

Final Mini-project in the Robotics Course: Make your own Behavioural Robot

April 2018

Henning Christiansen & Ole Torp Lassen
Roskilde University, IMT, Computer Science

Overall requirements

This is a fairly large assignment which takes up about one third of the course, so you are expected to put substantial effort into it, and you should finish it with a report that explains your robot and the experiences you made with it. The deadline for giving in your report is

Tuesday, May 1, 2018

and no extension is possible. Your report is not assessed separately, but will be your starting point for the oral exam. The more interesting report, the more there is for having an interesting discussion at the exam. However, at the exam, you are expected to demonstrate knowledge and understanding of all major topics covered in the course.

You are welcome (=recommended!) to work in small groups on developing your robot, but the report must be written and handed in (via moodle) individually by each student. The required size of the report is 10–20 pages (if you end up with a longer text, this is not a problem). We will meet the planned course days in the usual robot, and your teachers are readily available as your consultants and inspirators.

The Task: An Application of Behavioural Robotics

You should design, implement and test a robot-system to solve some suitable task of your choice, agreed upon with the course teachers. The robot must be an application of the Behavioural Robotics paradigm, as described in the course and in the text books (Jones; Bagnall). It must involve in a substantial way, one or more of the following key concepts from the course.

- Communication: e.g., client-server architecture, ev3-ev3, mixing autonomy with remote control,...
- Robot-vision: optical sensors, camera or image analysis.
- Localization, navigation or mapping.

- Non-trivial combination and interpretation of the available sensors (high-level sensors).

The application may be inspired from example programs from the course or elsewhere (and also borrow code lines, if you remember to add correct reference), but it must represent a nontrivial, independent and original design and implementation.

Tools

The robot must be based on the EV3 hardware and be implemented using LeJos, specifically its Behavior class. If you need more motors and sensors, we have lots of those in the version for NXT (the previous version of Mindstorms), and they work smoothly also with EV3.