A NEW PERSPECTIVE ON ADAPTIVE HIERARCHICAL B-SPLINES

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Abstract. We introduce a framework for spline spaces of hierarchical type, based on a parent-children relation, which is very convenient for the analysis as well as the implementation of adaptive isogeometric methods. This framework exploits the innate refinement by functions in the B-splines context, rather than elements or cells, which is more natural in the finite element context. Furthermore, it entails a new language to handle hierarchical spline spaces, which allows to tackle fundamental questions in a very simple manner. For example, it makes it simple to create hierarchical basis with several desired properties with a refinement procedure which has linear complexity, i.e., the resulting bases have cardinality bounded by the number of initially marked functions.

Keywords: hierarchical splines, adaptivity, linear complexity

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