

IMPROVING THE GRAPH BASIS FUNCTION PARTITION OF UNITY METHOD

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Partion of Unity Methods (PUMs) are mesh-free interpolation techniques that enable us to reduce cost-intensive computations, when the number of scattered data is very large. PUM interpolants are given by a sum of local radial kernel approximants and weight functions, where the entire domain is decomposed into several smaller sub-domains of variable radius. Very recently PUMs were combined with a local graph basis function (GBF) approximation method in order to obtain low-cost global interpolation in an efficient way on graphs [1, 2]. However, further developments are needed in order to provide more adaptive techniques for the selection of the partitions on the graph. Here we investigate how to tailor the PUM best possibly to the underlying topology of the graph providing an efficient decomposition with overlapping communities.

References

- [1] R. Cavoretto, A. De Rossi, W. Erb, *Partition of Unity Methods for Signal Processing on Graphs*, Journal of Fourier Analysis and Applications, 27 (2021), Article number 66.
- [2] R. Cavoretto, A. De Rossi, W. Erb, *GBFPUM-A MATLAB Package for Partition of Unity Based Signal Interpolation and Approximation on Graphs*, Dolomites Res. Notes Approx., 15 (2022), pp. 25–34.