

EFFICIENT RBF-PU INTERPOLATION THROUGH BLOCK-BASED DATA STRUCTURES

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ABSTRACT. We propose a new efficient interpolation tool which turns out to be extremely suitable for approximating large data sets. The Partition of Unity (PU) method is performed by blending Radial Basis Functions (RBFs) as local approximants and using locally supported weights, [3, 4]. The effectiveness of the method is improved by constructing a novel space-partitioning data structure based on a subdivision of the underlying generic domain in blocks, [1]. This approach allows us to examine only a reduced number of blocks in the search process of the nearest neighbor points, leading to an optimized searching routine. Complexity analysis highlights advantages arising from the use of the new block-based partitioning structures associated with the resulting searching routines. Numerical results and applications in biomathematics, [2], show the efficiency and the flexibility of the proposed scheme.

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