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On solvability and regularity of a parametrized version of optimality conditions. (English)

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Summary: We investigate a linear homotopy $F(\cdot, t)$ connecting an appropriate smooth equation $G = 0$ with Kojima's (nonsmooth) system $K = 0$ describing critical points (primal-dual) of a nonlinear optimization problem (NLP) in finite dimension.

For $t = 0$, our system may be seen e.g. as a starting system for an embedding procedure to determine a critical point to NLP. For $t \approx 1$, it may be regarded as a regularization of K. Conditions for regularity (necessary and sufficient) and solvability (sufficient) are studied. Though, formally, they can be given in a unified way, we show that their meaning differs for $t < 1$ and $t = 1$. Particularly, no MFCQ- like condition must be imposed in order to ensure regularity for $t < 1$.

MSC:

90C30 Nonlinear programming
90C31 Sensitivity, stability, parametric optimization

Keywords:

optimality condition; Kojima's system; embedding; nonsmooth equation; solvability; inverse function; Lipschitz-continuity; regularization; linear homotopy

Full Text: DOI

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