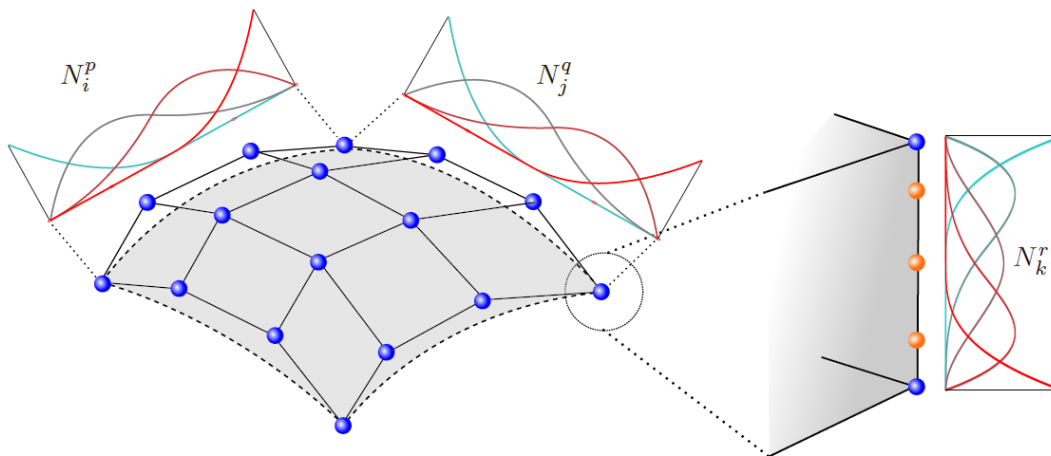


Master Thesis

Implementation of an Isogeometric Scaled Boundary Shell Formulation

State of the Art

Shell formulations are established in the numerical simulation field as an efficient alternative to model thin walled structures. By this means, 3D structures are computed with 2D shape functions which interpolate shell displacements and rotations. However, this concept is generally limited to simple stress and strain distributions over the thickness of the shell. In order to handle strain and stress states of higher complexity, the formulation can be extended by the Scaled Boundary Method. The approach is based on the parametrization of the shell thickness which enables the formulation of appropriate functions for the numerical solution in thickness direction. Furthermore, NURBS functions known from CAD are considered for the discretization of the geometry and solution fields. This concept is known in literature as Isogeometric Analysis.



Aim

The thesis aims at the numerical implementation of a shell formulation under the consideration of the Scaled Boundary Method and Isogeometric Analysis. The main task consists in programming the shell element with FORTRAN. Furthermore, the implementation will be tested with standard benchmarks with the academic finite element software FEAP.

Contact