

Programming a vacuum robot (infrared sensor)

Deadline: 25.4.2021

Points: 15

Material requirements: PC or Laptop (no Tablet) mit Browser (no Safari)



Topic description

Who doesn't know it, it's time to vacuum the room again and the only thought you have is - "I don't want to!"

Wouldn't it be great to have a robot that does it for you? Or maybe you even have a robot vacuum cleaner at home.

Now we want you to learn how to program your own robot vacuum cleaner, but because you would need too many things to do so, we have simulated an environment for you to solve this task.

We wish you a lot of fun with this and the following tasks!

Task description

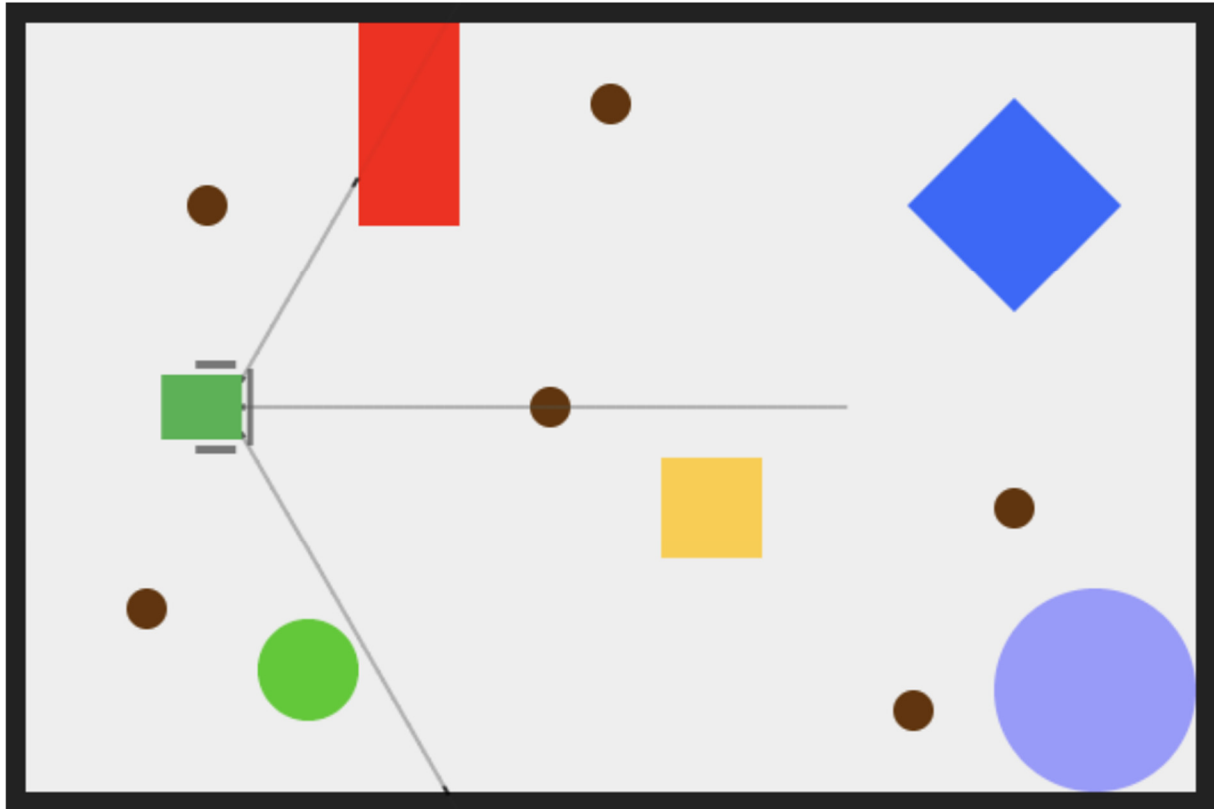
Visit our online simulation environment again (ide.pria.at) and create a new project with the "Staubsauger - Infrarotsensor" (Attention there are two similar tasks!) task as base. Open your project and the simulation task should look like this.

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For this task you should use sensors with which the robot should navigate through the room. Your robot has 3 infrared sensors with which it can measure the distance from itself to walls or other obstacles. You can see the sensors drawn in the simulation environment by the three lines that lead away from the robot. The infrared sensors have the following numbers: sensor left 4, sensor middle 5, sensor right 6.

In the category "Sensors" you will find a program block "value of analog sensor", with this you can write a program together with loops (Loops/Repeat) or logic decision blocks (if/falls), which reacts to the value of the sensors.

Now the task is to let the robot drive straight around in the room, if it recognizes that it comes too close to an obstacle, the robot should turn away and then drive straight on again. If the robot touches one of the brown dirt piles, it will pick it up. When you have collected all the piles, the task is successfully completed.

You must not touch any walls or obstacles during the cleaning process, otherwise the run will not be scored and you will have to reset the robot and restart the program.

For the maximum number of points let the robot turn randomly to the left or to the right and make the rotation for a reasonable (multiple rotations are not reasonable) random time.

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Please submit a screen video of your robot collecting as many dirt piles as possible. In addition, please submit your Blockly program file. Also, please submit a simple text document answering the following question: What is the difference between digital and analog sensors? Give an example of a digital and an analog sensor.



Evaluation criteria

- Number of dirt piles sucked away in your video
- Answering the question about digital or analog sensors
- Jury evaluation: The jury evaluates the quality and creativity of the submission.