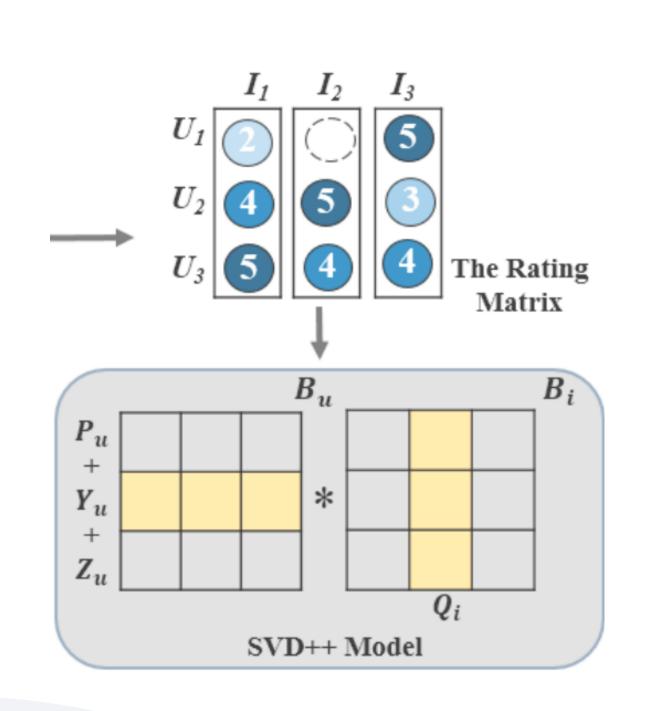
## Dual auto-encoders and obj2vec



Neural networks can be used to learn patterns and then reconstruct them. This has been used to learn the latent factors of the rating matrix

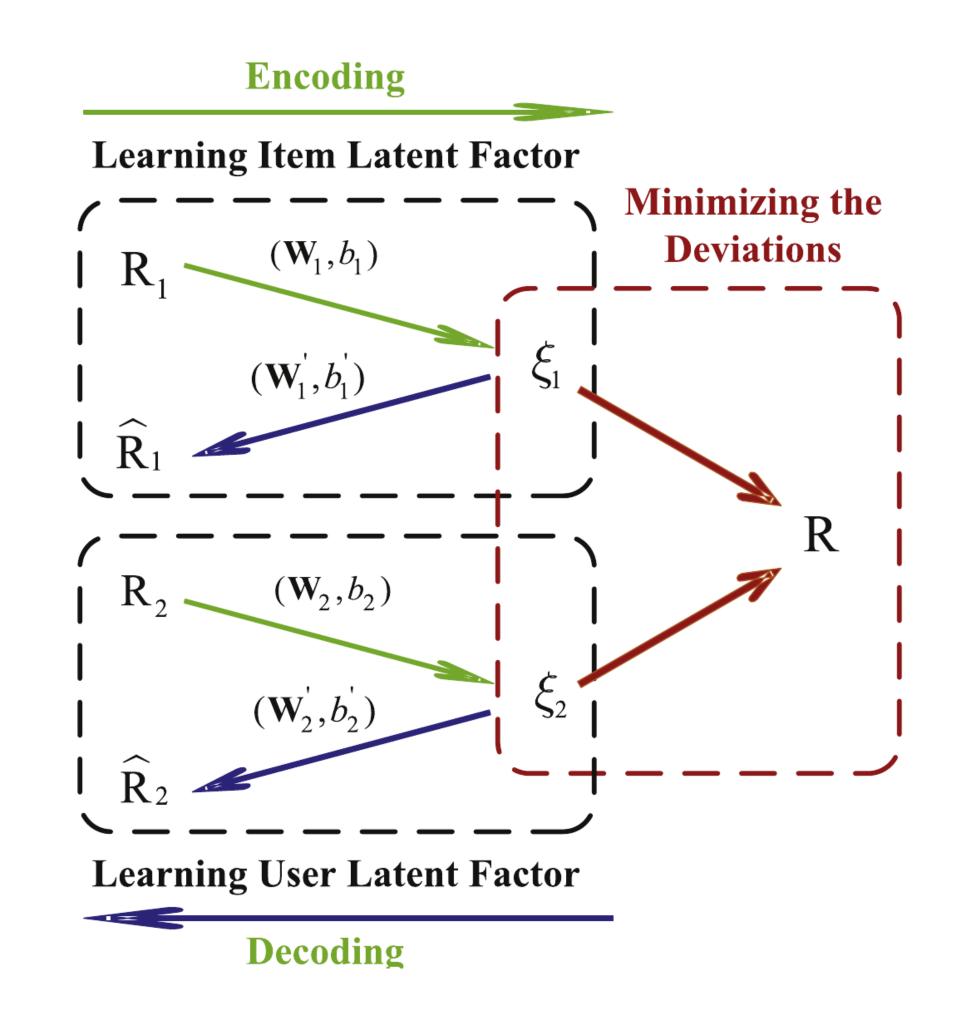


Instead of matrices we use lists (user<sub>10</sub>, cause<sub>456</sub>, rating<sub>10, 456</sub>) (user<sub>7620</sub>, cause<sub>804</sub>, rating<sub>7620, 804</sub>) (user<sub>926</sub>, cause<sub>125</sub>, rating<sub>926, 125</sub>)

And the auto-encoder builds the embedding matrices:

 $\xi_1$  and  $\xi_2$ 

Where the equivalent to UV matrix decomposition would have been:  $R_1 \approx B_u$  (The features are the items)  $R_2 \approx B_i$  (The features are the users)



Zhuang, Fuzhen, Zhang, Zhiqiang, Qian, Mingda, Shi, Chuan, Xie, Xing, and He, Qing. "Representation Learning via Dual-Autoencoder for Recommendation." Neural Networks 90 (2017): 83-89. Web.