

Series kernels and their approximation properties

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Abstract

Many popular kernel functions can be expanded in series of simple basis functions. Examples of such basis functions include monomials leading to *power series kernels* [2], or wavelet-type functions leading to *multiscale kernels* [1]. The approximation properties of trial spaces built by translates of such series kernels are discussed. The focus of the talk is on the interplay between the multiscale structure of the kernel and the choice of data points. Applications of the results range from multivariate polynomial approximation to the effective numerical solution of variational problems.

This is partly based on joint works with M. Griebel, C. Rieger, and R. Schaback.

- [1] R. Opfer. Multiscale kernels. *Adv. Comp. Math.*, 25:357–380, 2006.
- [2] B. Zwicknagl. Power series kernels. *Constr. Approx.*, 29:61–84, 2009.