

# New primal-dual interior-point method for symmetric optimization

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## Abstract

We deal with different kinds of interior-point algorithms that can be used for solving linear, semidefinite and second-order cone optimization problems. These are special cases of symmetric optimization problems that can be analysed using Euclidean Jordan algebras. There are two different ways of determining search directions in the case of these algorithms. In the first approach they can be given by using kernel functions. Besides, other search directions can be obtained by applying an algebraic equivalent transformation on the centering equation of the central path. Using this method we introduce a new search direction, thus we obtain a new interior-point algorithm. The speciality of the search direction is that it can be derived from a new type of kernel function. Moreover, we prove that the algorithm finds solution in polynomial time and it has the same complexity as the currently best known interior-point methods.