Adaptive approximation on cones

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Abstract

In this talk, we discuss adaptive approximation algorithms for general multivariate linear problems where the sets of input functions are non-convex cones. While it is known that adaptive algorithms perform essentially no better than non-adaptive algorithms for convex input sets, the situation may be different for non-convex sets. A typical example considered is function approximation based on series expansions. Given an error tolerance, we use series coefficients of the input to construct an approximate solution such that the error does not exceed this tolerance. We consider the situation where we can bound the norm of the input based on a pilot sample, and the situation where we keep track of the decay rate of the series coefficients of the input. Besides, presenting an error analysis, we also discuss the information cost of our algorithms and the computational complexity of our problems, and we identify conditions under which we can avoid a curse of dimensionality.