

Exercise Sheet 6

(10 Points)

Lab exercises for the period from Wednesday, 29th November 2017

The lab exercises take place at room OH16/U08. The exercise sheets will be solved during the exercise sessions.

For this exercise sheet, we use the virtual machine **CPSF**.

6.1 Follow the line (5 Points)

Attach a light sensor pointing downwards to your EV3 robot in order to allow your robot to follow an arbitrary black line.

1. Determine the range of sensor values when the light sensor is moved over a dark or a light surface. This value also depends on the ambient light.
2. Design a virtual instrument that allows your robot to follow a black line. Ideally, it is able to find the line on its own when starting from inside or outside the given track.

6.2 In the disco (5 Points)

Extend your robot by an acoustical sensor and a lamp. Create a program to move your robot in forward direction. On the occurrence of a loud noise (like clapping hands), the robot shall perform different actions:

1. When clapping, the robot shall turn around its vertical axis by an angle of 360° .
(*Hint*: Utilize a motor component that takes an angle as its input.)
2. While turning, the robot shall play a sound file. On the EV3 block, multiple sound files (*.rso) can be found, that can be played back via the built-in speakers.
3. While turning, the robot shall make its lamp blink multiple times.
4. After this procedure, the robot shall continue its way.

General information: An overview about the exercise sessions as well as further information can be found on <https://ls12-www.cs.tu-dortmund.de/daes/de/lehre/lehrveranstaltungen/wintersemester-20172018/es-1718.html>. The exercise sheets will usually be published on the course website on Mondays and will be solved during the respective exercise sessions. The exercises are divided into two parts, in each of which at least 50% of the points must be achieved in order to receive the exam admission.