

Local Refinement for T-Splines in 2D and 3D

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T-splines are a generalization of tensor-product B-splines to non-uniform meshes. They have been introduced as a free-form geometric technology in the Computer-Aided Design community and have therefore caught much attention in Isogeometric Analysis, particularly with regard to constructing an Adaptive Finite Element Method that directly uses data structures from CAD applications. We present an efficient adaptive refinement procedure that preserves analysis-suitability of the mesh, this is, the linear independence of the T-spline functions. We prove analysis-suitability of the overlays and boundedness of their cardinalities, nestedness of the generated T-spline spaces, and linear computational complexity of the refinement procedure in terms of the number of marked and generated mesh elements. In addition, we generalize the algorithm to the three-dimensional case.

References:

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