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$\mathcal{VU}$-decomposition derivatives for convex max-functions. (English) Zbl 0944.65069

Théra, Michel (ed.) et al., Ill-posed variational problems and regularization techniques. Proceedings of a workshop, Univ. of Trier, Germany, September 3-5, 1998. Berlin: Springer. Lect. Notes Econ. Math. Syst. 477, 167-186 (1999).

Summary: For minimizing a convex max-function f we consider, at a minimizer, a space decomposition. That is, we distinguish a subspace $\mathcal{V}$, where f's nonsmoothness is concentrated, from its orthogonal complement, $\mathcal{U}$. We characterize smooth trajectories, tangent to $\mathcal{U}$, along which f has a second-order expansion. We give conditions (weaker than typical strong second-order sufficient conditions for optimality) guaranteeing the existence of a Hessian of a related $\mathcal{U}$-Lagrangian. We also prove, under weak assumptions and for a general convex function, superlinear convergence of a conceptual algorithm for minimizing f using $\mathcal{VU}$-decomposition derivatives.

For the entire collection see [Zbl 0930.00059].

MSC:

65K05 Numerical mathematical programming methods
90C25 Convex programming

Keywords:

convex minimization problems; convex max-function; superlinear convergence; algorithm; $\mathcal{VU}$-decomposition derivatives