

"Comparing Different Nonsmooth Minimization Methods and Software"

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Abstract:

In this talk we compare the numerical performance of different nonsmooth optimization methods in solving optimization problems of the form

minimize $f(x)$,

where the objective function f is supposed to be locally Lipschitz continuous. Note that no differentiability or convexity assumptions are made.

Nonsmooth optimization methods have traditionally been divided in two main groups: subgradient and bundle methods. Both of these methods have their own supporters. Usually, when making new methods and doing some numerical experiments with them, the researchers compare the method with similar methods. That is, bundle methods are compared with bundle methods and subgradient methods are compared with other subgradient methods. The aim of this study is to compare both different subgradient methods and different bundle methods, as well as some methods that lie between those two.

All the solvers tested are so-called general black box methods and, naturally, can not beat the codes designed specially for a particular class of problems (say e.g. minmax problems). However their strength is in their generality and in minimal information of the objective function needed for calculations. That is, the value of the objective function and one arbitrary subgradient (generalized gradient) at each point.

The aim of this study is not to foreground some method over the others --- it is a well known fact that different methods work well for different types of problems and none of them is good for all types of problems --- but to get some kind of insight which kind of method to select for certain types of problems.--