New Kuhn-Tucker sufficiency for global optimality via convexification

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Abstract

In this paper, we first establish that the Kuhn-Tucker necessary optimality condition is sufficient for global optimality of the class of convexifiable programming problems with bounds on variables for which a local minimizer is global. This result yields easily verifiable Kuhn-Tucker sufficient conditions for non-convex quadratic programs. We also present new conditions for a feasible point which satisfies the Kuhn-Tucker conditions to be a global minimizer of multi-extremal mathematical programming problems which may have local minimizers that are not global. In the multi-extremal case, the convexifiability of an augmented Lagrangian function plays a key role in deriving the result. As an application, we also derive sufficient optimality conditions for multi-extremal bivalent programming problems. Several examples are given to illustrate the significance of the results.

Author keywords

Bivalent programs; Convexifiable functions; Convexifiable programs; Kuhn-Tucker sufficient optimality; Multi-extremal problems; Quadratic programs

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