A global optimization method using d.c. underestimator and convex cut function for general twice-differentiable constrained NLPs

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In this paper, the deterministic global optimization method which is applicable to general NLPs composed of twice differentiable objective and constraint functions. This method guarantees convergence to a point arbitrarily close to the global optimum. The proposed method combines BB (branch-and-bound) algorithm. At the given subregion, continuous piecewise concave underestimator, difference of convex (d.c.) underestimator, of objective function is generated to obtain upper and lower bound. And convex cut function is generated for constraints when acquired lower bound is located at infeasible region. Cutting region forms hypersphere and acts one of the discarding conditions for the selected subregion. The proposed method is applied to several constrained NLP test problems.