

CS 1567

Intermediate Programming and System Design Using a Mobile Robot

Lab 1: Robot Basics

This lab is designed to give you your first experience in programming the robots. It will also “encourage” you to be sure you understand the contents of the robot manual, and will give you your first opportunity to work with your teammates.

For each part of the lab, you should create a separate button on your robot control GUI. To check your work, we will click the button. Your program should then start running, and continue running until we exit the program. You can tell us the best way to exit.

1.1: The Dumb Wanderer

Write **DumbWanderer**.

When called, this will cause the robot to move at least 5 cm per second as long as its sonars do not detect an obstacle in its path. Before it hits anything it can see in its path, the robot should stop. If you remove the obstacle the robot should start to move again. *Ad nauseum*.

Note that this problem involves no robot rotation and that the obstacles are usually going to be tall, elongated objects called human legs, although at times they will be walls, chairs, or wastebaskets.

1.2: The Head Turner

Write **HeadTurner**.

When this is called, the robot should exhibit the behavior of rotating towards the closest object that its sonars detect.

With some care, your solution can look smooth and intelligent. For instance, it is a good idea for the robot to turn faster if the closest object is ninety degrees from its front than if it is twenty degrees away. We’ll be testing this function by walking around your robot.

1.3 The Centerer

Write **Centerer**.

Invoking this function should cause the robot to find the center of the room. It should make an announcement when it gets there.

1.4 The Follower

Write Follower.

This function should cause the robot first to find the center of the room and announce this. It should then remain still until an object comes within 10". At the point, the robot should announce that it has detected an object and should turn to that object, following it at a distance of approximately 15". If it loses the object, it should return to the center of the room and wait there until a new object comes within 10".

As you can see, you will have already done much of the work for this component of the lab.