Adaptive near-best Quarklet Tree Approximation

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(joint work with S. Dahlke, T. Raasch and D. Vogel)

This talk is concerned with near-optimal approximation of a given function $f \in L_2([0,1])$ with elements of a polynomially enriched wavelet frame, a so-called quarklet frame. For that purpose we introduce the concepts of quarklet indices and quarklet trees. We use the underlying tree structure of the frame elements to derive an adaptive algorithm, that can be used to create approximations with an error close to the best tree approximation error for a given cardinality, as long as standard assumptions concerning the local errors are fulfilled. In connection with that some of our proofs are inspired by *hp*-approximation techniques of Binev [1]. To conclude the talk, we support our findings by numerical experiments, demonstrating, that our approach can be used to achieve inverse-exponential convergence rates. More information concerning adaptive near-best quarklet tree approximation can be found in our recent preprint [2].

References

[1] P. Binev, *Tree Approximation for hp-Adaptivity*, SIAM J. Numer. Anal. **56** (2018), no. 6, 3346-3357.

[2] S. Dahlke, M. Hovemann, T. Raasch and D. Vogel, *Adaptive Quarklet Tree Approximation*, preprint, 2023, arXiv:2301.04111.