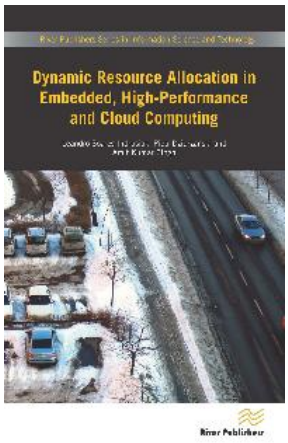
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Dynamic Resource Allocation in Embedded, High-Performance and Cloud Computing

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Description:

The availability of many-core computing platforms enables a wide variety of technical solutions for systems across the embedded, high-performance and cloud computing domains. However, large scale manycore systems are notoriously hard to optimise. Choices regarding resource allocation alone can account for wide variability in timeliness and energy dissipation (up to several orders of magnitude). *Dynamic Resource Allocation in Embedded, High-Performance and Cloud Computing* covers dynamic resource allocation heuristics for manycore systems, aiming to provide appropriate guarantees on performance and energy efficiency. It addresses different types of systems, aiming to harmonise the approaches to dynamic allocation across the complete spectrum between systems with little flexibility and strict real-time guarantees all the way to highly dynamic systems with soft performance requirements. Technical topics presented in the book include:

- Load and Resource Models
- Admission Control
- Feedback-based Allocation and Optimisation
- Search-based Allocation Heuristics
- Distributed Allocation based on Swarm Intelligence
- Value-Based Allocation

Each of the topics is illustrated with examples based on realistic computational platforms such as Network-on-Chip manycore processors, grids and private cloud environments.

Keywords: Resource allocation, scheduling, multicore, manycore, network-on-chip, real-time systems, performance predictability