UNBOUNDED CONVEX SEMIALGEBRAIC SETS AS SPECTRAHEDRAL SHADOWS (ERRATA)

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1. Research Report

The research report "Unbounded Convex Semialgebraic Sets as Spectrahedral Shadows" can be found at the following website.

http://www1.i2r.a-star.edu.sg/~lins/files/lmi.pdf

2. Errata

06 May 2012. Tom-Lukas Kriel from the University of Konstanz pointed out a mistake to the claim that the definition given at the top of page 6 of the report is independent of the choice of the component. The following is a corrected definition of sos-concavity and quasi-concavity for homogeneous polynomials.

Let $f(x_0, x_1, ..., x_n)$ be a homogeneous polynomial and $u = (u_0, u_1, ..., u_n)$ be a point. Given an invertible $(n+1)$-by-$(n+1)$ matrix A, let $v = A^{-1}u$ and suppose v_0 is nonzero. Then, the A-dehomogenization of f at u is the polynomial $g(y_1, ..., y_n)$ which comes from substituting $y_0 = v_0$ in the polynomial $f(Ay)$. We say that a homogeneous polynomial f is sos-concave (or quasi-concave at u) if there exists some matrix A such that the A-homogenization of f at u is sos-concave (or quasi-concave at $v = A^{-1}u$).

Then, the proof of Theorem 4.3 just needs to apply the linear transformation A to $T_k \cap \bar{B}(u, \delta)$ to represent it as a spectrahedral shadow.

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