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“Image reconstruction from scattered Radon data by weighted kernel functions”

Positive definite kernel functions are versatile tools for the solution of multivariate approximation problems. In this talk, we focus on image reconstruction from scattered Radon data by weighted kernels. To this end, we first explain key features of kernel-based interpolation schemes along with basic properties of their native reproducing kernel Hilbert spaces (RKHS). We then show how kernel-based Lagrangian interpolation can be generalized to larger classes of reconstruction problems, including those from Radon data. We finally discuss multilevel reconstruction methods by the application of greedy algorithms, to improve the numerical stability. Supporting numerical examples are presented to demonstrate the good performance of the proposed reconstruction methods.