UNIVERSITÀ DI PARMA

DIPARTIMENTO DI SCIENZE MATEMATICHE, FISICHE E INFORMATICHE

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COLLOQUIUM di DIPARTIMENTO

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Martedì 7 marzo 2023, ore 16:30

Plesso di Matematica, Aula A

From Geometric modeling to numerical simulation

Abstract: *Isogeometric analysis (IgA) is a quite recent but well-established paradigm for the analysis of problems governed by partial differential equations. It provides a design-through-analysis connection by exploiting a common representation model. This connection is achieved by using the functions adopted in Computer Aided Design (CAD) systems not only to describe the domain geometry, but also to represent the numerical solution of the differential problem. IgA has proved its effectiveness in several applications contexts.*

CAD software, used in industry for geometric modeling, typically describes physical domains by piecewise polynomials with tensor product structure, the so-called (tensor product) B-splines, and their rational extension, the so-called NURBS. In its original formulation, IgA is based on the same set of functions. The inherent high smoothness of B-splines/NURBS typically results in better accuracy per degree of freedom w.r.t. the more classical and well-known approaches used in numerical simulation.

In this talk we illustrate the basic ideas of the interplay between the kingdoms of modeling and analysis that are the core of IgA. We presents some applications and we discuss some possible extension of the classical formulation of IgA beyond the piecewise polynomial model.

Organizzatori : Proff. Alessandra Lunardi, Adriano Tomassini.