

Diagram illustrating the Singular Value Decomposition (SVD) of a matrix $\mathbf{A}_{m \times n}$ where $m < n$. The matrix $\mathbf{A}_{m \times n}$ is represented by a rectangle with diagonal hatching. It is equal to the product of three matrices: $\mathbf{U}_{m \times m}$ (a rectangle with a dotted pattern), $\Sigma_{m \times n}$ (a rectangle with a diagonal band of shaded squares and a dotted pattern), and $\mathbf{V}_{n \times n}^T$ (a rectangle with a fine grid pattern).

$$\mathbf{A}_{m \times n} = \mathbf{U}_{m \times m} \times \Sigma_{m \times n} \times \mathbf{V}_{n \times n}^T$$

(a) ($m < n$)

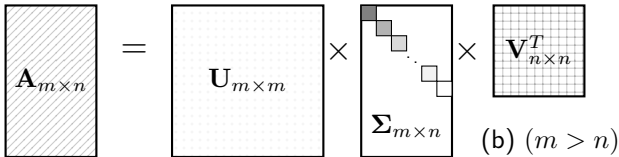


Diagram illustrating the Singular Value Decomposition (SVD) of a matrix $\mathbf{A}_{m \times n}$ where $m > n$. The matrix $\mathbf{A}_{m \times n}$ is represented by a rectangle with diagonal hatching. It is equal to the product of three matrices: $\mathbf{U}_{m \times m}$ (a rectangle with a dotted pattern), $\Sigma_{m \times n}$ (a rectangle with a diagonal band of shaded squares and a dotted pattern), and $\mathbf{V}_{n \times n}^T$ (a rectangle with a fine grid pattern).

$$\mathbf{A}_{m \times n} = \mathbf{U}_{m \times m} \times \Sigma_{m \times n} \times \mathbf{V}_{n \times n}^T$$

(b) ($m > n$)