




ERROR 404

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Abstract!

With the increasing interest in exploring different planets, there is also a need to gather data and collect information about the planets. Currently one of the most famous methods for achieving this goal is the Mars rover. A lot of planning, engineering and time went into the creation of the Mars rover. As Engineering students our team *Error-404* has decided to explore just how challenging creating an autonomous rover is, as well as coming up with interesting ways to maneuver around uncertain Terrain. We designed the rover with the intention of being able to scale tall objects nearly double it's height. To accomplish this we designed the Rover with 6 wheels, the rear 2 being fixed rigidly to the body, and the front 4 wheels attached to the body by a servo. This servo motor will rotate the 4 wheels above the rover with the assistance of the driving wheels. Physically building and programming a rover opens opportunities to spark new ideas and innovative ways to create these roaming robots. The entire process engineering a rover from the ground up has already generated new ideas and recognize points of failure in our own rover. Primarily using tinkerCAD as the 3d cad program, and coding, the rover has a simple design but can have a variety of applications and modifications, that can be applied to other rovers and robots.

Who Are We?

We are team ERROR 404 which consist of team lead Luciano Varos and Joseph Flores. Our rover, "Dr. Dune" is a 6-legged autonomous rover design to handle various terrains no matter the weather. Its unique "see-through" look was designed to give the audience a glimpse inside the inner workings of the rover.

You've got questions, We've got answers!

◆ What's the reasoning behind the 6 legs?

The more contact to the ground, the better! The rover is design to have as much traction to the surface as possible. The inspiration for the design came about after examining the Mars Curiosity Rover.

◆ What was the reasoning behind the design of the wheels?

The idea of the wheels is to "claw" its way through different terrains. The wheels have a diameter of 3" and width of 2.5".

◆ What's the distance the sensors can detect an object?

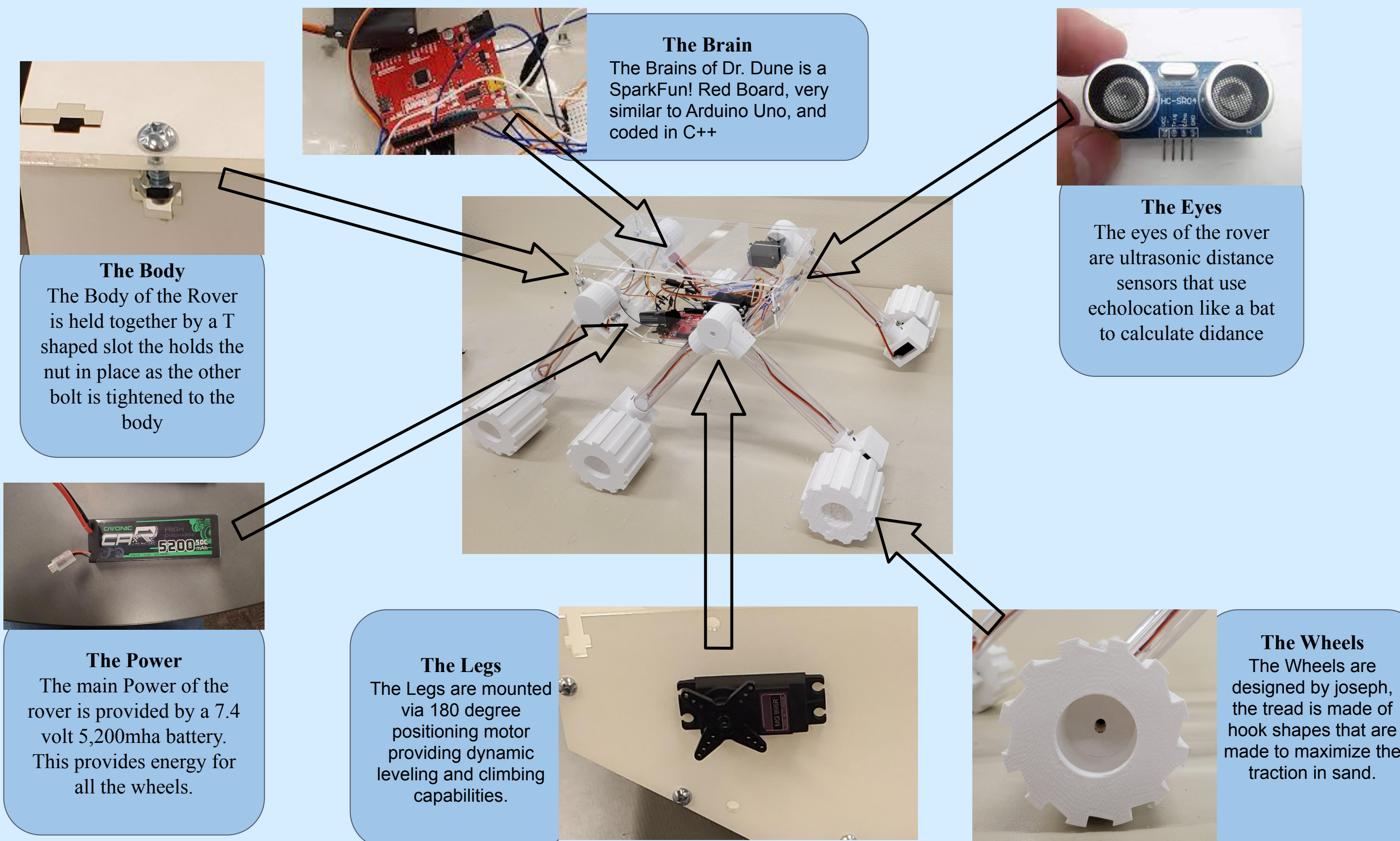
The Sensors have the capacity to sense distances over 10 feet! but in practice it is most effective within a 3 foot range.

◆ What are the dimensions of the rover?

- ◆ 10" in total height
- ◆ 23.5" in length (side view)
- ◆ 17" wide (front view)
- ◆ Has a clearance of 5.5"

Its safe to assume that Dr. Dune has been eating its Wheaties!

Meet DR. DUNE!



What Am I Made Of?

- 1/8-inch acrylic panel sheets
- ½- inch clear PVC pipe
- Wires
- 6 open loop servo motors
- 2 closed loop servo motors
- More Wires
- 1 breadboard
- 1 Arduino
- 1 ultrasonic sensor
- Battery
- And a dash of love of course!

Conclusion

The Process of Building your very own Rover is a great experience anyone should get to try in any field. Many lessons can be learned about leadership, time management, goal setting and goal reaching, and many more can be learned along the way. Designing and testing the rover is a great hands on project that gives you great experience for learning the engineering design process. We also learned how to use new tools and programs, such as soldering and a simple 3D CAD program. All the data collection and experience we gained can be applied to many other projects in the engineering community, maybe even on the Mars Rover itself!

Special Thanks!

We would like to thank everyone that supported us throughout our journey including the PCC STEM center and everyone in it for providing us with a space and tools we needed to pull this off. A special thanks to the head of our STEM Department Joey Mathews for introducing us to such a great opportunity for us.