



SPECIAL SESSION 6

Scalable Artificial Intelligence and High-Performance Computing for Medicine and Engineering

Session description :

With the growing complexity of computational problems in scientific and industrial domains, there is an increasing need for efficient methods capable of handling large datasets and sophisticated models. Advances in computing architectures and parallel processing provide opportunities to accelerate algorithms and scale artificial intelligence (AI) and machine learning (ML) solutions.

This special session, “Scalable AI and High-Performance Computing for Medicine and Engineering”, explores advanced methods and tools for the parallel solution of large-scale computational challenges, emphasizing AI and ML applications in medicine and engineering, including predictive diagnostics, medical imaging, and complex engineering simulations.

Contributions are encouraged on the design and optimization of parallel programming models, tools, and environments, addressing performance, energy efficiency, fault tolerance, and communication overhead. Particular interest lies in scalable linear algebra operations, matrix and tensor computations, iterative solvers, and high-performance implementations on multi-core CPUs, GPUs, and heterogeneous architectures. Research on data movement optimization, memory management, and load balancing for integration into scalable AI frameworks is highly welcome.

By connecting high-performance computing (HPC) with AI, the session aims to drive the development of intelligent systems capable of solving large-scale problems in medicine and engineering.

Session chair :

- **Sirine Marrakchi**, Monastir Univ., TN

Topics of interest (not limited to) :

- Scalable AI and ML applications in medicine and engineering (predictive diagnostics, medical imaging, engineering simulations).
- Parallel and distributed computing for large-scale problem solving.
- Optimization of parallel programming models, tools, and environments.
- Performance, energy efficiency, fault tolerance, and communication overhead in HPC.
- Scalable linear algebra, matrix/tensor computations, and iterative solvers.
- High-performance implementations on multi-core CPUs, GPUs, and heterogeneous architectures.
- Data movement, memory management, and load balancing for AI frameworks.

Important Dates



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