

IGA TECHNOLOGIES FOR DIGITAL TWINS

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MINISYMPOSIUM

This MS will have a special emphasis on enabling IGA technologies for Digital Twins, where we adopt the following definition of a Digital Twin:

A digital twin is defined as a virtual representation of a physical asset, or a process enabled through data and simulators for real-time prediction, optimization, monitoring, control, and decision-making.

Enabling methods and techniques for digital twins include, and are not restricted to, advanced numerical methods for multi-physics systems, error control, reduced order modeling, data assimilation, scientific machine learning, and uncertainty quantification. This MS is focusing on IGA technologies both for virtual (or descriptive) and predictive digital twins. Regarding virtual twins, the advantage of IGA for bridging the gap between geometric modeling and analysis is highly relevant, as it aims to drastically reduce human intervention in the simulation of the (multi-)physics behavior for a geometric model. Instead, to enable predictive twins, one may utilize Hybrid Analysis and Modeling (HAM) that combines classical PhysicsBased Methods (PBM) accelerated by means of Reduced Order Modeling (ROM) together with DataDriven Methods (DDM) based on sensor measurements analyzed by use of Machine Learning (ML). In general, this MS welcomes contributions on enabling technologies that can facilitate digital twins. Advanced applications of digital twins using IGA technologies are also welcome.