

Term Project – Semesterarbeit

(Computational Science & Engineering)

Supervisor: Prof. Dr. Ch. Schwab (SAM, D-MATH)

Discontinuous Galerkin FEM in 3D

Project description:

FEM and especially high order FEM are some of the best known methods to numerically solve differential equations and are extensively used in many engineering applications. Simulations in 3D are still very challenging for real world models due to high computational costs. Moreover, 3D finite elements are difficult to implement due to conformity requirements. Non-conforming FEM discretisations, like discontinuous Galerkin FEM (DG-FEM), offer easier implementations due to discontinuities in their basis functions. The discontinuities are then penalised by introducing appropriate penalty terms. The task of this semester project is to implement such a high-order 3D DG-FEM into the C++-based FEM solver package Concepts.

Prerequisites: Good C/C++ skills
Basic knowledge of PDEs and FEM (e.g., NumPDE course)

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