Spring Validation Demonstration

Team C - Lunar Autonomous Regolith Excavator [LunAR-X]

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Objective: Demonstrate electro-mechanical system building a berm with tele-operated control.
Elements: Mechanical, Electronics, Localization Subsystems
Location: Planetary Robotics Lab - Moonyard
Equipment:
1. Lifting mechanism with attached drum
2. VN-100 IMU
3. Total Station
4. RealSense 435 Cameras x 2
5. Husky A200
6. Electronics setup
7. Control Station

Procedure:
1. Attach the lifting mechanism, electronics, IMU, total station receiver, and RealSense cameras on the Husky
2. Set up tele-operated control over all actuators
3. Place the robot in the Moonyard
4. Operate all actuators by moving the husky in fixed patterns, lifting and lowering the lifting mechanism, excavating and dumping using the drum
5. Press the emergency stop while moving
6. Record a bag file when moving the robot in a closed loop
7. Record a bag file of the camera data while moving the robot around a build berm
8. Execute multiple cycles of excavation and dumping to build a berm

Verification Criteria:
1. The system is able to build a berm using tele-operated control
2. Emergency stop button stops all actuation without affecting the computing subsystem
3. Initial and final poses from the localization module are within 20 cm in the loop closure test
4. Pointcloud built using camera data accurately represents the berm