Methods for Identification/Machine Learning and Uncertainty Quantification of Reduced Order Models of Coupled Systems

organised by

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Coupled systems like fluid structure interaction pose particular challenges already in solving the forward problem, as they often require the coupling of discretisations, solution algorithms, and software. These challenges are even larger if inverse problems like identification are tackled, or if one wants to perform an uncertainty quantification or optimisation for such a system, or if it is intended to design a control algorithm to achieve some desired optimal outcome. To reduce the computational burden, in such cases reduced order models (ROMs) or proxy models, sometimes combined with machine learning --- lately often in the form of deep neural networks --- are used. For coupled systems, the use of such ROMs is even more desirable, but they are often produced for each system component separately, and the problems of coupling then transfers to these ROMs. The invited session is to bring together researchers in these fields and offer a look at the problems alluded to above, and offer vistas and perspectives at the formulation, analysis, and computational solution.