

Forschungspraxis

Application Scheduling on self-aware Embedded Systems

Today's Multi-Processor System-on-Chip (MPSoCs) are getting more and more complex due to the growing amount of cores and accelerators. Hence it's not possible anymore to set runtime parameters like frequency and task distribution by design time in an optimal manner. Therefore future controllers try to make use of machine learning which is aware of the system's current state (self-awareness).

Information Processing Factory (IPF) is a global project that claims to show self-awareness across multiple abstraction levels. It represents a paradigm shift in platform design by envisioning the move towards a consistent platform-centric design in which the combination of self-organized learning and formal reactive methods guarantee the applicability of such cyber-physical systems in safety-critical and high-availability applications.

At TUM, we explore the application and implementation of machine learning algorithms in hardware to optimize the mode of operation of MPSoCs at runtime.

Currently we are running a quite simple program on our MPSoC which doesn't allow us to evaluate all the features our self-aware system provides.

Therefore, it would be your task to develop a easily configurable software to be executed on the MPSoC which schedules different benchmarks.

Towards this goal, you'll complete the following tasks:

1. Literature research on embedded benchmarks + scheduling mechanisms
2. Getting familiar with our SparcV8 (Leon 3) architecture
3. Porting different benchmarks
4. Implementing and evaluating your scheduler

Prerequisites

- Good Knowledge about MPSoCs
- Good C knowledge
- Maybe bash and xconfig knowledge

Contact

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Advisors

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