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What is the task of Dim-red?:

find latent factors, discover the axes of data.

evaluate dimension by the value of rank

SVD(Singular Value Decomposition)

What is Singular Value?

Definition of SV in Mathematics

The square roots.
See SV(wiki)

Important formula

$$\mathbf{A} \sim \mathbf{U} * \sum * \mathbf{V}^{\mathrm{T}}$$

A : Input data (m documents * n terms)

U : Left Singular vectors (m documnets * r concepts)

V : Right Singular vectors (n * r)

$\sum$: Singular values

understand the picture given in the slide to promote comprehension.

some properties in the above formula:

U, $\sum$, V : unique matrix;

U, V: column orthonormal

$\sum$:diagonal

What is concept?

Given in the examples, it can be features ans categories of different data.

Structure

example :

- A 7 x 5 ;
- U 7 x 3 ;
- $\sum$ 3 x 3;
- V : 3 x 5 .

Algorithm

See the slides. We may offer other materials.