technische universität dortmund

fakultät für informatik

CS 12 computer science 12

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Assignment 5

(10 Points)

To be treated in the week starting on Monday, June 7, 2010

This assignment sheet is to be solved during the lab session on June, 11th which takes place in **OH16/U09** at **10:15** or **12:15**, respectively. For preparation, review the tutorial slides presented on the previous lab and look for labview examples on the internet.

5.1 Collision detection (4 Points)

Develop a program for your robot which allows to detect collisions with objects (like walls, chairs etc.) while driving forward. Upon collision the robot shall continue in another direction.

1. Attach a bumper to the robot and check its functioning with the help of the LC-display of the NXT block.

2. Create a virtual instrument (VI), which allows the robot to bypass obstacles that it collides with. Transmit the program to the NXT block und verify the robot's behavior.

5.2 Follow the line (6 Points)

Attach your NXT robot with two light sensors aiming in downward direction. With their help, the robot shall be enabled to follow an arbitrarily formed black line.

1. Detemine the range of sensor values when a light sensor is moved over a dark or a light surface. This value also depends on the ambient light.

2. Design a VI that allows the robot to follow a black line. The robot's initial placement may be such that the black line is already between the two sensors. Ideally, it would find the line on its own, when started from inside or outside the given track.