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Special Issue:

Dataflow Programming Models, Machines and Applications

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The current trend towards multi and many-core processors demands the use of parallel programming to fully exploit its performance potential. However, parallelization of applications remains a difficult task, requiring tuning at algorithmic level, in interactions with operating and runtime systems, in data placement, and in efficient use of hardware. A bottleneck at any level can easily negate the benefits of parallelism – thus posing a challenge to the scientific and industrial communities. Creation of models and alternatives to improve parallelism still requires heroic effort on part of programmers. The Dataflow model provides a viable alternative. It handles concurrency in a natural way, while hiding memory and synchronization latencies, which can lead to simpler and more power efficient systems.

Recent work has shown that execution models based on Dataflow can outperform systems based on conventional techniques, while providing more powerful, flexible and understandable parallel programming constructs. The focus of this special issue is to revisit Dataflow and showcase recent developments of Dataflow model in context of current and emerging multi/many-core processors.

Topics of the special issue include but are not limited to:

- Dataflow execution models and languages for parallelism exploitation
- Compilers and tools for Dataflow systems
- Hybrid Dataflow/Control-Flow systems
- Dataflow based architectures (Full Dataflow machines or execution mechanisms)
- Scheduling and Placement algorithms for Dataflow systems
- Error Detection/Recovery in Dataflow Systems
- Dataflow Parallel Applications
- Theoretical Analysis of Dataflow Systems

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Important dates:

Submission deadline:
31 Jan 2015

Tentative publication date:
Nov 2015

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State University of Rio de Janeiro, Brazil

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IET *Circuits, Devices & Systems*

IET Research Journals Dept.
Michael Faraday House
Six Hills Way
Stevenage
SG1 2AY
United Kingdom

Kruna Vukmirovic, Executive Editor (IET Research Journals)

T: +44 (0)1438 765504

E: kvukmirovic@theiet.org

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