METHOD FOR SELECTING A HARDWARE ARCHITECTURE FOR IMPLEMENTING A SOFTWARE APPLICATION

Technological advantages

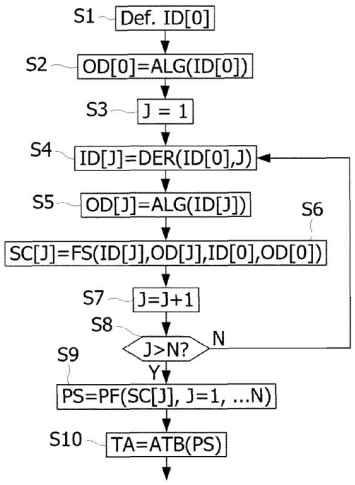
- Rapid determination of optimal hardware architecture.
- Avoids costly empirical trials and complex simulations.
- No detailed code knowledge or target architecture specifics needed.
- Compatible with any processor supporting the application's language.
- Evaluates application parallelism via a "parallelization score."

Invention synthesis

This invention introduces an innovative method for determining the most suitable hardware architecture for a given software application, based on how the application reacts to changes in its input data. Instead of relying on tedious testing across various platforms or in-depth code analysis, the process executes the application with an initial set of data, then performs iterations by selectively modifying one input data point at a time. For each iteration, a metric is calculated, measuring the impact of this modification on the output data. These metrics are then aggregated to obtain a "parallelization score," which indicates the inherent degree of parallelism within the application. This score allows for the selection of the ideal hardware architecture (microprocessor, GPU, FPGA, etc.), significantly simplifying and accelerating the deployment and optimization process for applications.

Potential applications

- Optimization of embedded application deployment.
- Hardware architecture selection for artificial intelligence systems.
- Design of hardware platforms for specific software.



Steps for determining a target hardware architecture
(ID0) first set of input data of the application
(AL2) application
(PRC) processor
(OD0) first set of output data
(ID1,ID2) second set of input data
(OD1,OD2) second set of output data
(PS) parallelization score from the metrics computed at each iteration

Commercial benefits

- Large reduction in development and integration costs.
- Faster time-to-market for products and solutions.
- Optimization of hardware resources, leading to cost savings.
- Informed decision-making for hardware procurement or development.
- Increased application performance and competitiveness.

Patented invention - under license.

For more information :

valorisation@cnes.fr