

Tractability of multivariate linear problems in the presence of noise—the worst case setting

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We consider multivariate linear problems and their tractability in the worst case setting. We investigate the relation between their tractabilities when exact information is available, and when information is contaminated by noise. Two types of noise are considered: the bounded deterministic noise, when every evaluation of a given information functional gives the same observable value being the sum of an exact evaluation and noise which bounds can be chosen; the stochastic noise, when every evaluation of a given information functional is a random variable which expected value is the exact evaluation and variance can be chosen. The tighter the bounds for the bounded deterministic noise, or the smaller the variance for the stochastic noise, the higher is the cost of a noisy evaluation of an information functional. We assume that information functionals are elements of the class Λ^{all} of all linear functionals. It turns out that in many cases a particular type of tractability holds for exact evaluations if and only if it holds when only noisy evaluations are available.

This is a joint work with Leszek Plaskota.