Algorithm parallelization for Multicore Architectures

Faster time-to-market for embedded multicore systems with less application development effort

FEATURES
Develop algorithms and tools to:

- Automatic parallelization of high-level Scilab algorithms to embedded MPSoCs
- Hide hardware complexity from the software developer
- Provide target-agnostic parallelization tools
- Iterative performance estimation and optimizations

RESULTS
Automatic conversion from Scilab to embedded C Code
Automatic parallelization to 4 processing cores
Minimization of sequential code
Equal Workload distribution
x2.4 application speedup

ALMA
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3,200,000 €
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Duration
41 Months

Application Test Case
- IEEE 802.16e PHY Layer in NT x NR MIMO Configuration
- State-of-the-art WiMAX wireless communication

Scilab Input Language
- ALMA subset of the Scilab language
- Extended by
  - Variables declaration
  - Static types specification
  - Maximum size of vector/matrix data type definition

Matrix Frontend (MFE)
- Translate Scilab intermediate representation
- Generates static C code optimized for parallelization
- Constant and data type propagation

Iterative Optimization
- Simulation and Performance Analysis of intermediate results
- Performance metric feedback-loop

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