Einladung

Würzburger Mathematisches Kolloquium

Julius-Maximilians-Universität Würzburg ● Institut für Mathematik

Charles Dapogny

Université Grenoble Alpes, France

A Level Set Based Mesh Evolution Method for Shape and Topology Optimization

Dienstag, 17. Juni 2025 ● 14:15 Uhr

Seminarraum SE41 ● Humboldt-Bau (Emil-Fischer-Straße 41, 97074 Würzburg)

Der Vortrag wird auch als Zoom-Meeting übertragen: go.uniwue.de/ifmcolloquium-zoom

Abstract. The purpose of this presentation is to introduce a robust front-tracking method for dealing with arbitrary motions of shapes, even dramatic ones (e.g. featuring topological changes); although this method is illustrated in the particular context of shape optimization, it naturally applies to a wide range of inverse problems and reconstruction algorithms. The presented method combines two different means of representing shapes: on the one hand, they are meshed explicitly, which allows for efficient mechanical calculations by means of any standard Finite Element solver; on the other hand, they are represented by means of the Level Set Method, a format under which it is easy to track their evolution. The cornerstone of our method is a pair of efficient algorithms for switching from one of these representations to the other. Several numerical examples are discussed in two and three space dimensions, in the 'classical' physical setting of linear elastic structures, but also in more involved situations involving e.g. fluid-structure interactions. This is a joint work with G. Allaire, F. Feppon and P. Frey.

https://www.mathematik.uni-wuerzburg.de/de/aktuelles/kolloquium

Alle sind herzlich eingeladen.

Die Dozentinnen und Dozenten der Mathematik