

On the construction of approximately C^1 -smooth isogeometric functions

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Recently, several approaches were investigated to couple isogeometric discretizations on multi-patch domains in order to ensure global C^1 -smoothness. These techniques are closely related to the classical notion of geometric continuity [1, 2]. Approximate geometric continuity may be useful since it increases the flexibility of the constructions. We define spaces of approximately C^1 -smooth isogeometric functions based on the jump of the gradient across the interface and using the eigenstructure of a matrix that is obtained from a suitable quadratic form. We analyze the dimension of these spaces and their refinement properties. Numerical examples demonstrate the advantages of using approximate geometric continuity.

Joint work with: Bert Jüttler

References

- [1] M. Kapl, V. Vitrih, B. Jüttler and K. Birner. Isogeometric Analysis with Geometrically Continuous Functions on Two-Patch Geometries. *Computers & Mathematics with Applications*, 70:1518–1538, 2015.
- [2] D. Groisser and J. Peters. Matched G^k -Constructions Always Yield C^k -Continuous Isogeometric Elements. *Computer Aided Geometric Design*, 34:67–72, 2015.