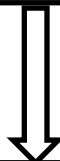


GloVe: Global Vectors for Word Representation

开始



统计共现矩阵



训练词向量



结束

For example:

Can you can a can as a canner can a can.

Tokens: can you a as canner

window size: 5

Can you can a can as a canner can a can.

Window label	Center word	Window contents
0	can	can you can
1	you	can you can a
2	can	can you can a can
3	a	you can a can as
4	can	can a can as a
5	as	a can as a canner
6	a	can as a canner can
7	canner	as a canner can a
8	can	a canner can a can
9	a	canner can a can
10	can	can a can

$$X_{as,a} += 1$$

$$X_{as,can} += 1$$

$$X_{as,canner} += 1$$

	can	you	a	as	canner
can	6	2	6	1	1
you	2	0	1	0	0
a	6	1	0	2	2
as	1	0	2	0	1
canner	1	0	2	1	0

$$X_i = \sum_{j=1}^N X_{i,j}$$

$$P_{i,k} = \frac{X_{i,k}}{X_i}$$

$$\text{ratio}_{i,j,k} = \frac{P_{i,k}}{P_{j,k}}$$

<i>ratio_{i,j,k}</i>	<i>j,k relevant</i>	<i>j,k irrelevant</i>
<i>i,k relevant</i>	≈ 1	large values
<i>i,k irrelevant</i>	small values	≈ 1

Probability and Ratio	k = can	k = you	k = a	k = as	k = canner
$P(k a)$	0.545	0.091	0	0.182	0.182
$P(k can)$	0.375	0.125	0.375	0.0625	0.0625
$P(k a)/P(k can)$	1.453	0.728	0	2.912	2.912

Probability and Ratio	<i>k = solid</i>	<i>k = gas</i>	<i>k = water</i>	<i>k = fashion</i>
$P(k ice)$	1.9×10^{-4}	6.6×10^{-5}	3.0×10^{-3}	1.7×10^{-5}
$P(k steam)$	2.2×10^{-5}	7.8×10^{-4}	2.2×10^{-3}	1.8×10^{-5}
$P(k ice)/P(k steam)$	8.9	8.5×10^{-2}	1.36	0.96

$$J = \sum_{i,j}^N f(X_{i,j}) (v_i^T v_j + b_i + b_j - \log(X_{i,j}))^2$$

$$f(x) = \begin{cases} (x/x_{max})^{0.75}, & \text{if } x < x_{max} \\ 1, & \text{if } x \geq x_{max} \end{cases}$$

Reference

1. GloVe: Global Vectors for Word Representation

<https://nlp.stanford.edu/pubs/glove.pdf> paper

2. GloVe: Global Vectors for Word Representation

<https://nlp.stanford.edu/projects/glove/> code

3. 理解GloVe模型 (Global vectors for word representation)

<https://blog.csdn.net/codertc/article/details/73864097>