Global Optimization in LQ Semi-infinite Programming

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Abstract

We consider a class of LQ semi-infinite programming (SIP) problems where the objective is positive quadratic and the linear infinite constraint functions continuously depend on its index variable on a compact set. It is known that, by using the dual parameterization technique, this SIP problem can be reduced to a finite nonlinear programming problem with special features. Any global solution of the nonlinear problem will give rise to the solution of the SIP problem. However, there exists no efficient method for finding the global solution of such nonlinear programming problems. In this paper, we present a method for global solution of the nonlinear programming problem. Combining this method with the dual parameterization, we obtain an efficient dual parameterization algorithm for the LQ SIP problem. Convergence results are established and several numerical examples are given to demonstrate the efficiency of the algorithm.

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