

GEAR/TCEA Robotics

Challenge 3: Stay in Touch



Challenge 3.2: Bump and Explore

THE OBJECT:

This part of the challenge aims at learning how to make the robot stay in touch with its environment using the touch sensor by programming it to move autonomously through a room or obstacle course. At the end of this challenge, the robot is expected to be able to move autonomously through a room or an obstacle course by "feel" using its touch sensor input.

The object for this part of the challenge is to design and build a forward-facing touch sensor attachment for your robot and make the robot react on touch sensor input.

CHALLENGE TASKS:

1. Add a forward-facing touch sensor to the front of your robot. Make it point forward and attach it to the robot such that it cannot be rotated up/down. Ensure that the input end of the sensor is the leading element of your robot when moving forward, so if it were to hit a wall or other object, the sensor input would be bumped. Try to do this task WITHOUT referring to any manual or other printed instructions.

2. Connect the touch sensor with the brick using a connection wire. Which port did you choose? Make a note below to refer to later.

3. Create a program that moves the robot forward until the robot's touch sensor hits an obstacle and then stops moving forward. Test your program. Make sure that your program works correctly regardless of how far the robot is away from the obstacle when it starts.

4. Build on to your program in such a way that once the robot hits an obstacle and stops, it then backs up three inches in the opposite direction of the obstacle.

5. Expand your program such that the robot is able to autonomously move through an obstacle course, i.e. the robot moves forward until it hits an obstacle with its touch sensor then backs up three inches, and then turns and goes forward again. Try using a loop in the programming such that the robot performs these steps forever as it explores a new environment.