MODEL ORDER REDUCTION TECHNIQUES AND APPLICATIONS

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ABSTRACT

Model Order Reduction techniques represent an advanced simulation tool for a large variety of problems of practical and fundamental interest in both industrial and research applications. Indeed, despite the noteworthy evolution of high performance computing technologies, high-dimensional and multi-parametric problems remain difficult to tackle even by advanced simulation methods. High dimensional PDEs naturally arise in many applied fields like rheology of complex fluids or quantum chemistry, and multi parametric problems are often encountered in simulation-based part design or process design, where extensive exploration of the parametric space defining the design variables is needed.

The main goal of the proposed Minisymposium is to bring together researchers involved in all application fields related to Model Order Reduction (Optimal Control Strategies, Real Time Simulation, Shape and Topology Optimization, Uncertainty Quantification, Inverse Analysis and Identification, Dynamic Data-Driven Application Systems, Augmented Reality, Data Assimilation and Machine Learning), in order to set the major lines of development for the near future

The Minisymposium will gather researchers in Engineering Sciences and Applied Mathematics related to the fields of Solid and Fluid Mechanics, Electromagnetism, Thermal Analysis, Structural Dynamics, Biomehcanics and Biomedical Engineering to bring their contributions in advanced Model Order Reduction, in order to achieve better and more robust solutions.

Contributors are invited to discuss topics of fundamental importance in Model Order Reduction, including, but not limited to, multi-physics and coupled problems, multi-scale approaches, efficient treatment of nonlinearity, advanced error estimation techniques and nonlinear dimensionality reduction techniques.