

Description

The interface was modified to check the infrared distance sensor, also known as the Light Bumper. Next, two functions were created within the read file. The first has the robot follow parallel to the wall. The other function is used by the wall as a PD Controller to correct any errors that occur. We first took the square root of the signal strength from the light bumpers, this made the numbers easier to work with. We also decided to primarily use the right light bumper because the sensors on the robot are not perfectly symmetrical. The right bumper was on the middle of the side of the robot whereas the left one was further up. To select the set point and the gains we first took measurements from the sensors. The value that was close to the obstacle but far enough away so that the robot would not hit the wall when it turns. When finding our Kp value we used trial and error. We tried to choose a value that had the least oscillation when following the wall. We did something similar with the Kd value, choosing the value that makes the robot's path look the smoothest.

Evaluation

Yes, the robot functions properly and follows the wall with minor oscillating. When the robot reaches the end of the wall it rotates and continues down the opposite side. If the wood wall is moved away from the robot, it will move back closer to the wall. The robot functions and performs everything specified in the assignment. We would recommend using a PID control when doing similar tasks. When you use a PID controller you can almost guarantee a straight drive in comparison to using objects. The PID controller also performs well when mapping an environment because you want to receive proper outlines before mapping the inside. You also have more control over the motion of the robot. For example, by changing the values you could have the robot oscillate more or move in a smoother line.

Allocation

Franco Godoy corrected mistakes on task 1, worked on task 2.

Jeffrey Knoll also corrected mistakes on task 1, worked on task 2.

Kaitlyn Ash worked on task 1, helped with task 2 and wrote the report.

Noah Wartzack worked on task 2, wrote the readme and helped with the report.