Topic 10
Parallel Programming: Models, Methods, and Programming Languages

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This topic deals with advances in algorithmic and programming models, design methods, languages, and interfaces which are needed to produce correct, portable parallel software with predictable performance on different parallel and distributed architectures.

Of the 22 papers submitted to this topic, 11 have been accepted as regular and one as distinguished. Two papers delegated from other topics could not be accepted due to the high quality standards of this topic.

The topic has been divided into four sessions of three talks each:

1. **Concurrent programming languages**
   They are dealing with communication mechanisms like channels in Eden (Haskell) and Concurrent ML, or multiple-way receives in the Java extension JR.
2. **Functional programming methods and cost models**
   Functional techniques are applied in the skeleton approaches of the distinguished paper of Double Scan and of tree skeletons, as well as for a kind of parallel composition in BSP/OCaml.
3. **Systems and enviroments**
   This session presents Java-based grid systems, a software solution for distributed shared memory and an environment for structured parallel programming.
4. **Nondeterminism and analytical cost models**
   Nondeterminism is addressed by order sensitive computations in Parallel Prolog and by an API for highly-irregular computations in C++. One paper discusses the relation between theoretical and practical performance analysis.

The distinguished paper by Bischof, Gorlatch and Kitzelmann presents a composition of their Double-Scan skeleton (generalization of tridiagonal system solving) by blockwise combinators, which permits a parallel implementation of linear cost, i.e., cost-optimal complexity.