

$$\begin{array}{c}
 (\mathbf{t}_i^T) \rightarrow \begin{bmatrix} x_{1,1} & \cdots & x_{1,n} \\ \vdots & \ddots & \vdots \\ x_{m,1} & \cdots & x_{m,n} \end{bmatrix}
 \end{array}
 \begin{array}{c}
 X \\
 (\mathbf{d}_j) \\
 \downarrow
 \end{array}
 =
 \begin{array}{c}
 (\hat{\mathbf{t}}_i^T) \rightarrow \begin{bmatrix} \boxed{\mathbf{u}_1} & \cdots & \mathbf{u}_l \end{bmatrix}
 \end{array}
 \begin{array}{c}
 U \\
 \text{"Concept weight" per term} \\
 \text{(Contribution to each term)}
 \end{array}
 \cdot
 \begin{array}{c}
 \begin{bmatrix} \sigma_1 & \cdots & 0 \\ \vdots & \ddots & \vdots \\ 0 & \cdots & \sigma_l \end{bmatrix}
 \end{array}
 \begin{array}{c}
 \Sigma \\
 \text{Singular values} \\
 \text{"concept strength"}
 \end{array}
 \cdot
 \begin{array}{c}
 \begin{bmatrix} \boxed{\mathbf{v}_1} \\ \vdots \\ \mathbf{v}_l \end{bmatrix}
 \end{array}
 \begin{array}{c}
 V^T \\
 (\hat{\mathbf{d}}_j) \\
 \downarrow \\
 \text{"Concept weight" per doc} \\
 \text{(Contribution to each doc)} \\
 \text{Decomposed doc vector}
 \end{array}$$