Institut für
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Leibniz
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Oberseminar
Numerische Mathematik und Optimierung

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Nonsmooth Optimization via Successive Abs-Linearization

Abstract:

In finite dimensions abs-linearization of a function defined by smooth elementals and abs, min, and max yields a piecewise linear continuous approximation function at a given development point. The error between this local model and the underlying piecewise smooth function is uniformly of second order in the distance to the development point. Since the local model can be evaluated in its abs-normal form by a minor extension ADOL-C, Tapenade and other algorithmic differentiation tools, this suggests the iterative solution of nonsmooth computational problems by successive abs-linearization. That applies in particular to equation solving and unconstrained or constrained optimization including complementarity constraints. We describe regularity, optimality and convexity conditions, the corresponding rates of convergence, and various algorithms for solving the inner, abs-linear problem. Finitely, we briefly discuss the extension of the approach to function spaces, where the notion "piecewise smooth" does not appear natural.

Mittwoch, 06.06.2018, 10:00 Uhr, Raum g005, Hauptgebäude der Universität