IMPROVING RECOMMENDER SYSTEM NAVIGABILITY THROUGH DIVERSIFICATION
A CASE STUDY OF IMDB

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INFORMATION

EXCHANGE

ENTERTAINMENT
Recommendations serve to:

- reduce information overload
- recommend matching items
- explore and consume content
- enable browsing
- help to discover novel content
Recommenders are evaluated mainly with accuracy measures.
Does accuracy evaluate all use cases?

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Back to the Future Part II
(1989)
PG  Adventure | Comedy | Sci-Fi

After visiting 2015, Marty McFly must repeat his visit to 1955 to prevent disastrous changes to 1985... without interfering with his first trip.

Director: Robert Zemeckis
Stars: Michael J. Fox, Christopher Ll...
Recommenders of IMDb

**Collaborative filtering (CF)** recommendations:
- based on „people who liked this also liked...“
- 169k titles

**Content-based (CB)** recommendations:
- based on title, genres, actors, etc.
- 785k titles
Recommendation networks
Recommendation networks
Recommendation networks
Recommendation networks
Recommendation networks
1. Reachability
2. Navigability
Largest network component
Largest network component
Eccentricity
Eccentricity

Collaborative Filtering

Content-based
Improvement through diversification
Improvement through diversification

1. Random
Improvement through diversification

1. Random

2. **Diversify**: minimize similarity to others
   [Ziegler et al. 2005]
Improvement through diversification

1. Random

2. **Diversify**: minimize similarity to others
   [Ziegler et al. 2005]

3. **ExpRel**: maximize neighborhood size
   [Küçüktunç et al. 2013]
Largest network component
Eccentricity

Collaborative Filtering

Content-based
1. Reachability
2. Navigability
Navigability

How well do the networks fare in browsing scenarios?
Navigability
Navigability

- Start Node
- Intermediate Node
- Target Node
- Recommendation
- Taken Path
Navigability
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Decentralized Search

**Start:** random nodes in the largest component

**Targets:** IMDb genre top lists

**Link selection:** based on TF/IDF similarity to target

We simulate around 10k missions
Navigability
Navigability

Largest Component

![Graph showing share of nodes (%) for CF and CB](image)

Found nodes for CF and CB:
- No Diversification
- ExpRel
- Diversify
- Random
Wrap-up

- IMDb does not support explorative scenarios well
- Diversification improves *navigability* & *reachability*
- CF leads to a larger component, but poorer navigability
  → *trade-off* coverage & navigability
- Implement more advanced recommendation algorithms
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[2] Ziegler et al. Improving recommendation lists through topic diversification. WWW’05