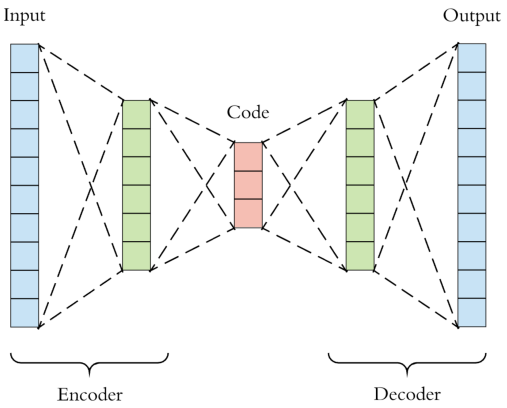
Autoencoders for Collaborative Filtering[2]

Prediction $\hat{x}_{ui} = h(\mathbf{x}_u, \boldsymbol{\theta})$



Training Objective

Reconstruction/Prediction Error or ELBO

Pros & Cons

- \+ Non-Linear ranking
- \+ No negative sampling needed
- – Lack of interpretability
- – No automatic discovery of user-user item-item similarities
- – Predictions over *all* users or items $\Theta(\min|U|, |I|)$
- – LSH or MIPS not possible

Major Challenge: Sparsity of inputs/gradients

- Item-based RS
- Dense re-feeding: $h(h(\mathbf{x})) = h(\mathbf{x})$

[2] "Autorec: Autoencoders meet collaborative filtering." S Sedhain, A K M, S Sanner, L Xie
"Collaborative filtering with stacked denoising autoencoders and sparse inputs.", F Strub, M Jeremie
"Training deep autoencoders for collaborative filtering", O Kuchaiev, B Ginsburg
"Variational autoencoders for collaborative filtering", D Liang, R G Krishnan, M D Hoffman, T Jebara