Special Issue

Machine Learning, Low-Rank Approximations and Reduced Order Modeling in Computational Mechanics

Message from the Guest Editors

The solution of engineering problems using simulation tools has reached a mature state over the past few decades. With the ever-increasing features included into the simulations, the technical challenges for simulations have increased. This is particularly true as simulations are also used to explore high-dimensional parameter spaces, to optimize designs, provide means for optimal control problems and—more recently—they are carried out on low-cost devices. The replacement of dedicated simulations by data-driven methods, by low-rank approximations and by reduced modeling strategies is an active field of research that is quickly finding its way into industrial applications for obvious reasons. Articles related to the development and the properties of methods from the fields of machine learning, tensor and low-rank approximations and reduced order modeling are welcome in this special issue. Papers connecting the different disciplines and regarding error control for surrogate models are particularly welcome. Authors are invited to upload supplementary material, e.g., software, data-sets or instructive videos complementing the research.

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