


Internship Program at Osnabrück University of Applied Sciences

Description of lab or research project

	<p>Lab for Digital Design and Microprocessor Technology</p>
<p>Head of the laboratory</p>	<p>Prof. Dr.-Ing. Markus Weinhardt Faculty of Engineering and Computer Science Albrechtstr. 30, D-49076 Osnabrück E-Mail: m.weinhardt@hs-osnabrueck.de Phone.: +49-541-969 3445</p>
<p>Title of Project</p>	<p>Hardware/Software Systems for High-Performance Computing, Image Processing and Robotics</p>
<p>Abstract</p>	<p>Depending on his/her skills and interests, an intern will contribute to one of the following projects:</p> <ol style="list-style-type: none">1. Research Project HiPReP („High-Performance Reconfigurable Processor“)<ol style="list-style-type: none">a) Hardware design, simulation and testing of the HiPReP coarse-grain reconfigurable array (CGRA)b) HiPReP compiler implementation and testingc) HiPReP application development2. Application and circuit development on field-programmable gate arrays (FPGAs)<ol style="list-style-type: none">a) Applications for reconfigurable SOCs consisting of an ARM processor and FPGA hardware.b) Design of dataflow components for FPGAs (image processing, arithmetic etc.)3. Implementation of autonomous vehicle control applications on multi-core systems and FPGAs

	4. Hardware and software development for robotics applications
Tasks	Depending on the topic selected, the intern will design and test hardware using the SystemC, Verilog or VHDL hardware description languages, program in C or assembler, or program in C++ within the LLVM compiler framework.
Requirements	Basic knowledge in programming, digital hardware design and computer architecture are required. Therefore, this internship is suitable for students of electrical engineering, computer science or computer engineering (preferably at Graduate level or advanced Bachelor level). Knowledge of and experience with parallel processors, compiler construction or digital systems design are beneficial, but not required.
Language Skills	English: fluent German: basic knowledge useful, but not required
Duration and time period	3 – 6 months in either the summer semester (March – August) or the winter semester (September – February) Specific dates and duration to be agreed upon
Further information	The internship will be part of a research or development project and will be supervised by a research assistant.