**Service-Oriented Approaches for the Operation of large on-chip Networks**

**Claas Cornelius, Hendrik Bohn, Dirk Timmermann**

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**System Control for Networks-on-Chip**

**Emergence:**
- Algorithm-on-Chip
- System-on-Chip
- Network-on-Chip

Nowadays operating systems cannot simply be adopted.

**Service-Oriented Architecture (SOA)**

**Related work:**
- Centralized approach:
  - Polling of packet statistics within a separate control network [Nollet, 2004]
  - Distributed object system for hardware reconfiguration [Hecht, 2006]
  - Task mapping for QoS, no control of communication [Kavaldjieva, 2004]
- Distributed approach:
  - Configurable and modular system software [Benini, 2002]

**System monitoring / -control:**
- Dynamic, online management:
  - Task mapping, load balancing
  - Communication
  - Power consumption:
    - Temperature distribution
    - Supply voltage drop
    - Power-down modes
  - Composition of functions/tasks/services
  - Reliability, self-healing

**Different Approaches for System Control**

**Centralized:**
- Straight forward implementation
- Global system perspective
- Little hardware requirements
- Message contention
- Latency (hop count & contention)

**Distributed:**
- Hot spot avoided
- Raised number of control messages
- Redundant hardware required
- Global awareness lost
- Real-time requirements
- Multi- or broadcast messages needed

**Hierarchical:**
- A hierarchical approach could bring together the advantages of both approaches while masking their drawbacks.

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University of Rostock, Germany
Institute of Applied Microelectronics and Computer Engineering

contact: claas.cornelius@uni-rostock.de