

Contacts

Special Issue Coordinator: Giuliano Laccetti

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Important Dates (extended)

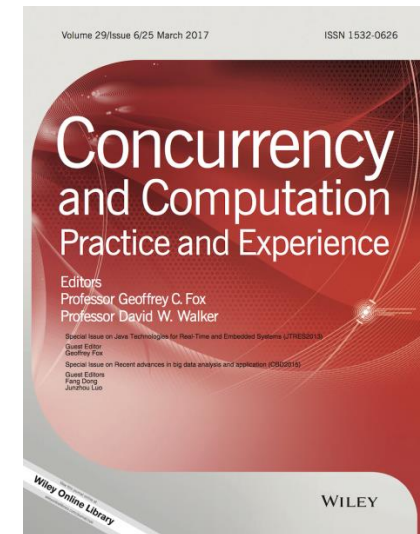
- submission deadline: January 20th, 2018 (extended)
- 1st review round: March 20th, 2018
- Submission deadline for revised versions: April 20th, 2018
- Final Decision: May 20th, 2018
- Electronic Publication: four months after all final papers submitted.

Link to the special issue call

<http://www.cc-pe.net/journalinfo/issues/2017.html#MATHHCE2017>

Concurrency and Computation: Practice and Experience

Special Issue Call for Papers



Editors: G. Fox and D. Walker

Models, Algorithms and Tools for Highly Heterogeneous Computing Environments (MATHHCE2017)

Guest Editors

- Sokol Kosta, University of Aalborg, Denmark (guest editor)
- Giuliano Laccetti, University of Naples Federico II, Italy (guest editor)
- Marco Lapegna, University of Naples Federico II, Italy (guest editor)
- Raffaele Montella, University of Naples Parthenope, Italy (guest editor)
- Ian Foster, Argonne National Laboratory and University of Chicago, USA (associate guest editor)
- Paul Messina, Argonne National Laboratory, USA (associate guest editor)
- Almerico Murli, SPACI, Italy (associate guest editor)

Topics

Over the past decade we have witnessed the rise of new programming models that have to take into account the architecture of modern and innovative computing environments. From one side there are new generation High Performance Computing environments aimed to achieve extreme performance. They integrate together several independent nodes each of them composed by powerful computing elements (CPU core, GPUs or other acceleration devices) sharing resources in a single node. These systems make massive use of communication libraries and other tools for the management of the shared resources. Furthermore there are Grid and Cloud computing environments. They can be described by a collection of large and heterogeneous resources such as clusters and storage systems, connected among them by geographical networks with the primary aim to present them as a single computing system in a transparent mode. This aim is realized by means of sophisticated middlewares acting as operating systems that are in charge of the efficient management of resources. Finally there are new Internet of Things and Mobile Computing environments, aimed to make transparent and friendly usable low power and heterogeneous resources as well as sensors and actuators, connected among them in a highly unstructured way. These environments make massively use of pervasive virtualization tools with the aim not only to realize smart environments, but also for scientific computing.

Beyond the differences in the objectives, these environments have a common feature: the need to integrate heterogeneous components that require different programming models. For such a reason, the development of algorithms and scientific software for these systems implies a suitable combination of several methodologies and tools to deal with the different kinds of parallelism corresponding to each specific device, so that to be aware of the underlying platform. Further problems depend moreover on the specific programming environments features. For example HPC systems have to deal with the large parallelism degree and the energy supply, while for the Grid and Cloud computing environments, the fault tolerance and the load balancing among the resources is of paramount importance. Finally the Internet of Things and Mobile Computing environments must be in charge of the interfacing of low power devices and HPC systems for scientific computing and data management purposes. This special issue, therefore, focuses specifically on Models, Algorithms and Tools to exploit all forms of parallelism and their combination in the emerging environments also for the solution of

real world problems, with the goal of gathering the current state of knowledge in the field.

Paper Submission and Publication

All submitted papers are subject to the same review process as those ones accepted for publication in the regular issues. The special issue seeks original papers on the range of topics related to hybrid parallelism including, but not limited to:

- Heterogeneous algorithms with multiple forms of parallelism
- Auto tuning techniques for heterogeneous and parallel environments
- Techniques for multi-/many-core platforms, NUMA architectures, or accelerator devices
- Synchronization and access to shared resources
- Multi-level cache management
- Task scheduling and load balancing among computing elements
- Fault tolerant implementations of scientific algorithms
- Performance and scalability models
- Tools and programming environments supporting efficient usage of different form of parallelism.
- Resources virtualization for High Performance Computing on low power devices
- Programming environments for high performance cloud computing with GPGPUs and FPGAs
- Algorithms for scientific computing on Internet of Things environments
- Data science oriented multi-level algorithms for low-power embedded and mobile devices systems
- Solution of real world applications with new heterogeneous systems

Authors are encouraged to submit high-quality original works that has neither appeared in, nor is under consideration by, other journals.

Paper must be prepared in accordance with the Journal guidelines : <http://www.cc-pe.net/journalinfo/authors.html>

Manuscripts must be submitted to <https://mc.manuscriptcentral.com/cpe>, selecting "special issue" type in step 1 of the submission procedure and specifying the name of the special issue in the step 4.