Learning anisotropy parameters for ANOVA approximation

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This paper is concerned with learning the anisotropic smoothness of a function based on scattered data. We use this smoothness information in our approximation algorithm improving the convergence rate. In particular, we use the least squares approximation with trigonometric polynomials and frequency boxes with optimized side ratio. Here the NFFT (Nonequispaced Fast Fourier Transform) is applicable to accelerate the computation time of the approximation.

We combine these findings with the truncated ANOVA (analysis of variances) decomposition. This method makes high-dimensional problems feasible. The optimal choice of frequency boxes from above occurs here multiple times for every ANOVA term. With our approach we are able to optimize hundreds of parameters in order to gain approximation accuracy with minimal overhead. Numerical experiments indicate the applicability of our results. This talk based on a joint work with Felix Bartel.

References

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