ENABLING TECHNOLOGIES AND SIMULATION PRACTICES FOR ADVANCED SCIENTIFIC AND ENGINEERING COMPUTATION

TRACK NUMBER 1400

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Key words: High Performance Computing, Data Science, Scientific Visualization, Enabling Technologies, Software.

ABSTRACT

In the present days, since more and more powerful heterogeneous supercomputers are continuously emerging, scientists and engineers have been facing unprecedented challenges of adapting their scientific and engineering simulation codes to these massively parallel computers, aimed at solving problems involving complex physics and geometries more efficiently and accurately. This mini-symposium intends to provide a forum for attendees to exchange information, share best practices, and to keep current on the rapidly evolving information technologies impacting computational simulation, in particular, those extensively involved in the simulation process as well as in the design of a simulation code. The Mini Symposium topics cover (but are not limited to):

High-performance computing towards extreme-scale
Common functional interfaces to geometry, mesh, and other simulation data
Computational environments for advanced scientific and engineering computation
Digital prototyping techniques
Enabling software technologies
Data science in computational mechanics applications
Large-scale parallel computing techniques (including MPI, parallel and heterogeneous computing)
Mesh generation and adaptive mesh refinement techniques
Scientific visualization
Software libraries and applications to multi-scale multi-physics problems
Software techniques (such as middleware techniques) towards extreme-scale
Supporting tools in performance evaluation, visualization, verification and validation
Scientific workflows, theoretical frameworks, methodology and algorithms for Uncertainty Quantification
Potential demands of large-scale computational applications
Practices of large-scale numerical simulations
Programming models for multi-core and accelerators