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Interpolation by matrices.

Electron. J. Linear Algebra 11, 281-291, electronic only (2004).

Given two sets of vectors in \mathbb{R}^n : $\{x_j\}_{j=1}^k$ and $\{y_j\}_{j=1}^k$, the author finds necessary and sufficient conditions on these sets such that the equations $Ax_j = y_j$, $j = 1, \dots, k$ have a solution $A \in \mathbb{C}^{n \times n}$ which is in a certain matrix class \mathcal{P} . A complete characterization is given in the case where \mathcal{P} is the set of positive definite, Hermitian positive definite, positive, or strictly positive matrices. In the latter two cases, the problem is considered for non-square matrices as well. Necessary conditions are obtained for the class of strictly totally positive (non-square) matrices and (square) P -matrices. These conditions are conjectured to be also sufficient.

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