

Tractability of linear ill-posed problems in Hilbert space

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Abstract:

In this talk, we introduce a notion of tractability for ill-posed operator equations in Hilbert space. For such operator equations the asymptotics of the best possible rate of reconstruction in terms of the underlying noise level is known in many cases. However, the relevant question is, which level of discretization, again driven by the noise level, is required in order to achieve this best possible accuracy. The proposed concept adapts the one from Information-based Complexity. Several examples indicate the relevance of this concept in the light of the curse of dimensionality. In particular, we discuss tractability aspects for the family of multivariate integration problems.