

# Optimality Conditions for Nonsmooth Constrained Optimization Problems

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## Abstract

Nonsmoothness arises in many practical optimization problems. We discuss as an example the stationary gas network planning, in particular mixing and propagation equations. Here, nonsmoothness can be expressed by means of  $\min(\cdot)$  and  $\max(\cdot)$ . This can be recast in so-called abs-normal form where every occurrence of nonsmoothness is expressed in terms of the absolute value function.

For the class of unconstrained nonlinear nonsmooth minimization there have recently been developed necessary as well as sufficient first- and second-order optimality conditions. We extend the theory to nonsmooth constrained optimization and discuss illustrative examples.