CHARACTERIZATION AND COMPUTATION OF MATRICES OF MAXIMAL TRACE OVER ROTATIONS

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Abstract. Given a $d \times d$ matrix M, it is well known that finding a $d \times d$ rotation matrix U that maximizes the trace of UM, i.e., that makes UM a matrix of maximal trace over rotation matrices, can be achieved with a method based on the computation of the singular value decomposition (SVD) of M. We characterize $d \times d$ matrices of maximal trace over rotation matrices in terms of their eigenvalues, and for $d = 2, 3$, we identify alternative ways, other than the SVD, of computing U so that UM is of maximal trace over rotation matrices.

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