

A survey of recent results in RBF-PUM interpolation

Roberto Cavoretto

Department of Mathematics “Giuseppe Peano”, University of Torino, Italy

`roberto.cavoretto@unito.it`

The Radial Basis Function Partition of Unity Method (RBF-PUM) is an effective computational tool used to solve large interpolation and differential problems. The basic idea of PUM consists of decomposing the domain into several subdomains forming a covering of the original domain and constructing a local RBF approximant for each subdomain. In this seminar we present some recent results about efficiency [2], accuracy [4] and stability [3] of the method, showing its applicability in real-life situations [1]. All software is implemented in MATLAB and can freely be downloaded.

Joint work in collaboration with:

Alessandra De Rossi, Ezio Venturino (University of Torino, Italy);

Stefano De Marchi, Emma Perracchione (University of Padova, Italy);

Gabriele Santin (University of Stuttgart, Germany).

References

- [1] R. Cavoretto, A. De Rossi, E. Perracchione, E. Venturino, Robust approximation algorithms for the detection of attraction basins in dynamical systems, *J. Sci. Comput.* 68 (2016), 395–415.
- [2] R. Cavoretto, A. De Rossi, E. Perracchione, Efficient computation of partition of unity interpolants through a block-based searching technique, *Comput. Math. Appl.* 71 (2016), 2568–2584.
- [3] R. Cavoretto, S. De Marchi, A. De Rossi, E. Perracchione, G. Santin, Partition of unity interpolation using stable kernel-based techniques, *Appl. Numer. Math.* 116 (2017), 95–107.
- [4] R. Cavoretto, A. De Rossi, E. Perracchione, Optimal selection of local approximants in RBF-PU interpolation, *J. Sci. Comput.* (2017), in press.