Lafhim, L.

New optimality conditions and a scalarization approach for a nonconvex semi-vectorial bilevel optimization problem. (English) Zbl 07193703

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Summary: In this paper, we are concerned with the optimistic formulation of a semivectorial bilevel optimization problem. Introducing a new scalarization technique for multiobjective programs, we transform our problem into a scalar-objective optimization problem by means of the optimal value reformulation and establish its theoretical properties. Detailed necessary conditions, to characterize local optimal solutions of the problem, were then provided, while using the weak basic CQ together with the generalized differentiation calculus of Mordukhovich. Our approach is applicable to nonconvex problems and is different from the classical scalarization techniques previously used in the literature and the conditions obtained are new.

MSC:

90C29 Multi-objective and goal programming
90C26 Nonconvex programming, global optimization
90C70 Fuzzy and other nonstochastic uncertainty mathematical programming
49K99 Optimality conditions

Cited in **1** Review

Keywords:

semivectorial bilevel optimization; weakly efficient solution; optimal value function; optimality conditions; multiobjective optimization

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