MULTICUBE

MULTI³

MULTI-OBJECTIVE DESIGN SPACE EXPLORATION OF MULTI-PROCESSOR SOC ARCHITECTURES FOR EMBEDDED MULTIMEDIA APPLICATIONS

http://www.multicube.eu

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Partners: Politecnico di Milano (Italy),
Design of Systems on Silicon – DS2 (Spain),
STMicroelectronics (Italy), IMEC (Belgium),
ESTECO (Italy), University of Lugano - ALaRI (Switzerland),
University of Cantabria (Spain),
STMicroelectronics Beijing (China),
Institute of Computing Technology – Chinese Academy of
Science (China)
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Main Objectives

Many point tools exist to optimize particular aspects of embedded systems. However, an overall design space exploration framework is needed to combine all the decisions into a global search space, and a common interface to the optimization and evaluation tools.
The **MULTICUBE** project focuses on the definition of an automatic multi-objective Design Space Exploration (DSE) framework to be used to tune the System-on-Chip architecture for the target application evaluating a set of metrics (e.g. energy, latency, throughput, bandwidth, QoS, etc.) for the next generation of embedded multimedia platforms.

Key Issues

1. Increased productivity of system development through a fast, reliable DSE process to find optimized solutions in a short time
2. Improved competitiveness of European companies that rely on the design and integration of embedded systems in their products by reducing costs and time to market.
3. Stimulate high-tech European SMEs (ESTECO) that offers general-purpose innovative design solutions and tools to apply them for embedded systems design.
4. Reinforced European scientific and technological leadership in the engineering of complex systems both at the industry side (STM and DS2) and the academic and research side (IMEC, Politecnico di Milano, ALaRI, University of Cantabria and ICT).
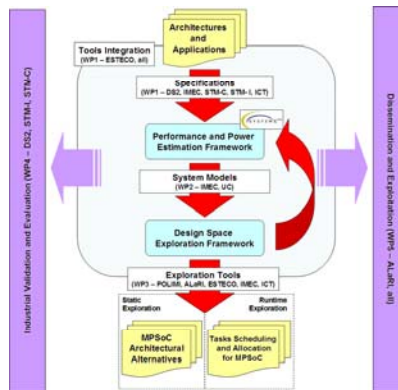
Expected Results

1. Design Space Exploration flow for complex heterogeneous multiprocessor SoC with NoC;
2. Multi-level SystemC specification and modeling methodology for complex heterogeneous multiprocessor SoC with NoC;
3. Performance estimation tool for complex heterogeneous multiprocessor SoC with NoC providing accurate estimation of metrics;
4. Run-time Pareto manager which selects the appropriate Pareto alternative from the set generated by the design space exploration.

Expected Impact

The design methodology will be implemented at system-level in a set of open-source and proprietary EDA tools to guarantee a large exploitation of the results of the MULTICUBE project in the embedded system design community.
The overall goal is to support the competitiveness of European industries by optimizing embedded HW/SW systems while reducing the design time and costs.

Roles of Partners

The MULTICUBE project is strongly industry-driven. Two European industrial partners (STMicroelectronics Italy and DS2) and STMicroelectronics China will define the requirements of the design tools and validate step-by-step the results of the exploration tools to design a set of target industrial applications.
The integration of design tools and the commercial exploitation of the tools will be done by an European SME, ESTECO. ALaRI will be mainly in charge of the dissemination and exploitation activities.
The research and technological development will mainly be done by IMEC, Politecnico di Milano, University of Cantabria and the Institute of Computing Technology – Chinese Academy of Sciences.

www.polimi.it   www.ds2.es   www.st.com   www.imec.be   www.esteco.com   www.alari.ch   www.unican.es   www.ict.ac.cn