UPRA Swarmathon Team 2019
NASA Swarmathon 2019: Mission to Mars
April 30th, 2019

Mission Report

Mission Objectives:

- Set out the Swarmies on an expedition to explore the surface of Mars and safely return to base while collecting samples along the way in preparation for more complex missions.
- Test the efficiency of the Swarmies by running them inside a virtual simulation on uneven and challenging terrain in order to make optimizations to the programming where necessary.

Observations:

- The Swarmies were able to operate normally in the simulation environment.
- Swarmies were able to traverse on top our custom 3D meshes with no problems.
- Samples were able to be picked up by the Swarmies.
- The Swarmies had a bit of trouble grabbing the samples with their claw.
- Samples collected were successfully delivered to the collection pad.
- The Swarmies were able to detect obstacles and avoid them.
- The Swarmies were able to detect other robots and avoid them.
- Swarmies are seen expanding their area of search further away from the center as the mission progresses.
- After traversing a decent amount of distance, the Swarmies were able to make their way back to the center.
- Swarmies are observed to detect steep slopes and avoid climbing them.

Analysis and Conclusions:

- Our mission was carried out successfully, the Swarmies were able to collect samples on our world and bring them back to the base. There were times where the robots struggled to gather the samples and we believe this is due to the uneven terrain. The Swarmies were programmed to be operated under controlled conditions for the main competition. The variability of the terrain our team built allowed us to test the efficiency of the hardware and software of the robots. The success of our mission will allow us to tackle bigger and more ambitious projects in the future.

YouTube Video Link: https://youtu.be/4JxGaHy9EEQ