

Singular Value Decomposition of a Matrix

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Abstract

Let A be an $m \times n$ complex (or real) matrix. Then there exist unitary (orthogonal) matrices U of order $m \times m$ and V of order $n \times n$ such that

$$A = U\Sigma V^* \quad (\text{or } A = U\Sigma V^T \text{ in the real case}),$$

where Σ is an $m \times n$ real diagonal matrix whose entries are the singular values of A . This factorization is called the singular value decomposition (SVD) of A . In this talk, we discuss its history, some basic properties, and applications.