Isogeometric Analysis: Advanced Modeling and Applications with a Special Focus on Shells and Laminates

Lecture of
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Seminarraum EG

Isogeometric Analysis (IGA) is a relatively recent simulation framework originally proposed by TJR Hughes and coworkers (2005) with the aim of bridging the gap between Computational Mechanics and Computer Aided Design. In addition, thanks to the high-regularity properties of its basis functions, IGA has shown a better accuracy per degree-of-freedom and an enhanced robustness with respect to standard finite elements in a number of applications ranging from solids and structures to fluids and fluid-structure interaction.
This lecture aims at giving a brief introduction to the main concepts of IGA, then focusing on some recent advances and applications. Special attention will be given to shell structures and to the advantages that may be obtained by means of IGA (also in the context of fluid-structure interaction). The last part of the lecture will be finally devoted to a simple, accurate, and inexpensive simulation technique for laminates allowed by the unique IGA features.