Software Lab:

Trimmed Isogeometric Elements for an Acoustic Boundary Element Method

Setting

An Acoustic BEM requires the surface of the computation domain, hereby the geometries that are available in a CAD software are defined by Spline patches that trim each other. In this procedure one geometry can be subtracted from another one. For the design engineer the trimming is a simple approach to build complex structures, but for the computational engineer this approach introduces some challenges, especially, for the numerical integration on isogeometric elements.

Different techniques are available to realize a transfer of trimmed surfaces from the CAD to the CAE software. One possibility is to apply an Embedding Domain Method to an Isogeometric Boundary Element Method that subdivides a regular non-trimmed patch to account for the complex structure.

Task

Implement the trimmed Isogeometric elements into an existent acoustic BEM C++ code. Therefore, you will

- Extend the mesh reader of the program to deal with trimmed CAD,
- Adapt the numerical integration on trimmed surfaces, as described by [1], to the Isogeometric BEM [2].

Supervisors

Benjamin Wassermann, Simulation in Applied Mechanics Group, benjamin.wassermann@tum.de
Sören Keuchel, Novicos GmbH, keuchel@novicos.de

References
