

TRIMMING, IMMERSED, AND NON-CONFORMING METHODS

BENJAMIN MARUSSIG^{*}, ROBIN BOUCLIER[†], MATS G. LARSON^{**},
AND ERNST RANK^{††}

^{*}Graz University of Technology

[†]ICA, INSA-Toulouse, Université de Toulouse, France

^{**}Umeå University

^{††}Technical University of Munich

ABSTRACT

Isogeometric Analysis (IGA) allows the utilization of spline-based geometric representations for performing numerical simulations. While smooth splines have proved to be an excellent tool for approximation, generating analysis-suitable spline models is still a fundamental problem. Firstly, Computer-Aided Design (CAD) geometries are usually defined by boundary representations (B-Reps). Furthermore, these B-Reps often consist of a collection of trimmed tensor-product spline surfaces that are non-watertightly connected.

Trimming, immersed, and non-conforming methods address the related numerical challenges such as deriving volumetric discretizations from B-Reps, integrating arbitrary cut elements, establishing connectivity between non-watertight surfaces, etc. Therefore, they provide crucial techniques for realizing a paramount vision of IGA - the seamless integration of design and analysis.

This mini-symposium brings together experts working in this field. Specific topics of interest include, but are not limited to:

- Simulation methods for trimmed geometries
- Global and local reparameterization techniques for trimmed geometries
- Analysis-suitable Boolean operations
- Immersed methods and related concepts, including Immersogeometric methods, CutFEM, Finite Cell, TraceFEM, etc.
- Volumetric representations (V-reps)
- Analysis-suitable smooth splines on multi-patch quad/hex meshes

Besides theoretical studies, the mini-symposium also welcomes related application-oriented contributions.