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J. Mankau
Fakultät Mathematik, Technische Universität, 01062 Dresden, Germany
jan.mankau@tu-dresden.de

F. Schuricht
Fakultät Mathematik, Technische Universität, 01062 Dresden, Germany
friedemann.schuricht@tu-dresden.de

Gradients on Sets

For a locally Lipschitz continuous function $f\colon X \to \mathbb{R}$ the generalized gradient $\partial f(x)$ of Clarke is used to develop some (set-valued) gradient on a set $A \subset X$. Existence, uniqueness and some approximation are considered for optimal descent directions on set A. The results serve as basis for nonsmooth numerical descent algorithms that can be found in subsequent papers.

Keywords: Generalized gradient, set-valued gradient, generalized directional derivative, Lipschitz continuous function, optimal descent direction.

MSC: 46T20, 47H04, 49K99, 65K10.