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ENABLING TECHNOLOGIES AND SIMULATION PRACTICES FOR ADVANCED SCIENTIFIC AND ENGINEERING COMPUTATION

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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 Symposioum 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