

Recommender Response to Diversity and Popularity Bias in User Profiles

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<https://goo.gl/bWkTS9>



GOAL

Understand how common recommender algorithms respond to and propagate features of users' input profiles.

RESEARCH QUESTIONS

1. Does the user's input profile diversity or popularity change the recommender response profile?
2. Do different recommender algorithms propagate changes in users' input profile diversity or popularity differently?
3. How does recommender accuracy correlate with users' profile diversity or popularity?

DATA AND METHODS

- MovieLens 10M ratings + Tag Genome
- Took 5 disjoint samples of 1000 users
- Select 5 ratings for each as test ratings for accuracy
- Generate 100-item lists, prune to 10 and 25 items
- Measure user input profile & each recommender's output
 - Diversity: Intra-List Similarity with Pearson correlation over tag genome vectors
 - Popularity: Mean Popularity Rank
 - Accuracy: Mean Average Precision

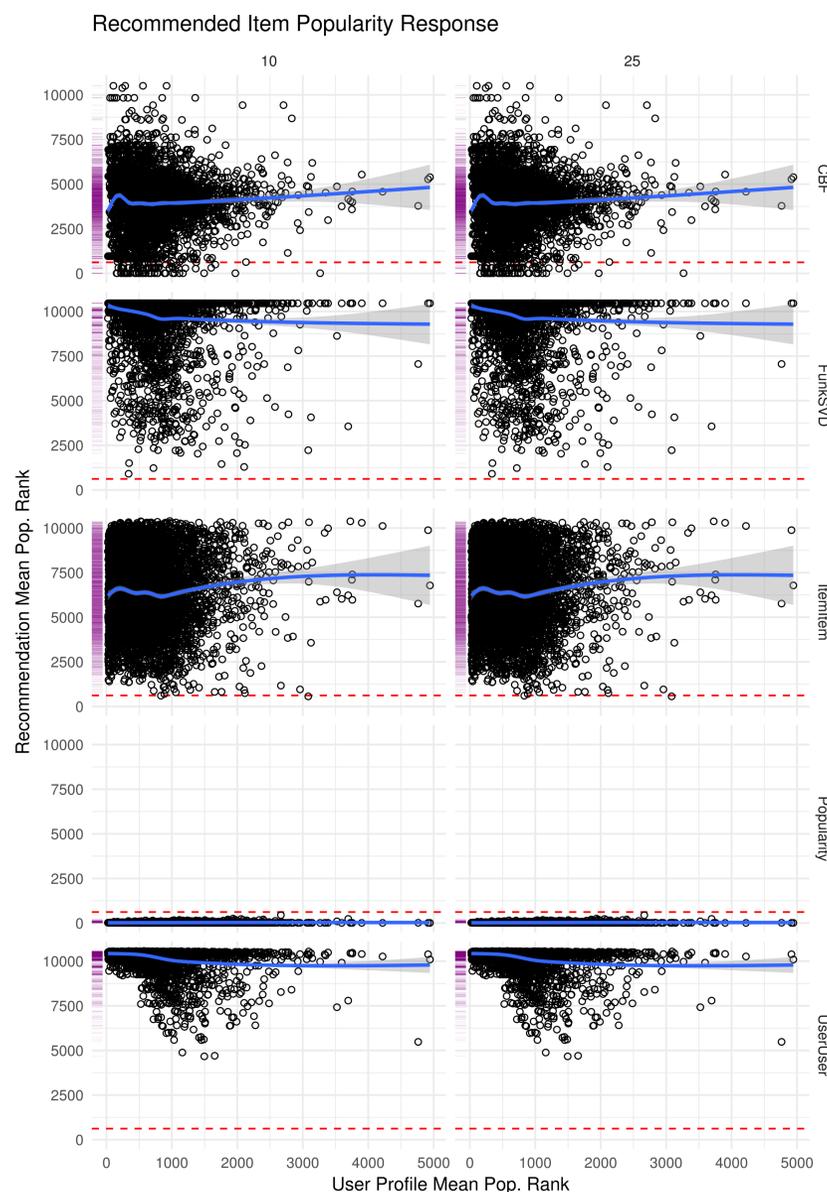
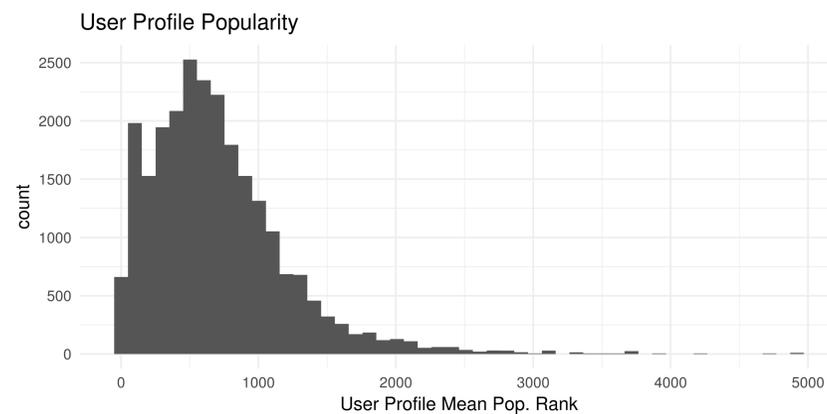
ALGORITHMS

- **User-User CF** with 30 neighbors and cosine similarity over mean-adjusted ratings
- **Item-Item CF** with 20 neighbors and cosine similarity over mean-adjusted ratings
- **FunkSVD** with 40 factors and 125 iterations per feature
- **CBF** using Lucene to find similar items based on tag applications
- **Popularity** recommending the most often-rated items

FINDINGS

- Popularity and diversity preference are not well-propagated
- CBF propagates some diversity & popularity
- Diversity & popularity had no discernible effect on accuracy

POPULARITY



DIVERSITY

