Summer Research

Single Cell RNA-seq

Transcripts Expression Matrix

Columns = Cells

Rows = Transcripts

Netflix Example

Movie/User - preferences

Columns = users

Rows = movies (all movies inside of Netflix)

Netflix user problem –

Each user gives a movie a rating

Collaborative filtering – can you fill in missing entries from the matrix

Ie: if two users are similar, estimate the missing movie likelihood

Low rank matrix / Machine learning

**Problems**

**1. missing entries**

**2. huge errors/outliers**

**3. noise**

Similar problem with single cell matrix

Figure out false negatives for expression matrix

**Areas**

1. collaborative filtering

2. matrix completion

minimize || A – (M + s) || s.t. M\_{I,j} = 0

distinguish between false positive 0 and truly 0 expressed

Given: Similar cell columns

Dropouts – false negatives things to correct

# Problem 2