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Proceedings of the 2010 International Workshop on
Parallel Symbolic Computation

Sponsored by:

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Marc Moreno Maza & Jean-Louis Roch

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Foreword to the PASCO 2010 Conference

The International Workshop on Parallel and Symbolic Computation (PASCO) is a series of workshops dedicated to the promotion and advancement of parallel algorithms and software in all areas of symbolic mathematical computation. The pervasive ubiquity of parallel architectures and memory hierarchy has led to the emergence of a new quest for parallel mathematical algorithms and software capable of exploiting the various levels of parallelism: from hardware acceleration technologies (multicore and multi-processor system on chip, GPGPU, FPGA) to cluster and global computing platforms. To push up the limits of symbolic and algebraic computations, beyond the optimization of the application itself, the effective use of a large number of resources (memory and specialized computing units) is expected to enhance the performance multi-criteria objectives: time, energy consumption, resource usage, reliability. In this context, the design and the implementation of mathematical algorithms with provable and adaptive performances is a major challenge.

Earlier meetings in the PASCO series include PASCO'94 (Linz, Austria), PASCO'97 (Maui, U.S.A.), PASCO'07 (London, Canada). PASCO 2010 is affiliated with the 2010 International Symposium on Symbolic and Algebraic Computation (ISSAC) in Munich, Germany. Immediately prior to the ISSAC 2010 meeting, PASCO is held in Grenoble, France.

The workshop PASCO 2010 is a three-day event including invited presentations and tutorials, contributed research papers and a programming contest. The call for papers solicited contributions from areas including:

- Design and analysis of parallel algorithms for computer algebra
- Practical parallel implementation of symbolic or symbolic-numeric algorithms
- High-performance software tools and libraries for computer algebra
- Applications of high-performance computer algebra
- Distributed data-structures for computer algebra
- Hardware acceleration technologies (multi-cores, GPUs, FPGAs) applied to computer algebra
- Cache complexity and cache-oblivious algorithms for computer algebra
- Compile-time and run-time techniques for automating optimization and platform adaptation of computer algebra algorithms

In response, 27 submissions (full papers and extended abstracts) were received, The program committee collected 88 referee reports. After careful consideration, 21 submissions were accepted for presentation and inclusion in the proceedings. In addition, we are grateful that the majority of the invited speakers contributed full papers as well.

We are grateful to all who contributed to the success of our meeting:

- the invited speakers and their co-authors:
  Claude-Pierre Jeannerod (France), Hervé Knochel (France), Christophe Mouilleron (France), Christophe Monat (France), Jean-Michel Muller (France), Erich L. Kaltofen (USA), Guillaume Revy (France), Stephen Lewin-Berlin (USA), Christian Bertin (France), Jeremy R. Johnson (USA), Jingyan Jourdan-Lu (France), Daniel Kunkle (USA)

- the authors of full papers and extended abstracts;

- the members of the program committee:
  Daniel Augot (France), Anton Leykin (USA), Jean-Claude Bajard (France), Gennadi Malaschonok (Russia), Olivier Beaumont (France), Michael Monagan (Canada), Bruce Char (USA), Winfried Neun (Germany), Gene Cooperman (USA), Clément Pernet (France), Gabriel Dos Reis (USA), Nicolas Pinto (USA), Jean-Christophe Dubacq (France), Manuel Prieto-Matias (Spain), Jean-Guillaume Dumas (France), Markus Pueschel (USA), Jean-Charles Faugère (France), Nathalie Revol (France), Matteo Frigo (USA), David Saunders (USA), Thierry Gautier (France), Éric Schost (Canada), Pascal Giorgi (France), Wolfgang Schreiner (Austria), Stef Graillat (France), Arne Storjohann (Canada), Jeremy Johnson (USA), Sivan Toledo (Israel), Erich Kaltofen (USA), Gilles Villard (France), Herbert Kuchen (Germany), Yuzhen Xie (Canada), Philippe Langlois (France), Kazuhiro Yokoyama (Japan)

- the local organizers, all from Grenoble University or the INRIA Grenoble:
  Daniel Cordeiro, Clément Pernet, Jean-Guillaume Dumas, Christian Séguy, Thierry Gautier, Ahlem Zammit-Boubaker, Daniele Herzog

- the anonymous reviewers;

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Marc Moreno Maza — *London*
Jean-Louis Roch — *Grenoble*
July 4, 2010

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