Andrew Tarnoff

Mobile Robot Programming Problem Set #2

CODE LINK:
https://github.com/art81/EECS373/tree/master/MobileRobotics/mobile_PS2/lidar_alarm/src
Then click on "lidar_alarm.cpp"

Theory of Operation:

The main purpose of the lidar_alarm node is to be able to return true if it is unsafe for the robot to move forward and false if it is safe for the robot to move forward. In order to accomplish this, I wrote a method called "isCorridorBlocked" that takes in the laser_scan (info from the lidar), and a virtual rectangle width and height (in meters) and returns true or false based on the information previously described. Essentially, my program draws a virtual rectangle around the robot looking like the picture drawn below with height and width passed to the function. Then, for every single lidar ping starting from the one pointing directly right to the one pointing directly left, my program uses the angle of the current ping to determine the distance from the center of the robot to the rectangle. Given this distance for all pings if, for any ping, the ping length is shorter than the rectangle distance for that ping's angle then we know that it is unsafe for the robot to move forward and the program will return true. This is because if the distance is shorter then that means there is something inside of the rectangle which means the robot will hit it if it continues to move forward.