

# COMPLEXITY ANALYSIS OF INTERIOR POINT ALGORITHM FOR SEMIDEFINITE OPTIMIZATION BASED ON A KERNEL FUNCTION

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In this talk, we consider a primal-dual interior-point algorithm for semidefinite optimization(SDO) based on a class of kernel functions which are both eligible and self-regular. We define new search directions and proximity measures 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 currently the best known complexity results. This is the first algorithm for SDO based on this kernel function, as far as we know. And we also show the simple numerical test of this algorithm.

## REFERENCES

- [1] , *An interior-point algorithms for linear optimization based on a new barrier function*, Applied Mathematics and Computation, **218**, (2011), 386-395.
- [2] , *Self-Regularity : A new paradigm for primal-dual interior-point algorithms*, Princeton University Press, 2002.
- [3] , *A comparative study of kernel functions for primal-dual interior-point algorithms in linear optimization*, SIAM Journal on Optimization, **15**, (2004), 101-128.

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