

Call for Papers

High performance computing on Cell B.E. processors

Guest editors:

Michael Gschwind, IBM T.J. Watson Research Center
Fred Gustavson, IBM T.J. Watson Research Center

Call for papers

High performance computing aims at maximizing the performance of grand challenge problems such as protein folding and accurate real time weather prediction. Where in the past, performance improvements were obtained by aggressive frequency scaling using microarchitecture and manufacturing techniques, technology limits require future performance improvements be obtained from exploiting parallelism with a multi-core design approach. The Cell Broadband Engine is an exciting new execution platform answering this design challenge for compute-intensive applications that reflects both the requirements of future computational workloads and manufacturing constraints. The Cell B.E. is a heterogeneous chip multiprocessor architecture with compute accelerators achieving in excess of 200 GFlop per chip.

To exploit multicore systems, algorithms and compilers will have to turn toward concurrency in their software. By doing so, it is possible to reap its high-performance computing capabilities. To address this challenge, algorithm designers must conceive of new ways and new algorithms to replace software optimized for previous generations of systems. In the broadest sense, the notion of algorithm designers includes programmers, library generation systems and compilers.

Accordingly, we issue a call for papers to address the issues that are raised for multicore architectures with particular emphasis on the Cell B.E. architecture. Topics of particular interest are, but are not restricted to:

- Application studies
- New algorithms for use with parallel SIMD architectures
- Data organization and layout for memory, local stores and SIMD vector register files
- New algorithms for exploitation of explicitly managed memory hierarchies and high performance memory transfer and streaming engines
- Numeric libraries and computation frameworks for the Cell Broadband Engine
- Tools for performance analysis and visualization of processing intensive applications
- Linear algebra methods
- Studies of novel computationally intensive application areas, their characteristics and mapping to computer accelerators
- Code optimization studies

Important dates

May 15, 2008	Deadline for submission of papers
August 2008	Notification of acceptance/rejection
September 2008	Camera ready versions due
Late 2008	Publication of the special issue

Submission instructions

Authors are encouraged to submit high quality, original work that has neither appeared in, nor is under consideration by other journals. The manuscript must follow the formatting instructions found at the Scientific Programming site <http://www.iospress.nl/loadtop/load.php?isbn=10589244>. The papers for this special issue must be submitted directly as a PDF file via e-mail to: mikeg@watson.ibm.com.