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Cheaper relaxation and better approximation for multi-ball constrained quadratic optimization and extension. (English) Zbl 07380935
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Summary: We propose a convex quadratic programming (CQP) relaxation for multi-ball constrained quadratic optimization (MB). (CQP) is shown to be equivalent to semidefinite programming relaxation in the hard case. Based on (CQP), we propose an algorithm for solving (MB), which returns a solution of (MB) with an approximation bound independent of the number of constraints. The approximation algorithm is further extended to solve nonconvex quadratic optimization with more general constraints. As an application, we propose a standard quadratic programming relaxation for finding Chebyshev center of a general convex set with a guaranteed approximation bound.

MSC:

90C20 Quadratic programming
90C22 Semidefinite programming
90C30 Nonlinear programming
90C59 Approximation methods and heuristics in mathematical programming

Keywords:

quadratic optimization; semidefinite programming; approximation algorithm; Chebyshev center

Full Text: DOI

References:

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