

Distributed Systems Group

Research Areas

High Performance Computing (HPC)

- ◆ Static, Dynamic and Adaptive Scheduling
- ◆ Multi-Core and Many-Core Scheduling
- ◆ High Performance Operating Systems and VMMs
- ◆ Computational and Programming Models for HPC Workloads
- ◆ Virtual HPC Clusters
- ◆ HPC in Clouds
- ◆ HPC on Many-Core Systems
- ◆ Scalable HPC Load Manager and Job Scheduling
- ◆ Performance Portability

Exascale Computing

- ◆ Operating System Support for Exascale Computing
- ◆ Energy-Aware Exascale Computing
- ◆ Parallel Programming in Exascale Computing
- ◆ Scalable Scheduling for Many-Core systems

Cloud Computing Environment

- ◆ Virtual Machine Scheduling in Support of Cloud Computing Environments
- ◆ Resource Management at Virtual Machine Monitor Level
- ◆ Network Service Provisioning at Virtual Machine Monitor Level
- ◆ Complex Event Processing in Cloud Computing Platforms (e.g. Elasticity and Parallelism)

Operating Systems Design and Performance Evaluation

- ◆ Kernel-Level Performance Evaluation Techniques
- ◆ Kernel-Level Techniques for Improving IO Performance Workload-Aware Task Scheduling
- ◆ Cloud-Aware/Real-Time/ Energy-Aware Operating Systems
- ◆ Application of Machine Learning to Performance Diagnosis

Distributed Systems

- ◆ Distributed Computational Models in Support of New High-Performance Computing Applications
- ◆ Distributed Programming Models in Support of New Computational Models
- ◆ Practical Realizations of Computational and Programming Models of HPC Applications
- ◆ Scalable Stream Processing
- ◆ Very Large Databases
- ◆ In-Memory Column-Store Distributed Databases
- ◆ Transaction Support for Distributed Event-Based Systems

System Software Security

- ◆ Proactive Detection of Distributed Denial of Service Attacks
- ◆ Digital Money Challenges and Opportunities

Software System Dependability

- ◆ Dependability through Virtualization
- ◆ Fault Tolerant Virtualized Systems

Data Stream Processing (DSP)

- ◆ Matching Facilitation
- ◆ Moving Object Data Streams
- ◆ Scalability of Operators in Data Stream Processing Systems

Complex Event Processing (CEP)

- ◆ High Availability in Complex Event Processing Systems
- ◆ Predictive Analytics and Complex Event Processing Systems
- ◆ Uncertainty in Complex Event Processing Systems
- ◆ Scalability and Parallelism in Complex Event Processing Systems
 - Event Dispatching
 - Rule Decomposition
 - Rule Distribution
- ◆ Network Usage Optimization in Complex Event Processing Systems
- ◆ Deep Learning

Business Process Management (BPM)

- ◆ Process Mining
- ◆ Business Activity Monitoring
- ◆ Model-Execution Conformance Checking
- ◆ Model-Execution deviation Monitoring
- ◆ Process-Oriented Execution in Event-Based or Distributed Systems

Internet of Things (IoT)

- ◆ Array of Things: A Scientific Research Instrument in the Public Way