Programming Embedded Hardware

Contents

This lab course is addressed to students who have successfully finished their Vordiplom. In this course, students will have the opportunity of getting familiar with the chair's field of research through practical experience.

In the context of this lab course, modules for velocity measurement are to be developed having a connection to a CAN-bus for our model car. These modules are supposed to be implemented on different hardware platforms. Planned hardware platforms include an ATmega16 of ATMEL (8bit RISC Prozessor) and a Spartan-3 of XILINX (FPGA). A corresponding driver-unit kit will serve for the connection to the CAN-bus.

Extensive development environments are available for free, for both cases (microcontroller and FPGA). (AVR Studio 4 from ATMEL and ISE 7 from XILINX). Furthermore, we will provide 24 development-boards (12x microcontroller boards (type A) and 12x XILINX FPGA design kits) for this lab course.

It is intended to implement the modules on both the FPGA as well as on the microcontroller. In order to give you an easier start into these two fields, we will arrange a two-day-introduction before the actual lab course starts.

The participation in this lab course requires basic knowledge of the programming language C. Knowledge in the fields of microcontrollers and FPGAs is not a must, however you must attend the introduction course and be willing to get familiar with the topic. The FPGAs will be programmed in VHDL. Precognition of this language is advantageous but no must.

Additionally, the practical will take place in line with an experiment where the effects of different hardware platforms on software design will be analyzed. The attendance of this very experiment is no prerequisite for the attendance of the lab course as such.

At the end of the lab course, you will have to compose a 2 page documentation concerning the implemented functionality. We will provide a template for the documentation.

Schedule:

- Introductory course: Thu & Fr prior to the block course (2007-09-27/2007-09-28, 9:00am - 1:30pm), room 2323
- Block course: the last two weeks of the summer semester holidays (from 2007-10-01 to 2007-10-12, 9:00am - 5:00pm), room 2323
- We have chosen these dates taking into account possible collisions with exams or other lectures. Please contact the tutor (see below) in case of questions or remarks.
- Capacity: 24 students (six groups consisting of two people will start with microcontrollers, the other six groups of two people with FPGAs)
- Language: German (knowledge of the English language is however indispensable for reading

the documentations)
- Please register at the central distribution for seminars and lab courses.

Links and Downloads

- Task description (coming soon)
- Slides of the introductory course: Introduction to microcontrollers, Introduction to FPGAs
- MCU development environment: www.atmel.com (AVR studio, version 4 will be applied along with WINAVR in this lab course)
- FPGA development environment: Xilinx ISEWebPack + Mentor Modelsim (simulator)
- FAQs (MCU and FPGA design)
- Campus link
- Forum (can be used to share experiences with programming languages and design environments)

Contact

- Dr.-Ing. Falk Salewski

From:
https://embedded.rwth-aachen.de/ - **Informatik 11 - Embedded Software**

Permanent link:
https://embedded.rwth-aachen.de/doku.php?id=en:lehre:sose07:programming_embedded_hardware

Last update: **2011/11/21 17:27**