Mesh Refinement for the Adaptive Isogeometric Method

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We introduce a mesh refinement algorithm for the Adaptive Isogeometric Method using multivariate T-splines. We investigate linear independence of the T-splines, nestedness of the T-spline spaces, and linear complexity in the sense of a uniform upper bound on the ratio of generated and marked elements, which is crucial for a later proof of rate-optimality of the method. Altogether, this work paves the way for a provably rate-optimal Adaptive Isogeometric Method with T-splines in any space dimension.

As an outlook to future work, we outline an approach for the handling of zero knot intervals and multiple lines in the interior of the domain, which are used in CAD applications for controlling the continuity of the spline functions, and we also sketch basic ideas for the local refinement of two-dimensional meshes that do not have tensor-product structure.

References:

[1] *http://hss.ulb.uni-bonn.de/2017/4804/4804.htm*

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