In Computer Aided Design (CAD), the representation of geometrical entities by means of NURBS has become a standard. Thereby, complex domains may be described in a unified framework up to any desired level of continuity. For the numerical modeling, the discretization of the domain is crucial and leads to meshes. In classical finite element analysis, these meshes are typically built by polygonal elements and are \( C^0 \)-continuous. They are thus clearly an approximation of the CAD-domain. In contrast, in isogeometric analysis (IGA), the geometry and approximation are based on NURBS. That is, NURBS are also used in order to construct conforming finite element spaces with unique properties. Many successful and well-known concepts from classical finite element analysis, such as for example \( h \)- and \( p \)-refinement, extend also to NURBS.
In the last years, Isogeometric Analysis (IGA) has attracted the attention of numerous researchers in science and industry and promises to have significant impact in the computational engineering community. This seminar is designed for graduate and doctoral students as well as developers from industry.

**Dates**
- Start of online registration: 1 May, 2010
- End of online registration: 15 September, 2010
- Deadline for payment: 1 October, 2010
- IGA seminar: 30 Sep - 01 October, 2010

**Fee**
- graduate/doctoral students: 240 €
- post-docs/professors: 350 €
- industry: 500 €

The fee covers the comprehensive printed course material and documented MATLAB sources from the tutorials.

**Language**
The language of instruction (English or German) will be chosen in accordance with the audience’s preferences.

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Thursday, 30 September 2010

08:30 - 10:00 Basics of splines
10:30 - 12:00 NURBS
13:30 - 15:00 Tutorial A
15:30 - 17:00 Basics of IGA
19:30 Social event

**Friday, 01 October 2010**

08:30 - 10:00 Implementation of IGA
10:30 - 12:00 IGA for Linear Elastostatics
13:30 - 15:00 Tutorial B
15:30 - 17:00 IGA for Linear Elastodynamics

Dr.-Ing. Thomas-Peter Fries
RWTH Aachen University,
Chair for Computational Analysis of Technical Systems (CATS)

Dr. Ing. Thomas-Peter Fries studied at the Technical University of Braunschweig in Germany under supervision of Prof. Hermann G. Matthies. In his dissertation, he develops a coupled meshfree/meshbased method for complex fluid-structure interaction problems. Dr. Fries was a post-doctoral fellow at the Northwestern University in Chicago, USA, in the research group of Prof. Ted Belytschko. Since October 2006, Dr. Fries is head of an independent junior research group with the title “Numerical methods for discontinuities in continuum mechanics”. The project is funded by the Emmy-Noether program of the German Research Association (DFG).

Prof. Dr.-Ing. Andreas Zilian
Technische Universität Braunschweig,
Institute for Structural Analysis

Since 2006, Andreas Zilian holds an assistant professor position (Juniorprofessor) and is head of the research group “Fluid-structure-interaction” at the Institute for Structural Analysis of the Technische Universität Braunschweig. The development of enriched finite element technologies for simulation of multi-physics problems is one of his research focuses. His group investigates efficient descriptions of transient discontinuities in a level-set context and the realization of the XFEM-concept in the framework of space-time finite element methods in application to fluid-structure interaction in engineering.

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www.isogeometric.rwth-aachen.de