

Fourier transforms and smooth functional approximation.

Rolando J. Biscay Lirio

Abstract:

Approximation of functionals defined on infinite dimensional Banach spaces is a central problem in functional data analysis, in particular for nonparametric regression based on functional data. In the present work, abstract Fourier methods are developed for this purpose. On this basis, meaningful quantifications of functional smoothness are defined, and methods for smooth functional approximation are elaborated in a framework of reproducing kernel Hilbert spaces derived from suitable Fourier transforms. Theoretical results are illustrated through a variety of specific reproducing kernels.