Interdisciplinary Project

Development of a web application to control a hardware demonstration platform
In this thesis, you lead the design and development of a web application to control a hardware demonstration platform and visualize the load of the available hardware resources, such as CPUs and hardware units. The used hardware platform is a Xilinx Zynq board. This features a heterogeneous ARM multicore setup directly integrated into the ASIC, combined with programmable logic in the FPGA part of the chip. In the FPGA, a hardware assist is implemented that improves blocking mechanisms in Linux by assisting the kernel with managing waiting threads. For further insights, the FPGA is also equipped with a 10G ethernet connection to send live data to a different PC for analysis and status information.

Responsibilities:

- Understand the hardware demonstration platform's functionality and requirements for visualization and control.
- Utilize your expertise in web development to design and create an interactive web application that visually represents hardware resource utilization (e.g., CPUs, hardware units) through graphs, charts, or other intuitive visualizations.
- Develop a user-friendly control interface within the web application allowing users to start, manage, and monitor software applications running on the demonstration platform.
- Conduct comprehensive testing, debugging, and optimization of the web application to ensure seamless functionality and performance.
- Engage in regular meetings, providing updates on the project’s progress, and actively participate in software design and implementation discussions.

Prerequisites

- Experience with data visualization libraries or similar tools to create dynamic and informative visual representations.
- First experience in web development projects, coursework, or internships showcasing relevant skills and expertise.
- Understanding of hardware resource monitoring and visualization concepts and the ability to translate these into effective user interfaces.
- Strong problem-solving skills, attention to detail, and the ability to work both independently and collaboratively in a team environment.
- Knowledge of system administration or hardware-related concepts to facilitate seamless integration between the web application and the demonstration platform.

Contact

Email: lars.nolte@tum.de

Advisors

Lars Nolte