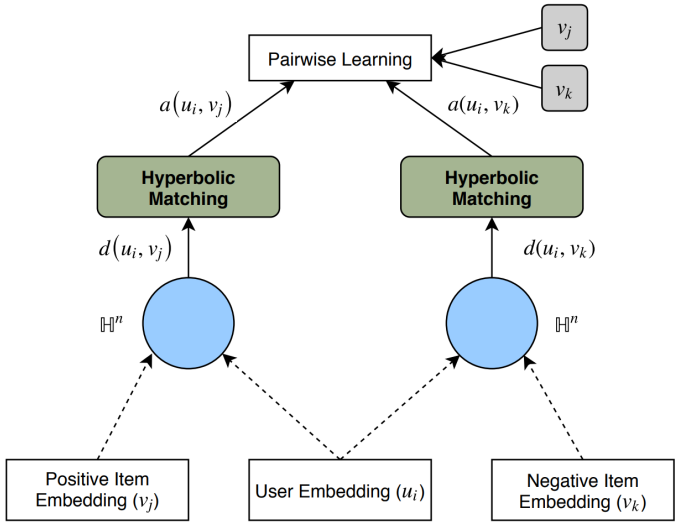
Hyperbolic Recommender Systems (2/2)

Prediction

$$\hat{x}_{ui} = -\alpha d(\mathbf{x}_u, \mathbf{x}_i), \quad \alpha > 0.$$



Pros & Cons

- \+ *Similarity propagation*
- \+ Interpretability
- \+ LSH possible
- – Prediction power depends on suitability of geometry

Training Objective (BPR)

$$\mathcal{L}(\boldsymbol{\theta}) = \sum_{(u,i,j)\in\mathcal{D}} -\log\left(\sigma\left(\alpha\left(d(\mathbf{x}_u, \mathbf{x}_j) - d(\mathbf{x}_u, \mathbf{x}_i)\right)\right)\right),$$