Exact penalty function method and nonconvex mathematical programming problems

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Abstract

Penalty function methods are fundamental techniques which can be used to solve optimization problems. For these methods, new results are presented in the case of solving constrained optimization problems with nonconvex functions. The main result is the equivalence between the sets of optimal solutions in the original mathematical programming problem and its associated exact penalized optimization problem, which is established under suitable generalized invexity assumption. Thus, the results known from the literature for convex optimization problems are extended for a new class of nonconvex optimization problems with generalized invex functions. The proved equivalence justifies applicability of this method for solving nonconvex optimization problems.