Geometrically Smooth Splines for IGA

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Geometrically smooth (G1) spline functions are piecewice polynomial functions defined on a mesh, that satisfy properties of differentiability across shared edges. They can be used to extend Isogeometric Analysis approaches on surfaces of arbitrary topology.

In this presentation, we consider G1 splines on quadrangular meshes with given quadratic glueing data along shared edges. We describe briefly their properties, analyse their spaces, and provide dimension formula.

Computing efficiently basis functions for these spaces is critical in the IGA approach. We investigate this problem and show how to construct efficiently such bases and how different choices of basis functions can influence output results in IGA methods. A few experimentation illustrate these developments.

Joint work with: Michelangelo Marsala, Angelos Mantzaflaris

References

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