Robotic Mining Competition - CS Requirements
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Client: Robotic Mining Competition team, NASA
Meeting Times: Wednesdays, 4:00pm - 5:00pm; Fridays, 3:00pm - 3:30pm

Functional Requirements

Number	Requirement	Correct Input/Output	Incorrect Input/Output
1	The system shall have software that enables a user to manually move the robot straight forward and backward, as well as turn left and right given input from a controller.	Input: Button to move forward is pushed. Output: The robot moves forward.	Input: Button to move forward is pushed. Output: The robot moves backwards instead, or not at all.
2	The system shall have software that enables the robot to automatically move forward and backward, as well as turn left and right, on its own, given set navigation points.	No user input.	The robot does not move at all, or it does not move in the correct directions based on given navigation points.
3	The system shall have functions that allow the robot to navigate a given course, given information about waypoints it must travel to.	Input: Data from the waypoints about their positions. Output: The positions are correctly displayed on a graphical interface.	Input: Data from the waypoints about their positions. Output: Waypoint positions do not display, or mark incorrect locations.
4	The system shall have software that allows a user to manually excavate and dump lunar material with the robot.	Input: Button to dig is pushed. Output: Robot begins digging and keeps digging as long as button is pushed, or a point is reached where a certain amount is collected. Then it stops.	Input: Button to dig is pushed. Output: Robot does not start digging, or stops before button is released and the max amount collected has been reached.
5	The system shall have software that allows the robot to automatically	Single button press and it digs itself until full; OR, starts digging only when it reaches waypoint set as	Output: Robot does not start digging, or stops before the max amount

		the digging zone, stops when full.	collected has been reached.
	excavate and dump lunar material.		
6	The system shall be immediately shut down when a kill switch is pressed.	Button is bushed, power is cut.	Button is pushed and things continue to operate.

Interface Requirements

Number	Requirement	Correct Input/Output	Incorrect Input/Output
1	There shall be an interface for tracking the location of the robot.	An interface with an area for waypoint locations and robot location appears on a screen. A separate box with distances to certain. Waypoints should be available.	An interface does not appear or the area for locations does not appear/look right. The box containing waypoint distances is missing entirely or partially.
2	The interface shall show the current location of the robot.	The point marking the location of the robot is central to the area for showing locations.	The point marking the location of the robot does not appear or moves around.
3	The interface shall show the positions of the waypoints that the robot must navigate to. These waypoints will be set up beforehand.	Graphic interface correctly showing the locations of navigation waypoints. Points are. Adjusted depending on distance to robot.	Graphic interface does not provide correct locations or has missing locations, or points do not move when robot moves.

Performance Requirements

Number	Requirement	Correct Input/Output	Incorrect Input/Output
1	The system shall use a minimal amount of bandwidth to detract as little points from the overall design as possible.	1 construction point is lost for every 50 kb/s of bandwidth used, so the least amount we can use is the best output.	---
2	The situational awareness camera, if one is implemented, shall not exceed a bandwidth of 200 kb/s.	No camera/1 camera, and less than 200 kb/s of bandwidth used.	More than 1 camera, more than 200 kb/s being used.