

Exercise Sheet 6

(10 Points)

Lab exercises starting from Monday, 2nd July 2018

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 On the golf course (10 Points)

Enable your robot to play golf. The test setup is as follows:

1. Place both pedestals in a distance of approximately 60cm and place a red ball on one and a blue ball on the other one.
2. The robot's initial position shall be between the two pedestals so that it points into the direction of one of the balls when moving forward.
3. The angle in which the robot approaches the balls should be arbitrarily chosen.

Hint: When placing a folded A4 paper sheet on a pedestal, it can be detected by the ultra-sonic sensor more easily.

Now create a VI exhibiting the following behavior:

1. From its initial position, the robot shall drive in forward direction until it gets so close (*ultra-sonic sensor*) to the ball that its color can be determined with a *light sensor*.
You can determine the proper sensor values for this operation by means of simple experiments.
2. From the current position, the following behavior should be shown:
 - If the blue ball has been detected, it shall be hit with the "golf club" attached to the robot.
 - If the red ball has been detected, the robot shall turn around, find the other pedestal and do the same.**Hint:** This obviously is the blue ball.

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/en/lehre/courses/sommersemester-2018/cyber-physical-system-fundamentals-ss-2018.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.