ABSTRACT

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Title: MINIMIZATION OF THE SPECTRAL RADIUS AND NORM OF A NONNEGATIVE MATRIX BY DIAGONAL EQUIVALENCE SCALING TO A MULTIPLE OF A DOUBLY STOCHASTIC MATRIX.

Abstract: Let A be a square nonnegative matrix and let $A^{\#}$ be the matrix obtained from A by deleting all elements which do not lie on a positive diagonal. Let $E(A)$ consist of all matrices of form XAY where X and Y are positive diagonal matrices such that $\det(XY) = 1$. Then the infimum of the spectral radius $\rho(B)$ for $B \in E(A)$ equals $\rho(M)$, where M is the unique matrix in $E(A^{\#})$ which is a nonnegative multiple of a doubly stochastic matrix. A similar result holds when the spectral radius is replaced by a norm belonging to a wide class of matrix norms. We show when these infima are achieved and we prove generalizations to sums of nonnegative matrices.

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