

On the solution of large-scale SDP problems by the modified barrier method using iterative solvers (1st revision)

by Kocvara and Stingl

The revised paper has improved on its content. I particularly like the inclusion of implicit Hessian-vector multiplication which should be the standard choice when one uses an iterative solver to solve a dense linear system.

The written English of the paper still leaves much room for improvement. It seems that the authors did not pay attention to this point at all when they revise the paper. But of course, as a referee, it is not my job to correct others' English.

I have the following comments which I hope the authors would clarify.

[p.7, ln 6] " for dense data matrices and $O(m^2n + K^2n^2)$ for sparse data matrices"

Why is the complexity not $O(m^3n + K^2n^2)$?

[p.7, ln -4] " $O(m^3 + K^2n^2)$ "

Should be $O(m^3n + K^2n^2)$?

[p.16, bottom] "Fortunately, this was not observed ... minimum eigenvalue of the Hessian of the Lagrangian is bounded away from zero, even if we are close to the solution"

I do not understand how the fact that the minimum eigenvalue of the Hessian is bounded away from 0 would imply that Algorithm 1 will not encounter difficulties when trying to get higher accuracy solution to problem (1). Even if the minimum eigenvalue is bounded away from zero, the condition number of the Hessian can still be very large because of a large maximum eigenvalue (which will happen when the parameter p is close to zero).

[p.27, last paragraph of Section 6] ϵ should be ϵ ?

Here it says that $\epsilon = 10^{-4}$, but equation (11) says that ϵ is typically 10^{-7} . Which value is used in the computation? Do the authors have to adjust ϵ for different problems?