PADERBORN UNIVERSITY

Open Master's Thesis Project

Computer Science Department
Computer Engineering Group
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Survey of ROS FPGA Frameworks

Robotics applications such as drones and self-driving cars have high computational demands. Field Programmable Gate Arrays (FPGAs) allow for highly parallel data processing at rather low energy envelopes and are thus promising compute elements for robotics. The Robot Operating System 2 (ROS 2) is a widely-used framework for developing robotics applications. The integration of FPGAs into ROS 2 is a hot research topic, where multiple approaches have been presented in the last years, such as ReconROS, FPGA-ROS, REP 2008, and Forest.

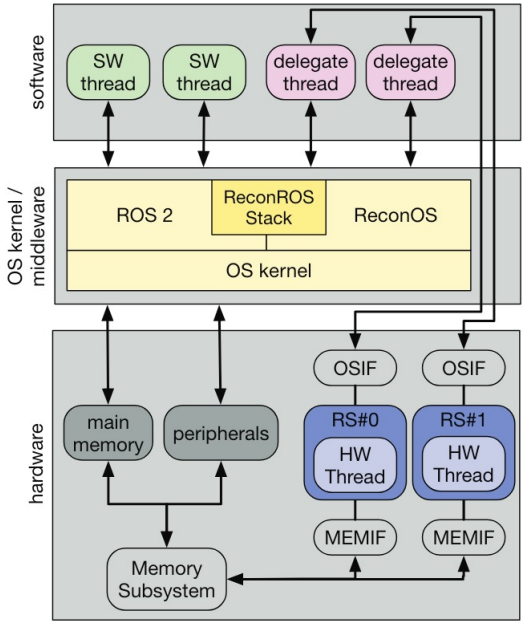
The goal of this thesis is to compare these approaches to gain insights into their advantages and limitations. The comparison will be based on available literature and on the implementation of smaller example applications and measurements of performance and resource utilization.

Type of project

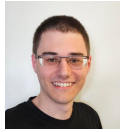
- Literature study on existing approaches for FPGA-ROS 2 integration
- Development of example applications and experimental evaluation of approaches

Prerequisites

- Programming skills in C/C++
- Experience with ROS 2, Linux, HDLs (Verilog or VHDL), and Xilinx tools is helpful



ReconROS Architecture



Interested?
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