Programming Embedded Systems with Lego Mindstorms

Content

In this lab course we will exercise programming embedded systems using Lego Mindstorms NXT. The development platform of choice will be the Java-based open source operating system Lejos. We will use it to develop robots that are able to interact with their environment via sensors and actuators. In the scope of this lab course we will construct and program mobile soccer robots via LEGO components. We will implement a video server that evaluates the position, angle and velocity of the ball and the robot in real-time using the video camera recording of the field, passing on the result to the robots via Bluetooth. At the end of the lab course we will arrange a competition between the participants.

In order to participate in this lab course, you require basic skills in Java or C++.

Dates

- The lab course will take place Wednesdays from 9:00am - 12:00pm in the chair's seminar room (room 2323, HBau, Ahornstr. 55).
- The introduction to the lab course will be on Apr 9th 2008, at 9:00am in the seminar room (room 2323, HBau Anhornstr. 55). During this session, we will introduce the robot soccer project and some organizational affairs. Participation is mandatory.
- There is a corresponding lecture held by Prof. Lichter on Apr 10th 2008, from 2:15pm-3:45pm in AH IV. You will acquire basic knowledge in software engineering, as well as in software architectures, programming guidelines, software tests etc.

Requirements

- Participation on all dates
- Delivery of all tasks and a successful presentation of your results (incl. questions)

Links

- Robotics Invention System
- leJOS
- IDE
- Lego users group network
- Free Java books
- Essentials - A NXT tutorial
- Bluetooth C++libraries
- LTI-Lib for image processing

- LEGO script
- Slides of the introductory meeting
- Latex template
- E-learning area in the L2P platform
- LEGO DIGITAL DESIGNER for the construction of LEGO NXT tool boxes

Tutor

- Dipl.-Inform. Jianmin Li