$C^1$-smooth geometrically continuous isogeometric functions on volumetric two-patch domains: dimension and basis

Katharina Birner
Johannes Kepler University, Linz/Austria
katharina.birner@jku.at

Recently, the classical notion of geometric continuity experiences intense interest, due to its novel applications in isogeometric analysis [1]. More precisely, when constructing smooth isogeometric discretizations on multi-patch geometries, one needs it to derive constructions that provide smoothness across the interfaces.

The smooth isogeometric discretizations form the space of geometrically continuous functions on multi-patch domains. We investigate the dimension and constructions of locally supported basis functions. Related results for bilinear two- and multi-patch domains were published recently [2, 3], including explicit formulas for basis functions and numerical experiments indicating optimal approximation power. These have been extended to the more general class of “analysis-suitable” $G^1$ multi-patch parameterizations [4, 5], while maintaining the optimal approximation properties.

In this talk we extend these results to the trivariate case. In particular, we focus on volumetric two-patch domains and identify classes of parameterizations that are potentially well suited for defining smooth isogeometric discretizations.

Joint work with: Bert Jüttler, Mario Kapl, Angelos Mantzaflaris.

References


