Adaptive Residual Sub-sampling Methods for Kernel-based Interpolation

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In this talk we present an improved version of the residual sub-sampling method in [1] for adaptive interpolation by radial kernels. We introduce in the context of sub-sampling methods a maximum profile likelihood estimation criterion for the optimal choice of the kernel shape parameter [2]. This selection is completely automatic, provides reliable and accurate results for any kernel, and, unlike the original residual sub-sampling method, guarantees that the kernel interpolant exists uniquely. The performance of this new interpolation scheme is tested by numerical experiments on one and two dimensional test functions.

References

[1] T.A. Driscoll, A.R.H. Heryudono, *Adaptive residual subsampling methods for radial basis function interpolation and collocation problems*, Comput. Math. Appl., 53 (2007), pp. 927–939.

[2] G.E. Fasshauer, M.J. McCourt, *Kernel-based Approximation Methods using* MATLAB, Interdisciplinary Mathematical Sciences, Vol. 19, World Scientific Publishing Co., Singapore, 2015.