

Nosmooth optimization methods for chance constrained programming

Wellington de Oliveira and Wim van Ackooij

Chance constrained programming is one of the main approaches for dealing with uncertainty in optimization problems. This approach is particularly suitable whenever high uncertainty is involved and reliability is a crucial issue. Typical areas of application are, for instance, water management, finance and power generation. In each of these applications, a probabilistic constraint is used to define safety of a decision. Contrary to conventional optimization problems, chance constraints are, in general, not given explicitly. They can be non-differentiable and their evaluation may involve multidimensional numerical integration or quasi-Monte Carlo techniques. In this work we present nonsmooth optimization methods suitable for solving (convex) chance constrained optimization problems. We give some numerical results on realistic joint chance constrained energy problems, arising when dealing with robust cascaded-reservoir management.