

Tenth International Workshop on Algorithms, Models and Tools for Parallel Computing on Heterogeneous Platforms (HeteroPar'2012)

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The International Workshop on Algorithms, Models and Tools for Parallel Computing on Heterogeneous Platforms (HeteroPar'2012) was held, on its tenth edition, in Rhodes Island, Greece. For the fourth time, this workshop was organized in conjunction with the Euro-Par annual series of international conferences dedicated to the promotion and advancement of all aspects of parallel computing.

Heterogeneity is emerging as one of the most profound and challenging characteristics of today's parallel environments. From the macro level, where networks of distributed computers, composed by diverse node architectures, are interconnected with potentially heterogeneous networks, to the micro level, where deeper memory hierarchies and various accelerator architectures are increasingly common, the impact of heterogeneity on all computing tasks is increasing rapidly. Traditional parallel algorithms, programming environments and tools, designed for legacy homogeneous multiprocessors, can at best achieve on a small fraction of the efficiency and potential performance we should expect from parallel computing in tomorrow's highly diversified and mixed environments. New ideas, innovative algorithms, and specialized programming environments and tools are needed to efficiently use these new and multifarious parallel architectures. The workshop is intended to be a forum for researchers working on algorithms, programming languages, tools, and theoretical models aimed at efficiently solving problems on heterogeneous platforms.

The topics to be covered include but were not limited to:

- Heterogeneous parallel programming paradigms and models;
- Languages, libraries, and interfaces for different heterogeneous parallel programming models;
- Performance models and their integration into the design of efficient parallel algorithms for heterogeneous platforms;
- Parallel algorithms for heterogeneous or hierarchical systems, including many-cores and hardware accelerators (FPGAs, GPUs, etc.);
- Parallel algorithms for efficient problem solving on heterogeneous platforms (numerical linear algebra, nonlinear systems, fast transforms, computational biology, data mining, multimedia, etc.);
- Software engineering for heterogeneous parallel systems;

- Applications on heterogeneous platforms;
- Integration of parallel and distributed computing on heterogeneous platforms;
- Experience of porting parallel software from supercomputers to heterogeneous platforms;
- Fault tolerance of parallel computations on heterogeneous platforms;
- Algorithms, models and tools for grid, desktop grid, cloud, and green computing.

This year edition the workshop attracted a large number of papers, with a total of 28 papers being submitted for consideration. From these 28 papers, 10 were selected by the program committee, with most papers receiving 4 reviews, and only a few of them with 3 reviews.

Additionally to the regular papers, a keynote presentation was given by Enrique Quintana, Universitat Jaume I, SPAIN, about how model order reduction, an important control theory application, which required the use of a moderate size cluster even for a moderate dynamical system only a few years ago, can nowadays be easily solved using an optimized algorithm for a hybrid CPU-GPU platform. A paper about the contents of the talk is also included in these proceedings.

The papers accepted for presentation in the workshop deal about different aspect of heterogeneous computing, such as: new programming models and their extensions for these type of architectures, new scheduling policies for heterogeneous platforms, new methods to solve algorithms, experiences with applications, alternatives for communication algorithms, etc.

Between all the accepted papers, the program committee decided to nominate as best paper the one entitled: *Weighted Block-Asynchronous Iteration on GPU-Accelerated Systems*. However, this was a difficult task since all papers were of high quality and together with the keynote presentation the workshop become an excellent event.