

## KERNEL FUNCTION BASED INTERIOR-POINT ALGORITHMS FOR SEMIDEFINITE OPTIMIZATION

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*Abstract.* We propose a primal-dual interior-point algorithm for semidefinite optimization (SDO) based on a class of kernel functions which are both eligible and self-regular. New search directions and proximity measures are defined based on these functions. We show that the algorithm has  $\mathcal{O}(\sqrt{n} \log \frac{n}{\epsilon})$  and  $\mathcal{O}(\sqrt{n} \log n \log \frac{n}{\epsilon})$  complexity results for small- and large-update methods, respectively. These are the best known complexity results for such methods. This is the first algorithm for SDO based on this kernel function, as far as we know.

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