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OpenMP in a Heterogeneous World

8th International Workshop on OpenMP, IWOMP 2012
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Proceedings

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Preface

OpenMP is a widely accepted, standard application programming interface (API) for high-level shared-memory parallel programming in Fortran, C, and C++. Since its introduction in 1997, OpenMP has gained support from most high-performance compiler and hardware vendors. Under the direction of the OpenMP Architecture Review Board (ARB), the OpenMP specification has evolved, reaching the recent release of Specification 3.1. Heterogeneous systems, where conventional CPUs are combined with one or more many-core accelerators, are raising new interest in directive-based approaches to parallel programming, like OpenMP. The appealing computing power offered by heterogeneous hardware makes the old problem of software portability even more complicated. Code porting can no longer be restricted to making computing intensive routines suitable for a given architecture. Since architectural diversity is now built into heterogeneous systems themselves, to fully exploit their computing power, one single application may need to contain two or more versions of the same code section, suited for different subsystems. This year, the IWOMP conference took its title from the important role that OpenMP can play in helping programmers to generalize the design of their codes, so that it can be mapped onto accelerators or conventional CPUs, leaving the low-level parallelization work to the compiler.

The community of OpenMP researchers and developers in academia and industry is united under cOMPunity (www.compunity.org). This organization has held workshops on OpenMP around the world since 1999: the European Workshop on OpenMP (EWOMP), the North American Workshop on OpenMP Applications and Tools (WOMPAT), and the Asian Workshop on OpenMP Experiences and Implementation (WOMPEI) attracted annual audiences from academia and industry. The International Workshop on OpenMP (IWOMP) consolidated these three workshop series into a single annual international event that rotates across the previous workshop sites. The first IWOMP meeting was held in 2005, in Eugene, Oregon, USA. Since then, meetings have been held each year, in Reims, France, Beijing, China, West Lafayette, USA, Dresden, Germany, Tsukuba, Japan, and Chicago, USA. Each workshop has drawn participants from research and industry throughout the world. IWOMP 2012 continued the series with technical papers, tutorials, and OpenMP status reports. Furthermore, to stress the importance of the research activities in the field of compilers, runtime systems, and tools as a driving force for the OpenMP evolution, IWOMP traditionally hosts one of the meetings of the language committee. The first IWOMP workshop was organized under the auspices of cOMPunity, and thereafter, the IWOMP Steering Committee took care of organizing and expanding this series of events. The success of the IWOMP meetings is mostly due to the generous support from numerous sponsors.

The cOMPunity website (www.compunity.org) provides access to all presentations proposed during the meetings and to a photo gallery of the events. Information about the latest conference can be found on the IWOMP website at www.iwomp.org. This book contains the proceedings of the 8th International Workshop on OpenMP which was held in Rome in June 2012, where 18 technical papers and 7 posters were presented out of more than 30 works submitted to the call for papers. The workshop program also included a tutorial day and the keynote talk of Bjarne Stroustrup, the creator and developer of the C++ programming language.

The interest shown this year again in the IWOMP conference witnesses the strength, the maturity, and the diffusion of the portable, scalable model defined by OpenMP, and confirms the critical role played by this series of events in the development of the specification and its adoption.

June 2012

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