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Shared Memory Parallel Programming with OpenMP

5th International Workshop
on OpenMP Applications and Tools, WOMPAT 2004
Houston, TX, USA, May 17-18, 2004
Revised Selected Papers



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Preface

This book contains the Proceedings of the 5th Workshop on OpenMP Applications and Tools (WOMPAT 2004), which took place at the University of Houston, Houston, Texas on May 17 and 18, 2004. Previous workshops in this series took place in Toronto, Canada, Fairbanks, Alaska, Purdue, Indiana, and San Diego, California. The purpose of the workshop was to bring together users and developers of the OpenMP API for shared memory parallel programming to disseminate their ideas and experiences and discuss the latest developments in OpenMP and its application. To support this aim, the program comprised a mixture of invited talks from research and industry, experience reports, and submitted papers, the last of which are presented in this volume.

A tutorial introduction to OpenMP was held at the same location on May 18 by Ruud van der Pas from Sun Microsystems. Further, a two-day lab session called OMPlab was held immediately following the workshop and the tutorial on May 19 and 20, and was attended by both novice and advanced users. Many of the hardware vendors and several researchers gave in-depth tutorials on their software and made their systems available to both novice and advanced attendees during OMPlab. Contributors to the WOMPAT 2004 OMPlab included IBM, Intel, Sun, the University of Tennessee, NASA, the University of Greenwich, Cornell University, the University of Oregon and the University of Houston.

The OpenMP API is a widely accepted standard for high-level shared memory parallel programming that was put forth by a consortium of vendors in 1997. It is actively maintained by the OpenMP Architecture Review Board, whose members consist of most hardware vendors, high-performance compiler vendors, and several research organizations including cOMPunity, which works to engage researchers in the standardization efforts and to ensure the continuation of the WOMPAT series of events. OpenMP is still evolving to ensure that it meets the needs of new applications and emerging architectures, and WOMPAT workshops, along with their Asian and European counterparts (WOMPEI and EWOMP, respectively) are among the major venues at which users and researchers propose new features, report on related research efforts, and interact with the members of the OpenMP Architecture Review Board.

The papers contained in this volume were selected by the WOMPAT 2004 Program Committee from the submissions received by the organizers. They include experience reports on using OpenMP (sometimes in conjunction with proposed extensions) in large-scale applications and on several computing platforms, considerations of OpenMP parallelization strategies, and discussions and evaluations of several proposed language features and compiler and tools technologies. I would like to thank the members of the Program Committee for their efforts in reviewing the submissions and in identifying a variety of excellent speakers for the remainder of the program. Thanks go also to those who gave tutorials and provided software at the accompanying events. I would also like to thank the

members of the Local Organizing Committee, who not only helped prepare for this event but also supported the OMPlab by installing software and providing technical support on a variety of platforms. Last, but not least, I would like to thank our sponsors, who helped make this an enjoyable and memorable occasion.

October 2004

Barbara Chapman

Organization

WOMPAT 2004 was organized by cOMPunity Inc., the Association of OpenMP Researchers, Developers and Users, in conjunction with the Department of Computer Science and the Texas Learning and Computation Center, TLC2, at the University of Houston.

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