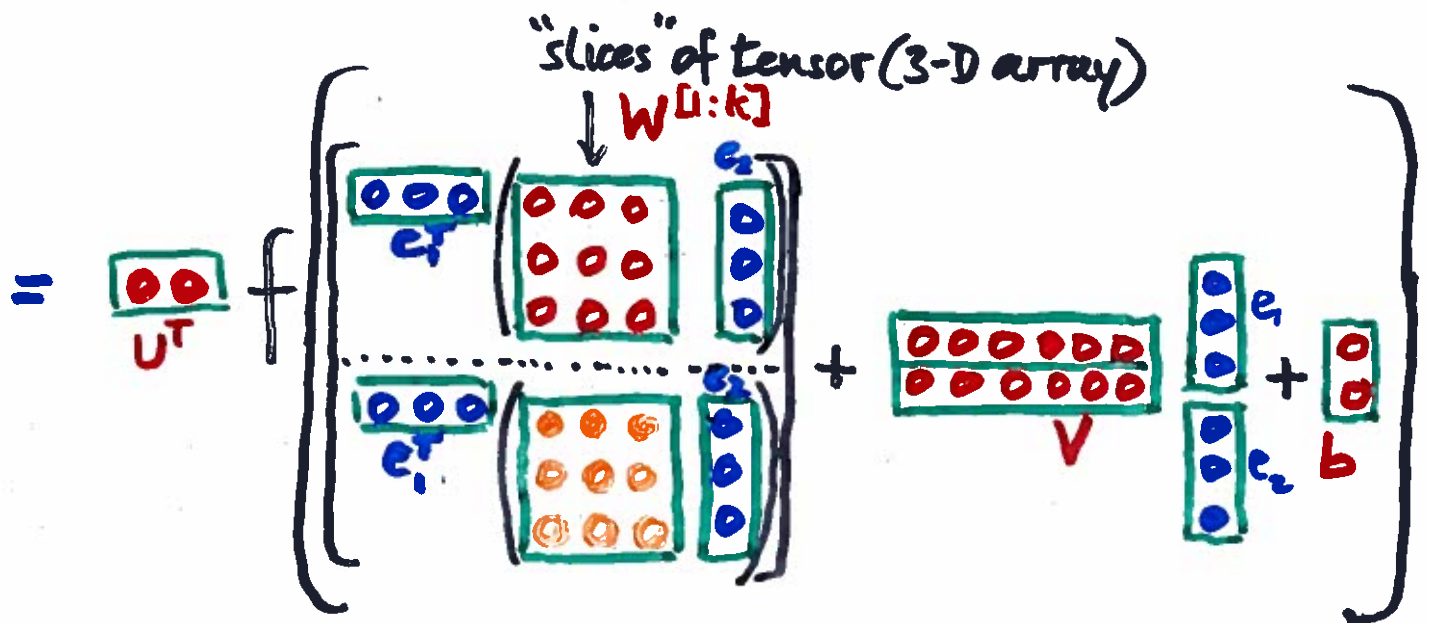


Socher et al. - Reasoning with tensor networks

$$g(e_1, R, e_2) = u^T f\left(e_1^T W^{[1:k]} e_2 + V \begin{bmatrix} e_1 \\ e_2 \end{bmatrix} + b\right)$$



$|e_1| = |e_2| = d$ (here, 3, in practice 100)

depth of weight array $W^{[1:k]} = k$ (here 2, in practice 4)

e.g., relation $R = \text{nationality}$, instance

(Pablo Picasso, nationality, Spain)

e_1 co-occurrence
vector

e_2 co-occurrence
vector

Can infer this from Freebase Triples (has nearly 2×10^9)

About 90% correct on held-out test (non) examples.

Basically, this is **similarity inference (analogy)**