

Data-driven Reduced Simulation Models for Industrial Applications

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ABSTRACT

Modern industry has a high demand for efficiency, agility and the capability of automation. In order to meet these demands, a deep knowledge about the processes and their sensitivities to changes or perturbation is required. In the past years, numerical simulations have proven to be a powerful tool for obtaining this knowledge. Numerical simulations allowed to gain insights into even complex processes at arbitrary spatial locations and temporal instances. However, simulations of industrial applications are often computationally expensive and the computational time exceeds the process time by far.

In recent years the advances of reduced order methods—especially in context of data-driven non-intrusive methods—contributed to solving the issue of ‘knowledge’-accessibility at process time. The construction of reduced simulation models has proven to be a key strategy to tackle typical engineering problems like design, optimization or control of industrial processes. This mini-symposium will discuss not only the latest advances in data-driven ROM, but particularly their implementation and application in the context of industrial use cases and processes. Representative topics include but are not limited to:

- Non-intrusive reduced order modeling techniques
- Reduced order modeling for industrial applications
- Advances in data-driven representation of processes
- Hybrid models for industrial processes
- Application of model reduction frameworks