

1. Image Capture Test

- a. Objective
Generate a composite image from several images taken at different angles
- b. Location
Football Field / Park / Cliff edge
- c. Setup
 - Place camera oriented towards open area with unobstructed view
 - Place markers in 5 degree arc, approximately 10m from camera
 - Markers have pattern to determine pixels per square inch
- d. Equipment
 - RealSense Camera, PhantomX Pan Tilt, AprilTag Markers
- e. Steps
 - Run vantage point code
 - Camera aligns to first marker
 - Camera takes images
 - Repeat for all markers
- f. Success Criteria
 - Save at least 3 images captured at different angles in a local directory on the rover computer
 - Also, save the data of the pan-tilt angles corresponding to the images
 - The camera should center on the markers placed along an arc (each marker should fall approximately at the center of an image)

2. Brinkmanship Test

- a. Objective
Detect the presence of cliff edge near the robot
- b. Location
Gascola
- c. Setup
 - Place rover facing cliff edge, several feet away
 - Attach rope to rover for safety
- d. Equipment
 - "Blue" rover, RealSense camera, rope
- e. Steps
 - Run brinkmanship code
 - Rover begins to drive towards cliff edge
 - Rover stops moving when edge is detected
 - Code logs time-stamped report of edge detection
- f. Success Criteria
 - Rover stops within 0.5 seconds of edge identification
 - Rover stops within 0.25 meters of cliff edge
 - Rover meets above criteria on 5 successive tests

3. Simulation Test

- a. Objective
 - Plan global and local paths through simulated terrain, and execute the planned motion
- b. Location

- WeBots simulation
- c. Setup
 - Initialize simulation with rover surrogate and lunar terrain (including pit)
 - Set waypoints around pit
- d. Equipment
 - Simulation computer
- e. Steps
 - Run simulation
 - Rover navigates route to waypoints defined by global plan
- f. Success Criteria
 - Travel time less than 150% of Human-teleop time
 - Locally navigate until 1 meter from the edge of the pit
 - End navigation a full robot length away from the center of the waypoint