Electronic Journal of Linear Algebra ISSN 1081-3810
A publication of the International Linear Algebra Society
Volume 16, pp. 435-443, December 2007

ELA
http://math.technion.ac.il/iic/ela

BLOCK DISTANCE MATRICES*

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Abstract. In this paper, block distance matrices are introduced. Suppose F is a square block matrix in which each block is a symmetric matrix of some given order. If F is positive semidefinite, the block distance matrix D is defined as a matrix whose (i,j)-block is given by $D_{ij} = F_{ii}+F_{jj}-2F_{ij}$. When each block in F is 1×1 (i.e., a real number), D is a usual Euclidean distance matrix. Many interesting properties of Euclidean distance matrices to block distance matrices are extended in this paper. Finally, distance matrices of trees with matrix weights are investigated.

Key words. Distance matrices, Laplacian matrices, Trees.

AMS subject classifications. 51K05, 15A57.

*Received by the editors 19 February 2007. Accepted for publication 26 November 2007. Handling Editor: Raphael Loewy.

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