

Automatic Design Space Exploration for SystemC Models

SystemCoDesigner

SystemCoDesigner is a software tool for automatic design space exploration at the system level. The input is a functional models written in SystemC. The goal is to optimally allocate resources and bind the SystemC modules onto these allocated resources. For this purpose, the designer has to specify the architecture template (as a graph) and all possible bindings of SystemC functions onto the resources in the architecture template. The performance evaluation of each implementation, i.e., the allocation and binding, during design space exploration is done using the SystemC simulation kernel and a novel system-level simulation framework called *Virtual Processing Components (VPC)*. In order to allow a function-accurate performance simulation of the SystemC functional model mapped onto a heterogeneous multi-processor architecture, the designer has to specify the scheduling policy used by each resource as well as the worst case execution times for each function mapped onto a resource.

SystemCoDesigner provides a graphical user interface, including a front end for specification of the architecture template and bindings as well as a visualization of the design space exploration and optimal implementations (see Figure 1). The automatic exploration is guided by state-of-the-art Multi-Objective Evolutionary Algorithms in combination with Symbolic Techniques.

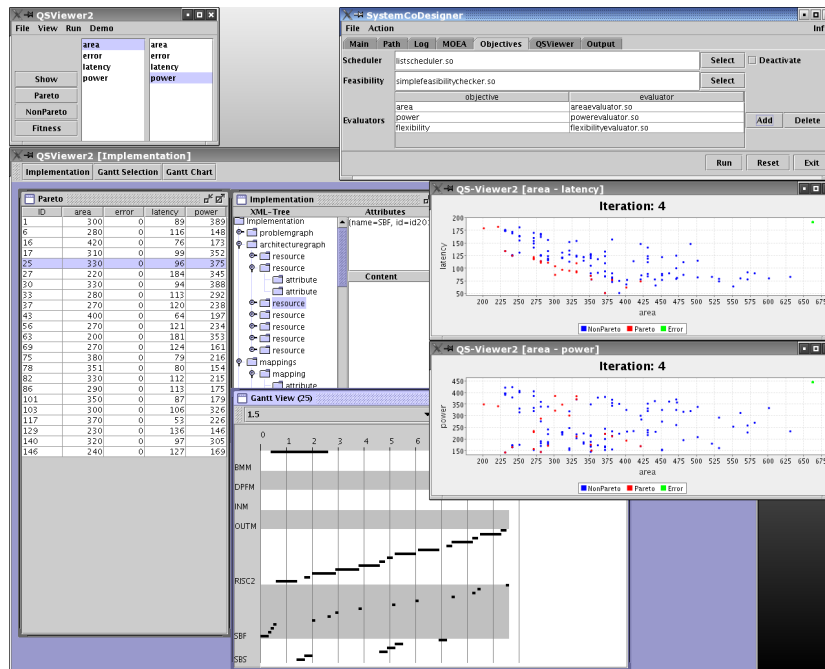


Figure 1: GUI of the SystemCoDesigner