



## **Professor Martin Ruess**

See:

<http://scholar.google.com/citations?user=FoIWnhUAAAAJ&hl=en>

Aerospace Structures & Computational Mechanics

Delft University of Technology, Kluyverweg 1 (building 62), 2629 HS Delft, The Netherlands

### **Text by Dr. Martin Ruess:**

My research focus is on SIMulation Controlled Engineering Design (simced) in the framework of isogeometric and higher order fictitious domain methods. In particular, the weak enforcement of boundary conditions and coupling constraints are current topics which we further explore to facilitate the simulation of industry relevant structures.

Composite materials is a field of interest where we focus on a blend of mathematical models to optimize the analysis/simulation for an increased accuracy and computational efficiency, where we test and numerically predict the buckling behavior of laminated composite structures and where we optimize structures with regard to lay-up and geometry for a reduced delamination sensitivity.

The mechanics of human bones, in particular the numerical prediction of the elasticity and crack behavior of patient-specific femur bones, has been part of my research since several years, a field which profits from our development of a high-order fictitious domain method for voxel models and that aims for e.g. a reliable prognosis of crack failure and osteoporosis.

### **Research Fields/Interests:**

**Computational Mechanics:**

- Isogeometric Methods
- h-/p-version of the Finite Element Method
- High-order fictitious domain methods
- Geometrical nonlinearities
- Composite Structures

**Computational Science and Engineering:**

- Computational Steering
- Bone-/Biomechanics
- Numerical Simulation