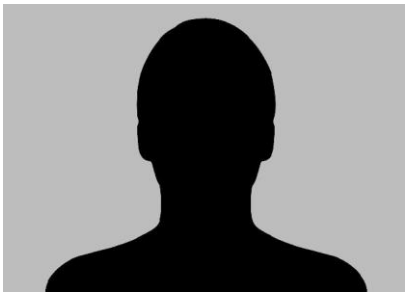
Zurich University
of Applied Sciences

School of Engineering

InES Institute of Embedded Systems

Optimal Platform Architecture for Nvidia Embedded Supercomputer



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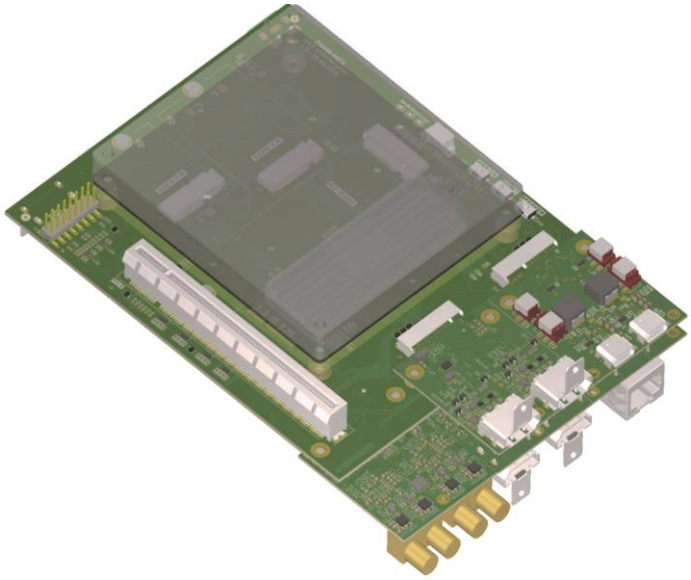
Embedded supercomputers (ESC) target a wide range of applications and offer a variety of interfaces to bring the data into the processing units. However, the fusion of high-performance blocks makes the chips expensive and the development complex, compared to standard processors.

Carrier board manufacturers for ESC inherit the complexity and try to include as many physical interfaces as possible on their boards. Hence, the price of the carrier boards increases. Nevertheless, different applications demand a reduced set of different interfaces, so a complex carrier board is always only partially used.

This thesis proposes an implementation of a modular carrier board to increase the utilization of hardware and reduce the overall system price. To develop an optimal, modular platform for the Nvidia Xavier, the internal peripherals are grouped to functional blocks and a market analysis derives desirable converters in different applications. For each block a standardized extension module interfaces is defined. The end-product is a minimal carrier board with simple access to all functional blocks without limitations in functionality of the ESC.

Five extensions modules are developed to make a comparison between a modular carrier board and existing solutions. The new approach is configurable with simple, specialized modules and increases the utilization of an embedded supercomputer without increasing the complexity and cost.



Resulting Hardware: Modular carrier board for Nvidia Xavier with five extension modules