Editorial
Programming Models, Languages, and Compilers for Manycore and Heterogeneous Architectures

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Aim and Scope. Hardware is emerging rapidly, core count is increasing, and systems consist of large cluster of nodes. These nodes are becoming more heterogeneous, that is, multicore CPUs attached to accelerators meant to address specific needs of specific computations. The type of parallelism each accelerator offers is quite different from the other. On the other hand, software for such emerging parallel and heterogeneous computing systems is still catching up. The gap between hardware and software is growing; it is a challenge for the software developers to keep up with the hardware advancements. Thus, there is an urgent need to develop and maintain sophisticated software that can not only offer performance productive solutions but also be applicable to a wide range of hardware systems. Some of the promising and widely used programming solutions include directive-based programming models such as OpenMP, vendor-specific programming models such as NVIDIA’s CUDA, OpenCL, and recently emerging programming model, OpenACC. This special issue publishes papers on the evaluations of these models for parallel computing with respect to several factors including locality-aware scheduling, data transfer optimizations, SIMD vectorization on Phi coprocessors, and programming multi-GPU.

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