

1137-49-4

Tim Hoheisel* (tim.hoheisel@mcgill.ca), 805 Sherbrooke St West, Room 1114, Montreal, Canada H3A 0B9, Canada, and **James V. Burke**. *Applications of the generalized matrix-fractional function.*

The generalized matrix-fractional function (GMF) is (shown to be) a support function of the graph of the function mapping a matrix to the product with its transpose intersected with an affine manifold. It establishes connections between optimal value functions for quadratic optimization problems, covariance estimation, and the nuclear norm. We present a detailed study of the convex-analytical properties of the GMF, in particular, we give a full description of its subdifferential and characterize the points of differentiability. We will show that many powerful results on Ky-Fan norms and variational Gram functions arise from infimal projections of the sum of the GMF and a closed, proper, convex function. (Received October 17, 2017)