

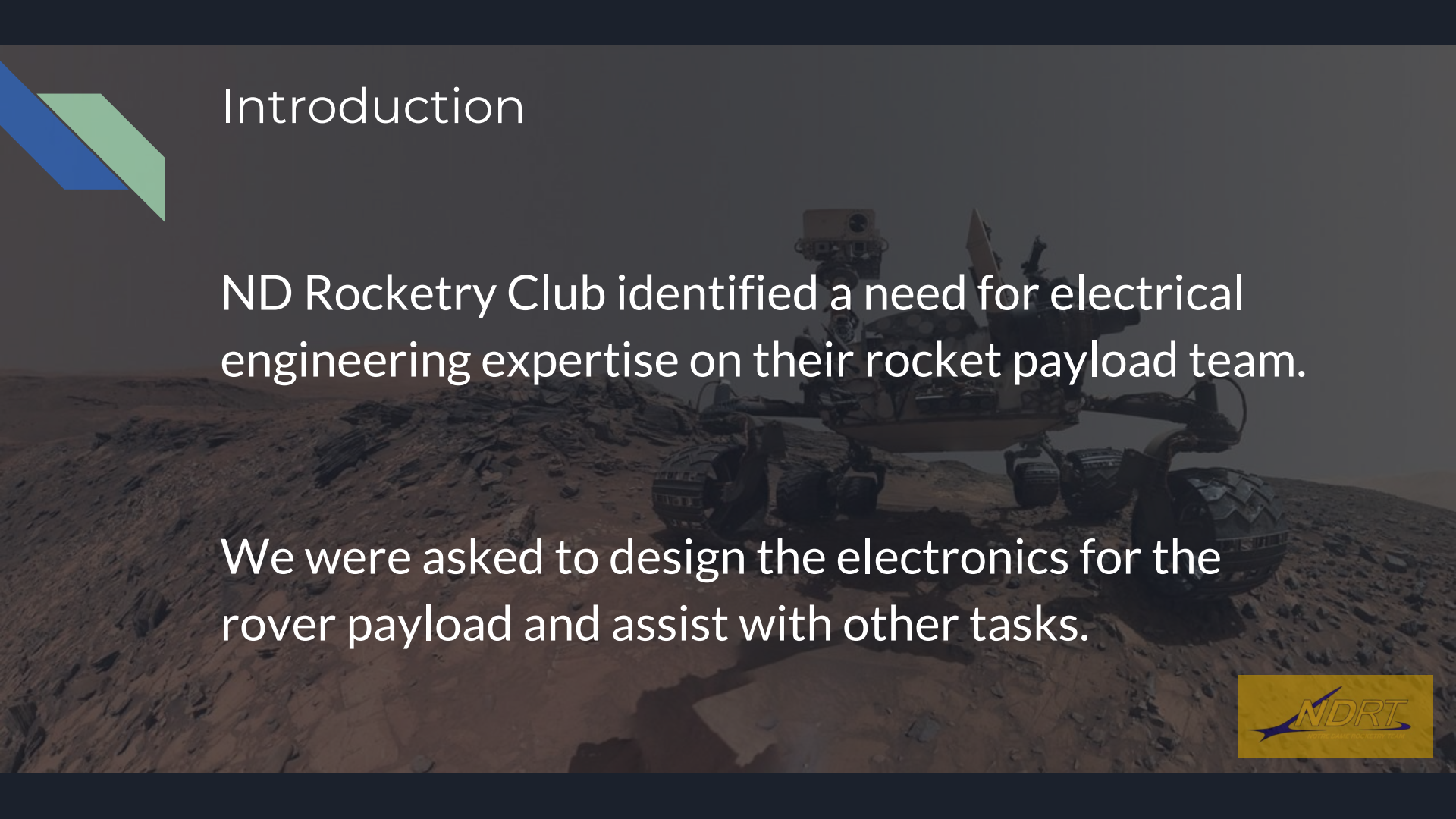


Deployable Rover

Kevin Yokum, John Speier, Christopher St. George, Vinolin Anbalagan



Introduction



ND Rocketry Club identified a need for electrical engineering expertise on their rocket payload team.

We were asked to design the electronics for the rover payload and assist with other tasks.





Problem Description

4.5.1. Teams will design a custom rover that will deploy from the internal structure of the launch vehicle.

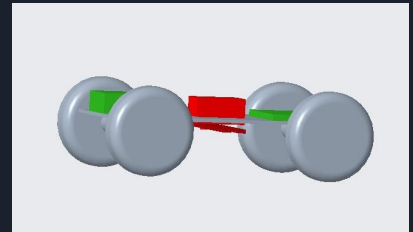
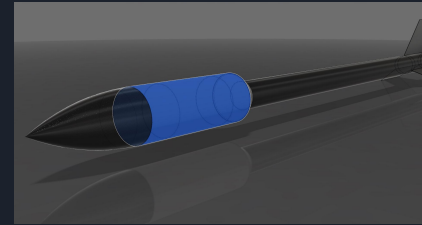
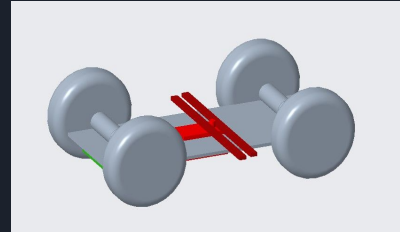
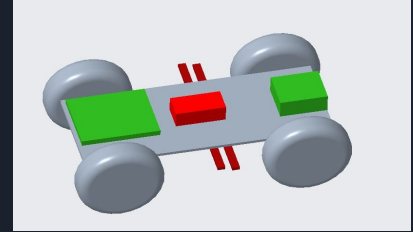
4.5.2. At landing, the team will remotely activate a trigger to deploy the rover from the rocket.

4.5.3. After deployment, the rover will autonomously move at least 5 ft. (in any direction) from the launch vehicle.

4.5.4. Once the rover has reached its final destination, it will deploy a set of foldable solar cell panels.

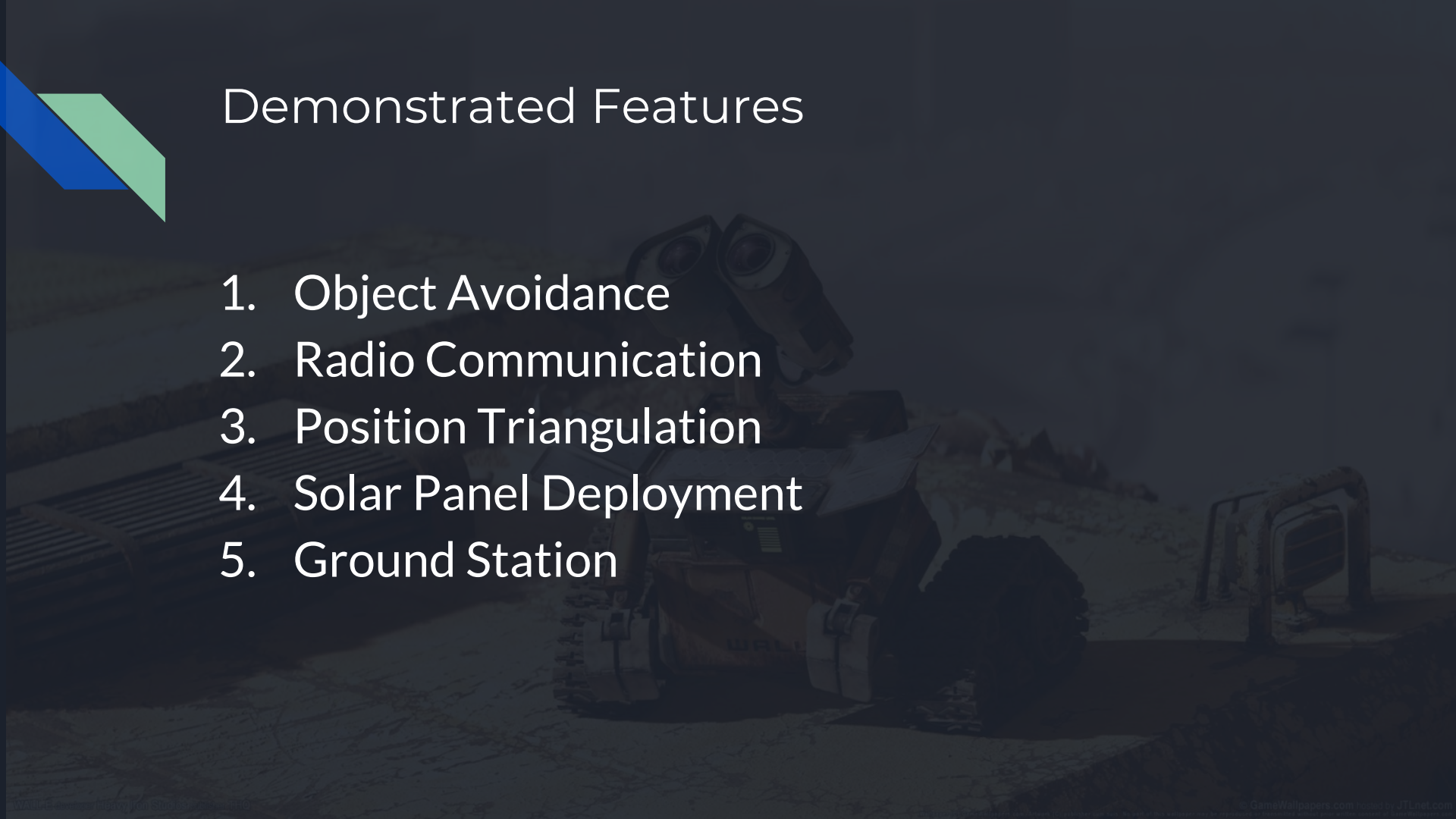
Proposed Solution

1. Rover Ejection
2. Rover Deployment
3. Rover Movement
4. Solar Cell Deployment





Demonstrated Features

1. Object Avoidance
 2. Radio Communication
 3. Position Triangulation
 4. Solar Panel Deployment
 5. Ground Station
- 



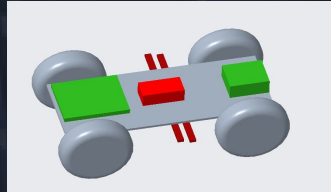
Available Technologies

1. PIC32 Microcontroller
 - a. LiDAR Sensor
 - b. Gyroscope and Accelerometer
 - c. Altimeter
 - d. Bluetooth
 - e. Radio Communication [LoRa Modem Network]
2. Power Control System
3. Base Station

Engineering Content

Bluetooth
Beacon

Base
Station



Mobility and
object
avoidance

Solar Panel
Deployment
Mechanism



Conclusions

- Cost and Budget Justification
- Cross-function and Interdisciplinary Team Experience
- NASA!

