

IMPROVING RECOMMENDER SYSTEM NAVIGABILITY THROUGH DIVERSIFICATION

A CASE STUDY OF IMDB

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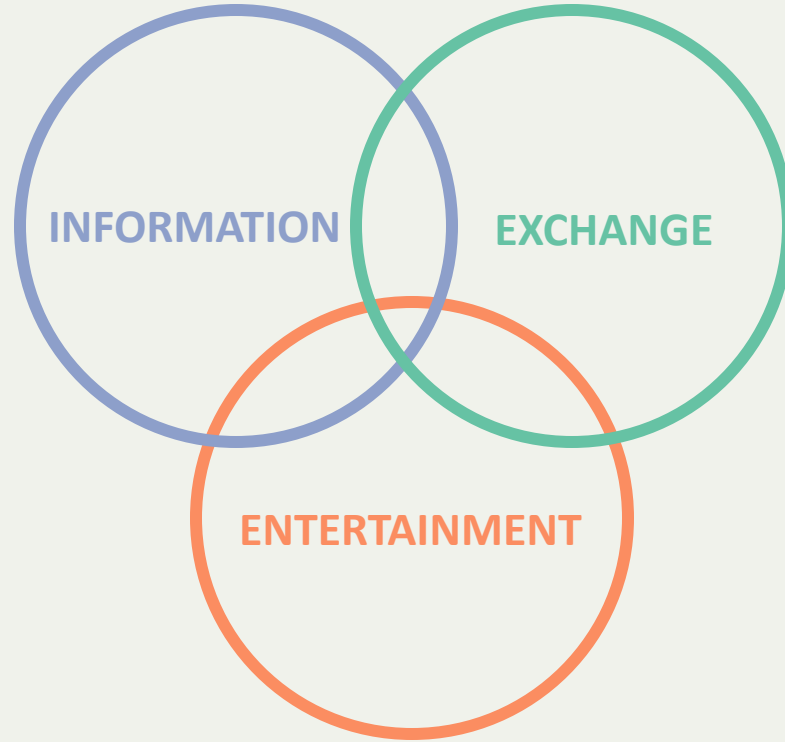
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Markus Strohmaier



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GESIS & Universität Koblenz-Landau



You  **Tube**





PSY - GANGNAM STYLE(강남스타일) M/V



officialpsy

 8,199,419

2,431,557,054

 Add to  Share  More

 9,927,214  1,363,233

Published on Jul 15, 2012

Available on iTunes @ <http://www.apple.com>

Up next



PSY - GENTLEMAN M/V

by officialpsy
883,545,767 views



Mix - PSY - GANGNAM STYLE(강남스타일) M/V

by YouTube



PSY (ft. HYUNA) - 오빤 딱 내 스타일 M/V

by officialpsy
597,442,405 views



PSY - HANGOVER (feat. Snoop Dogg) M/V

by officialpsy
220,059,416 views



PSY - Performs on 'The X-Factor Australia'

by officialpsy
19,331,300 views



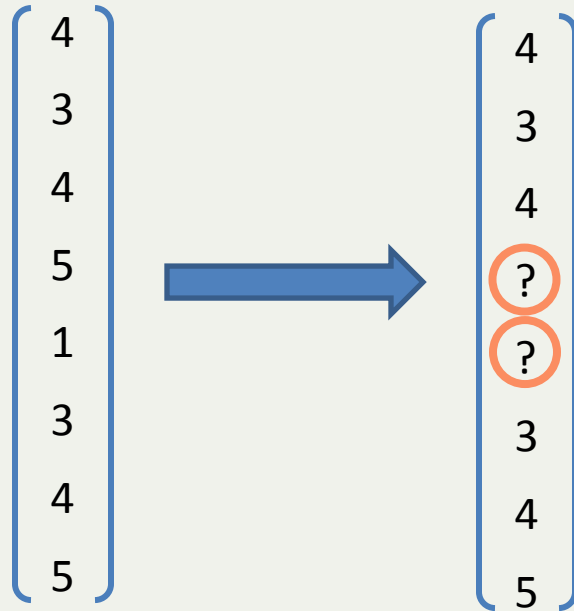
ZOMBIE PSY

by Pancadao Pika Das Galaxia
38,791,642 views

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?

reduce information overload

recommend matching items

explore and consume content

enable browsing

help to discover novel content

Does accuracy evaluate all use cases?

reduce information overload

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explore and consume content

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The logo for IMDb (Internet Movie Database) is centered on a white background. It consists of a dark gray rectangular background. Inside this background is a yellow rounded rectangle. The text "IMDb" is written in a bold, black, sans-serif font across the center of the yellow rectangle. The letters "I", "M", and "D" are in all caps, while the "b" is in lowercase.

IMDb

Back to the Future

People who liked this also liked...

[Learn more](#)



Back to the Future Part II (1989)

PG Adventure | Comedy | Sci-Fi

★★★★★★★★★★ 7,8/10

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

Add to Watchlist

Next »

Director: Robert Zemeckis
Stars: Michael J. Fox, Christopher LL...

◀ Prev 6 Next 6 ▶

Recommenders of IMDb

Collaborative filtering (CF) recommendations:

based on „people who liked this also liked...“

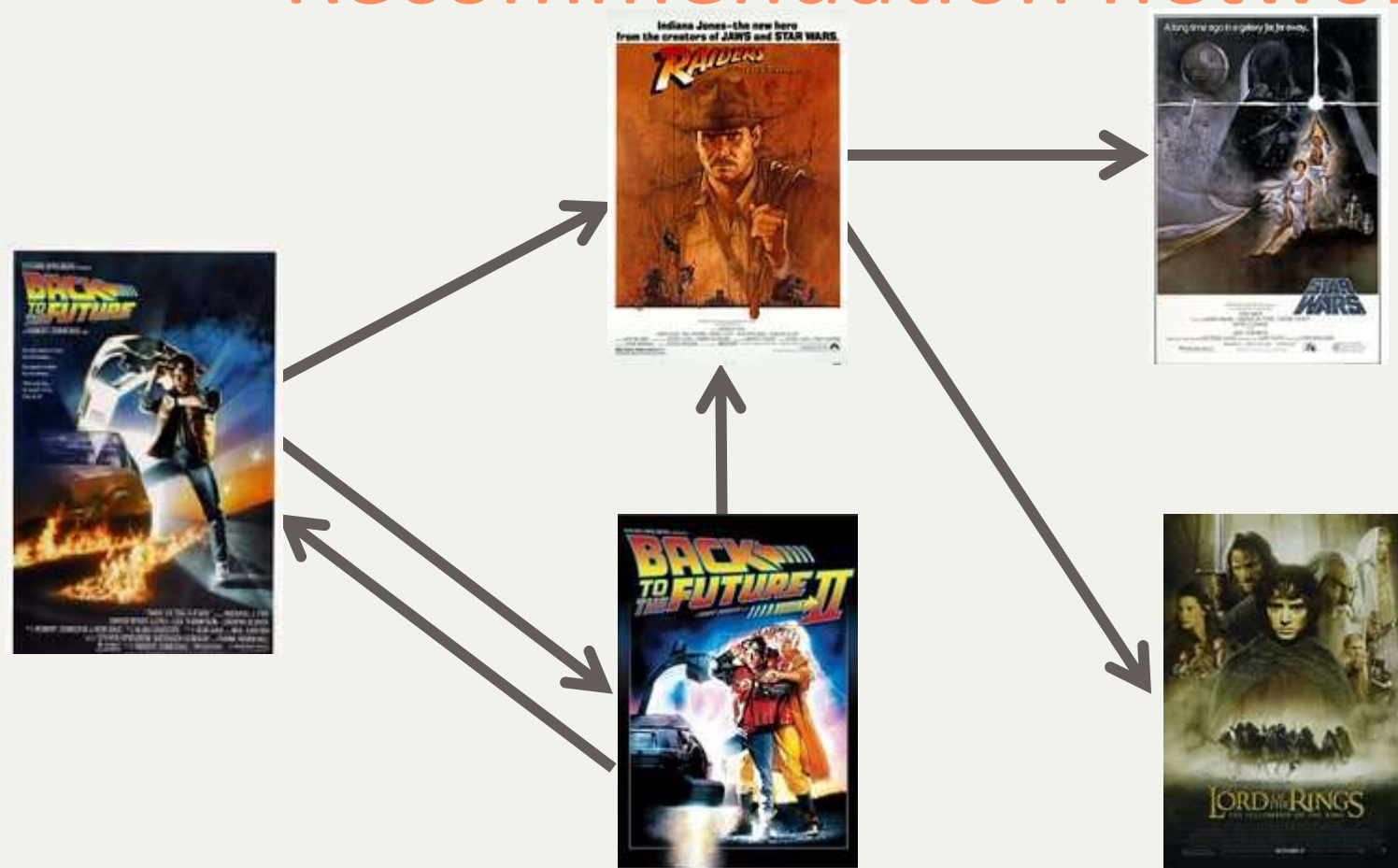
169k titles

Content-based (CB) recommendations:

based on title, genres, actors, etc.

785k titles

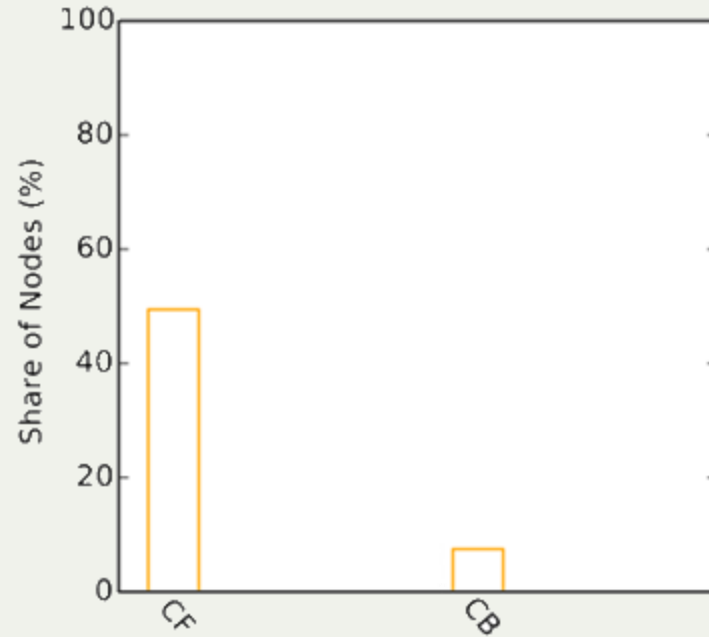
Recommendation networks



1. Reachability

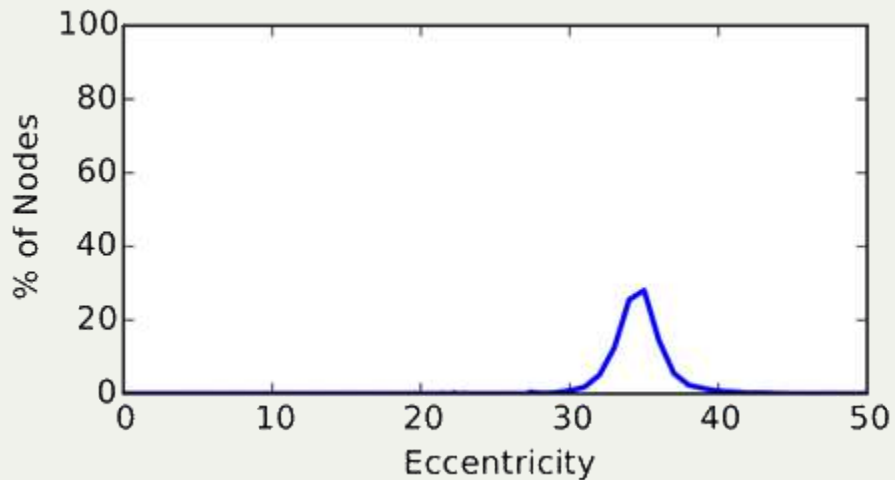
2. Navigability

Largest network component

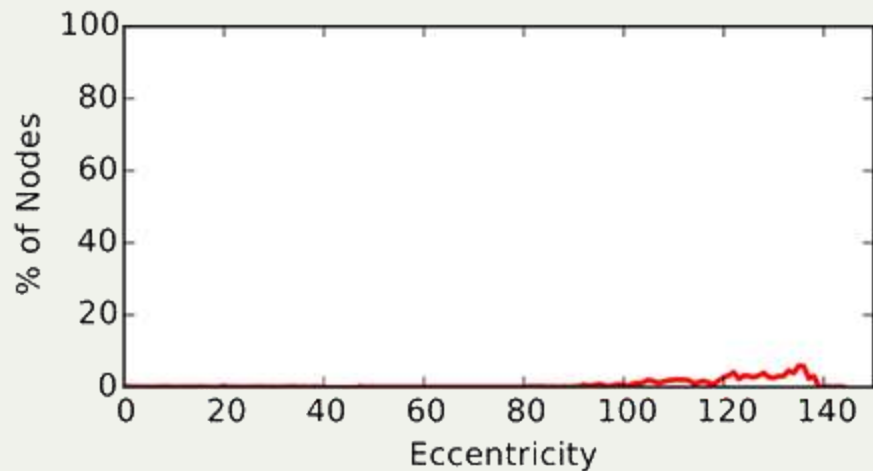


Eccentricity

Collaborative Filtering



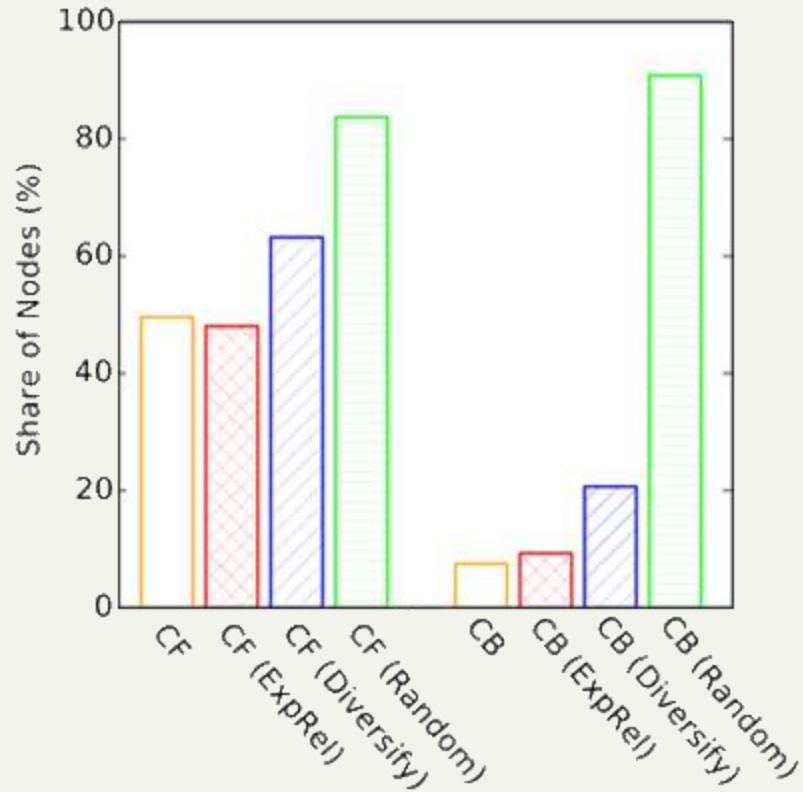
Content-based



Improvement through diversification

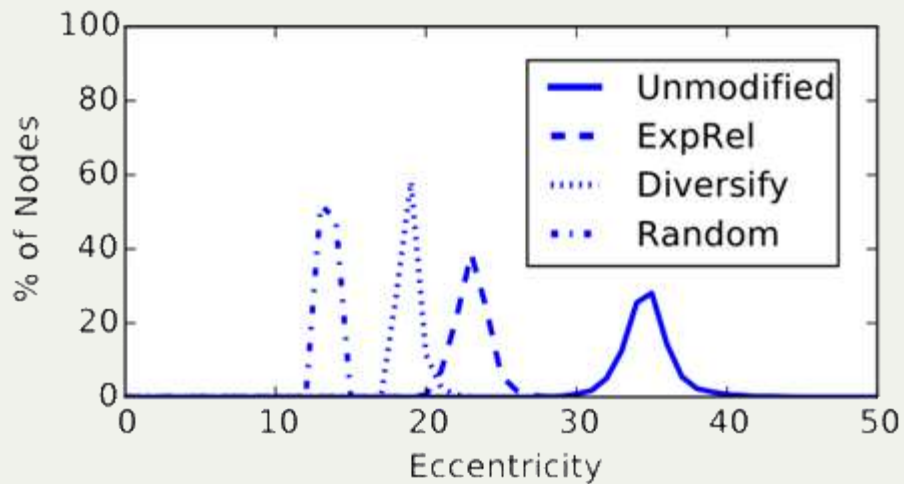
1. **Random**
2. **Diversify**: minimize similarity to others
[Ziegler et al. 2005]
3. **ExpRel**: maximize neighborhood size
[Küçüktunç et al. 2013]

Largest network component

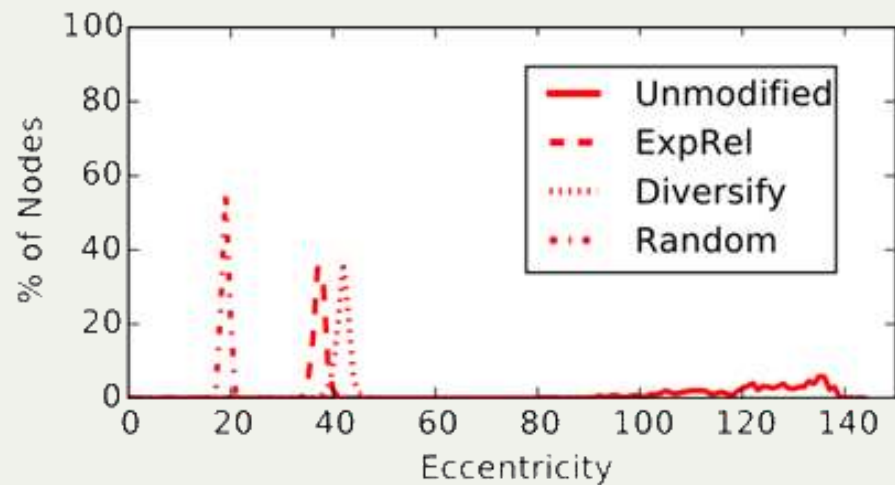


Eccentricity

Collaborative Filtering



Content-based



1. Reachability

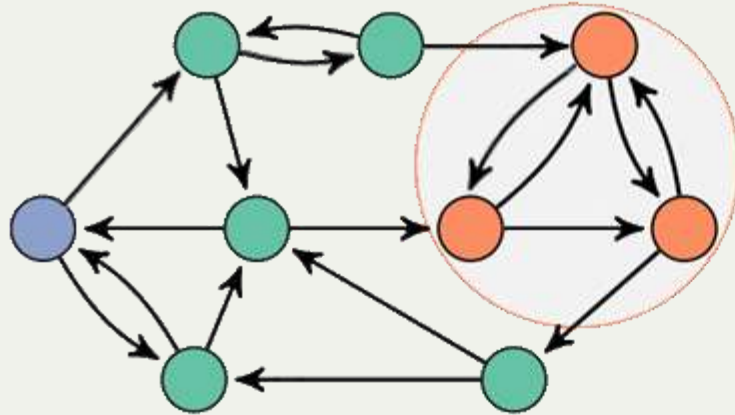
2. Navigability

Navigability

How well do the networks fare in browsing scenarios?

Navigability

Decentralized Search



Start Node



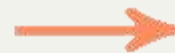
Intermediate Node



Target Node



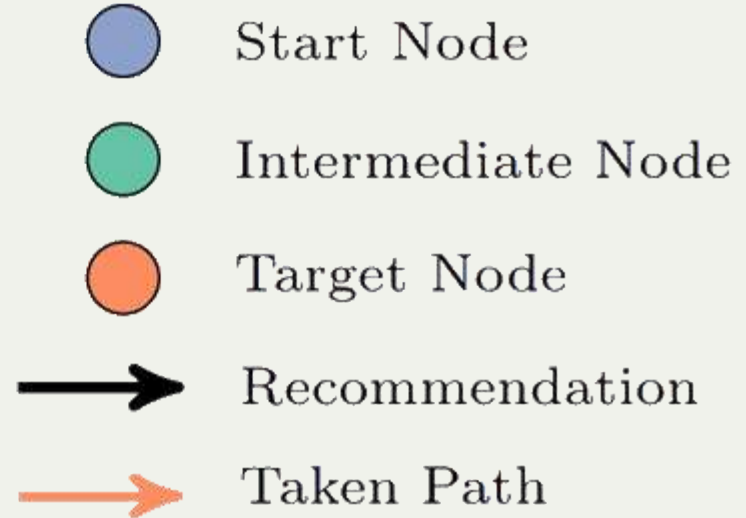
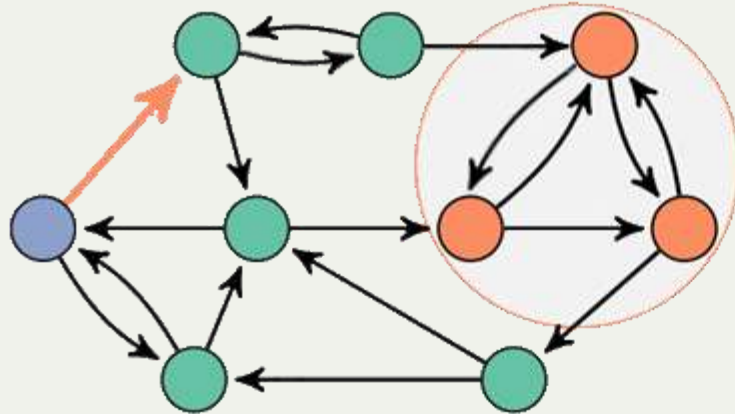
Recommendation



Taken Path

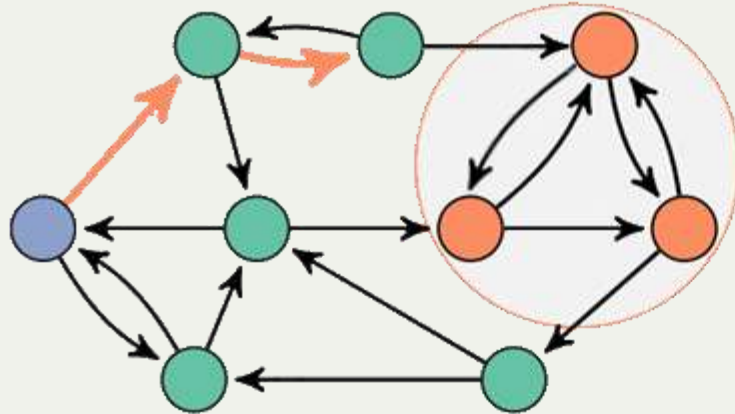
Navigability

Decentralized Search



Navigability

Decentralized Search



Start Node



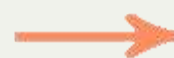
Intermediate Node



Target Node



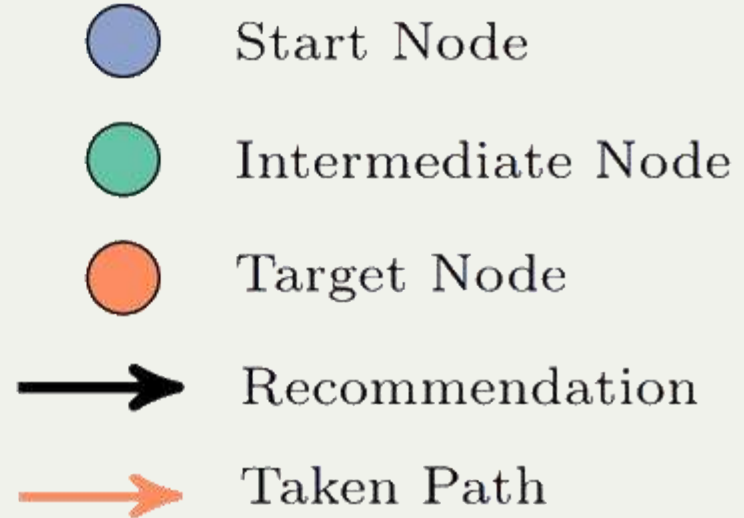
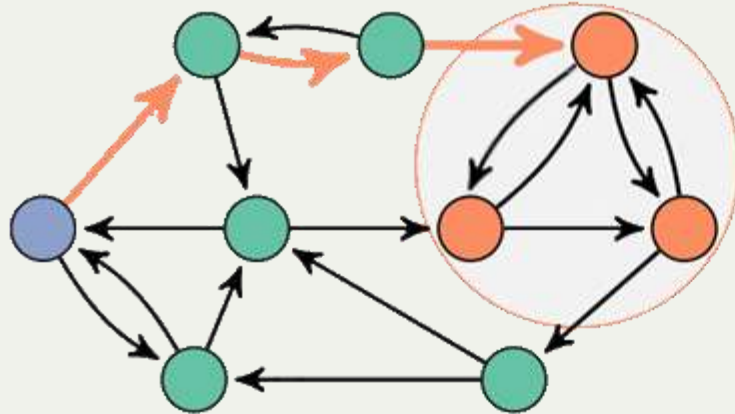
Recommendation



Taken Path

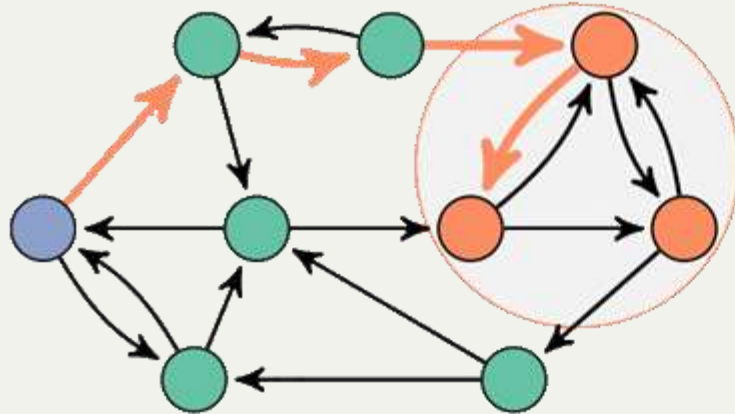
Navigability

Decentralized Search



Navigability

Decentralized Search



Start Node



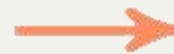
Intermediate Node



Target Node



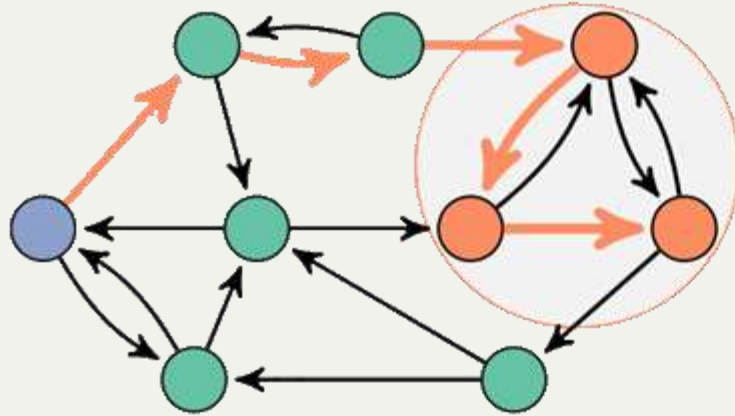
Recommendation





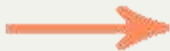


Taken Path

Navigability

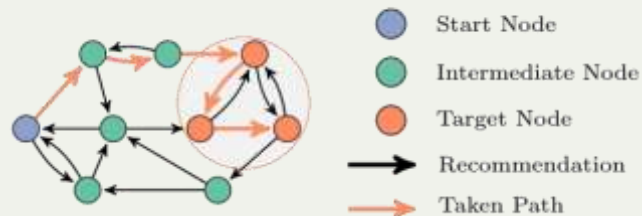
Decentralized Search



-  Start Node
-  Intermediate Node
-  Target Node
-  Recommendation
-  Taken Path

Navigability

Decentralized Search



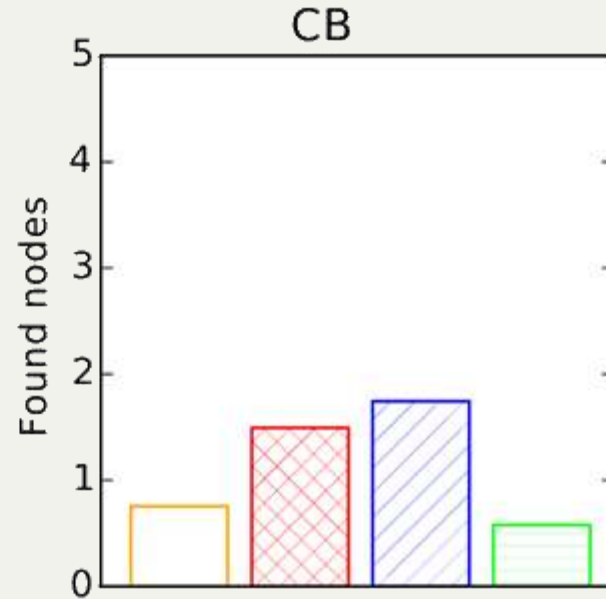
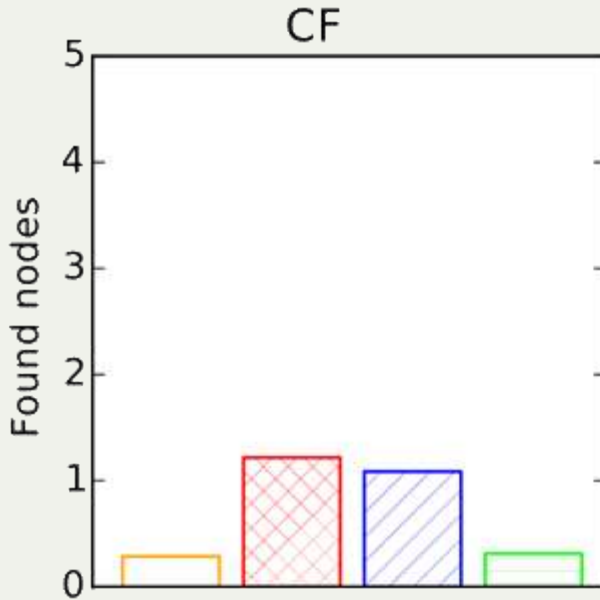
Start: random nodes in the largest component

Targets: IMDb genre top lists

Link selection: based on TF/IDF similarity to target

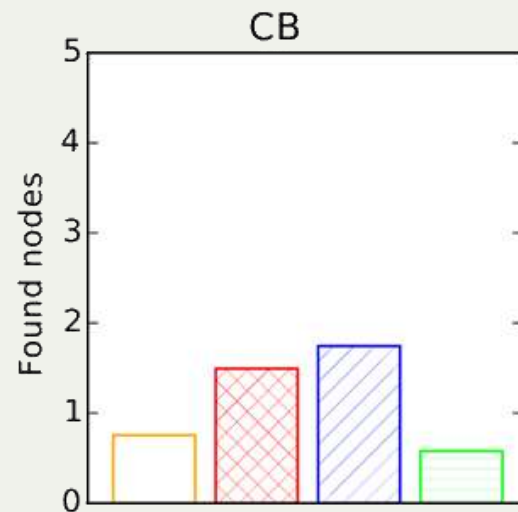
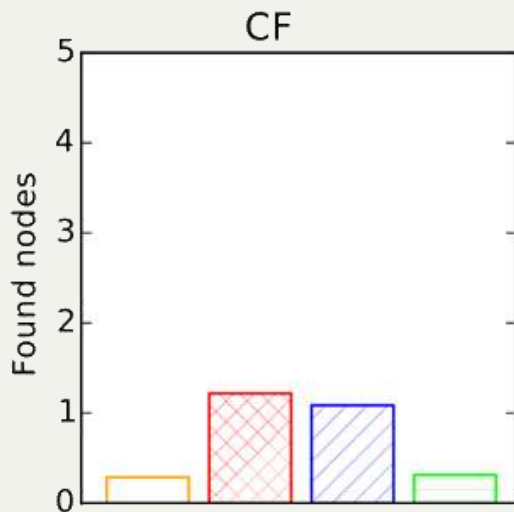
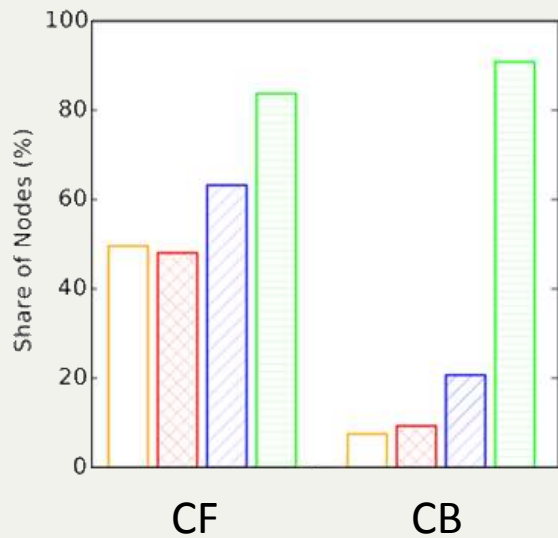
We simulate around 10k missions

Navigability



Navigability

Largest Component



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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[1] <http://web.archive.org/web/19961103094738/http://dsiegel.com/balkanization/intro.html>

[2] Ziegler et al. Improving recommendation lists through topic diversification. WWW'05

[3] Küçüktunç et al. Diversified recommendation on graphs: pitfalls, measures, and algorithms. WWW'13