The Geometry of SDP-Exactness in Quadratic Optimization

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Consider the problem of minimizing a quadratic objective subject to quadratic equations. We study the semialgebraic region of objective functions for which this problem is solved by its semidefinite relaxation. For the Euclidean distance problem, this is a bundle of spectrahedral shadows surrounding the given variety. We characterize the algebraic boundary of this region and we derive a formula for its degree. This is joint work with Diego Cifuentes and Corey Harris.