Structured Nonsmooth Optimization for Problems Arising in the Finance and Energy sectors

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Abstract

Solving real-life optimization problems often requires a trade-off between modeling and numerical tractability: the more details are brought into the model, the harder becomes the optimization problem. This is particularly true when modeling uncertainty, a crucial matter for decision makers wanting to hedge risk in the Finance and Energy sectors.

For such problems, nonsmoothness is often the result of applying some decomposition technique. The most modern bundle variants, capable of dealing with on-demand accuracy oracles, can handle very efficiently large-scale stochastic programming problems.

We discuss how to exploit structural properties of nonsmooth objective functions arising in this setting, doing so in a manner that accelerates the convergence speed of bundle methods, without losing accuracy in the solution.