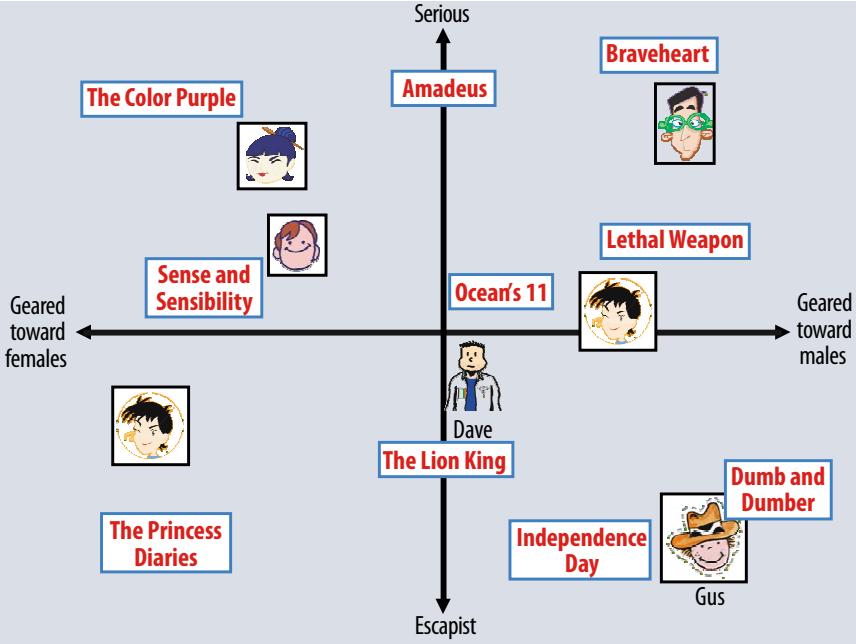
Matrix Factorization (MF)

Prediction

$$\hat{x}_{u,i} = \langle \mathbf{x}_u, \mathbf{x}_i \rangle + \mu_u + \mu_i + \mu$$

Training Objective

Squared Loss or BPR Loss



Pros & Cons

- \+ Fast & efficient predictions tailored to user's tastes
- \+ Well-established model with lots of extensions (ALS, time incorporation, online algs., Non-neg. MF, ...)
- \+ Interpretability
- \+ Usable with MIPS
- – Fails to learn user-user and item-item similarities
- – Prediction is only a bi-linear

Image Source: "Matrix factorization techniques for recommender systems" Y Koren, R Bell, C Volinsky