Performance analysis and tuning is an important step in programming multicore and manycore architectures. There are several tools to help developers analyze application performance; still, no tool provides recommendations about how to tune the code.

AutoTune will extend Periscope, an automatic online and distributed performance analysis tool developed by Technische Universität München, with plugins for performance and energy efficiency tuning. The resulting Periscope Tuning Framework will be able to tune serial and parallel codes with and without GPU kernels; in addition, it will return tuning recommendations that can be integrated into the production version of the code. The whole tuning process, consisting of both automatic performance analysis and automatic tuning, will be executed online, i.e. during a single run of the application.

Project Goals

The AutoTune Project’s goal is to close the gap in the application tuning process and simplify the development of efficient parallel programs. To achieve this objective, AutoTune aims at developing the Periscope Tuning Framework (PTF), the first framework to combine and automate both analysis and tuning into a single tool.

AutoTune’s PTF will...

- Identify tuning alternatives based on codified expert knowledge.
- Evaluate the alternatives online (i.e. within the same application execution), reducing the overall search time for a tuned version.
- Produce a report on how to improve the code, which can be manually or automatically applied.

Key Features

- Automatic performance tuning of parallel codes
- Increased programmer productivity on GPU accelerated systems.
- GPU programming with HMPP, OpenCL and CUDA
- Single-core performance tuning
- MPI tuning
- Energy efficiency tuning

Consortium

- Technische Universität München, Germany (Coordinator)
- CAPS Entreprise, France
- Leibniz Supercomputing Centre, Germany
- Irish Centre for High-End Computing, Ireland
- Universitat Autonoma de Barcelona, Spain
- Universität Wien, Austria

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