

Preface

VECPAR is an international conference series dedicated to the promotion and advancement of all aspects of high-performance computing for computational science, as an academic discipline and as a technique for real-world applications, extending the frontier of the state of the art and the state of practice. The audience and participants of VECPar are researchers in academy, laboratories, and industry. The memory of the conference is preserved at <http://vecpar.fe.up.pt>.

The 11th edition of the conference, VECPar 2014, was held in Eugene, OR, during June 30 – July 3, 2014. It was the sixth time the conference was held outside its “birth place,” in Porto (Portugal), succeeding Valencia (Spain) in 2004, Rio de Janeiro (Brazil) in 2006, Toulouse (France) in 2008, Berkeley (USA) in 2010, and Kobe (Japan) in 2012.

The conference program consisted of 2 invited talks, 18 papers, and 11 posters. The invited talks were presented by John Shalf, “Exascale Programming Challenges: Adjusting to the New Normal for Computer Architecture,” and Masaki Satoh, “A Super High-Resolution Global Atmospheric Simulation by the Nonhydrostatic Icosahedral Atmospheric Model Using the K Computer.” In his talk, Dr. Shalf discussed challenges of programming future computing systems, with very high level of parallelism, and provided some highlights from the search for durable programming abstractions to more closely track emerging computer technology trends to guarantee the longevity of codes. In his talk, Dr. Satoh discussed a new type of the global atmospheric model called NICAM (non-hydrostatic icosahedral atmospheric model) that covers the Earth with a quasi-uniform mesh, and whose horizontal interval can be a subkilometer by using a high-end computer. He also gave an overview of recent results from super-high resolution simulations with NICAM using the K computer at the RIKEN AICS, in Kobe, Japan.

The major themes of the conference (thus the accepted papers and posters) were:

- Large-scale Simulations in CS&E
- Parallel and Distributed Computing
- Numerical Algorithms for CS&E
- Multiscale and Multiphysics Problems
- Data Intensive Computing
- Performance Analysis

The most significant contributions of VECPar 2014 have been made available in the present book, edited after the conference, and after a second review of all orally presented papers. The first round of reviews was based on an eightpage extended abstract. Each paper was reviewed by three reviewers; in some cases, a fourth reviewer helped in the final decision. Out of 32 submissions, 18 were accepted for presentation. For the second round of reviews, authors were given a larger page budget, so they could better address reviewers’ comments and suggestions. Finally, 17 were accepted for publication in this book.

In addition, three related events were organized in the first two days of the conference:

- The Ninth International Workshop on Automatic Performance Tuning (iWAPT 2014), whose contributions are also included in this book,
- Tutorial on Trilinos, a software library for solving large-scale mathematical problems arising in science and industry,
- Programming and Optimizing for the Intel® Xeon Phi™ Coprocessor, in which participants could learn about programming models and optimization for that architecture, complemented with hands-on work.

VECPAR 2014 took place at the University of Oregon and Hilton Conference Center, in Eugene, Oregon, USA. Paper submissions were managed with the EasyChair conference system; the conference website and registration process were managed by the University of Oregon.

The success of VECPar and the long life of the series result from the work of many people. As in all previous occasions, a large number of collaborators were involved in the organization and promotion of the conference. Here, we would like to express our gratitude to Allen Malony and Sameer Shende, and the iWAPT organizers, in particular Franz Franchetti and Yusaku Yamamoto.

We thank all authors who have contributed to this book, for adhering to the deadlines and responding to the reviewers' comments and suggestions, and all members of the Scientific Committee, who greatly helped us with the paper selection process.

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