Rate-Optimal Sparse Approximation of Compact Break-of-Scale Embeddings

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The poster addresses the approximation problem of functions in new scales of function spaces with hybrid smoothness. In these scales we combine classical (isotropic) regularity measured in L_p with so-called dominating mixed smoothness which arises in high-dimemsional real-world applications, e.g., related to the electronic Schrödinger equation. Sharp dimension-independent rates of convergence for linear and nonlinear best approximations using n hyperbolic wavelets are presented. Important special cases include the approximation of function having dominating mixed smoothness w.r.t. L_p in the norm of the isotropic energy space H^1.

The presented results are based on a recent paper [1] which represents the first part of a long term research project.

[1] G. Byrenheid, J. Hübner, and M. Weimar. Rate-optimal sparse approximation of compact break-of-scale embeddings. Appl. Comput. Harmon. Anal. 65:40–66, 2023 (arXiv:2203.10011).

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