Chair for Integrated Systems
TUM Department of Electrical and Computer Engineering
Technical University of Munich

Master's Thesis

Investigation of Parameter Optimization Periods in Self-aware MPSoCs

Within our IPF project, we use rule-based RL to optimize runtime parameters (task mapping, DVFS) of MPSoCs.
At the current state, the decision periodicity is fixed to 5 ms. Initial experiments showed, that the MPSoC operation might benefit of way faster adaptations (1 to 2 orders of magnitude faster for DVFS). This might strengthen the argument for our concept of hardware-based RL. On the other hand, it's known, that too many task migrations cause timing overhead due to the transfer of data over the shared bus.

The goal of this thesis is to investigate different periodicities and policies for periodicity adaptations. Metrics involved in these policies might be the type of decision (task migration or DVFS) and variation frequencies of IPS, memory vs. compute phases, etc. of a task.

Therefore, different scheduling methods should be investigated based on a literature study and measurements for different tasks should be conducted. Afterwards simulations will be done in Matlab, before implementing one approach in HW and evaluate its applicability.

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