Series 5. Camera

Robotics, BSc Course, 2nd Sem., Prof. Béat Hirsbrunner, Simon Studer

Handout on Thursday, 19 March 2015 Due on Tuesday, 24 March 2015, 22:00

Reading
Study the lecture notes and source code available at http://diuf.unifr.ch/pai/rob > Lectures.

1. Camera measurements (only in the physical arena)
Measure the camera values on the three color channels of an e-puck in various settings. Design a setup experiment and analyze your result taking for example the following factors into account:

a. color of object
b. distance of object
c. angle to camera
d. lighting (well lit, dimly lit, natural light, …)
e. …

Redo your experiment with another robot and describe the differences if any.

Hint: avoid to take into account all 60 pixels separetely of the 3 color channels R, G, B, but use only a small subset of them.

2. Color recognition (only in the physical arena)
Implement a series of tests to recognize the following colors:

- red (e-puck1)
- green (e-puck2)
- blue (e-puck3)

The robot should give visual feedback about which colour he sees (red: 1 led on; blue: 2 leds on; green: 3 leds on), otherwise all leds off.

3. Color recognition (bis) (in the simulator and in the physical arena)
Implement the following scenario: 3 e-pucks explore the arena, giving visual feedback (as in exercice 2) about the colors they see. Record a short video.

Hint: 1) start with one robot until the code is working. 2) If you have 2 or 3 different recognizers, place them on different robots.

Hand in. Upload your answers as well as your source code from the simulation and the physical arena to http://diuf.unifr.ch/pai/rob > Upload by following the online recommendations.

Remark: Upload the video to our course site if low quality, or to a third party streaming host like Youtube, SwitchDrive, Dropbox, … providing us with the link.