IMPROVING RECOMMENDER SYSTEM NAVIGABILITY THROUGH DIVERSIFICATION

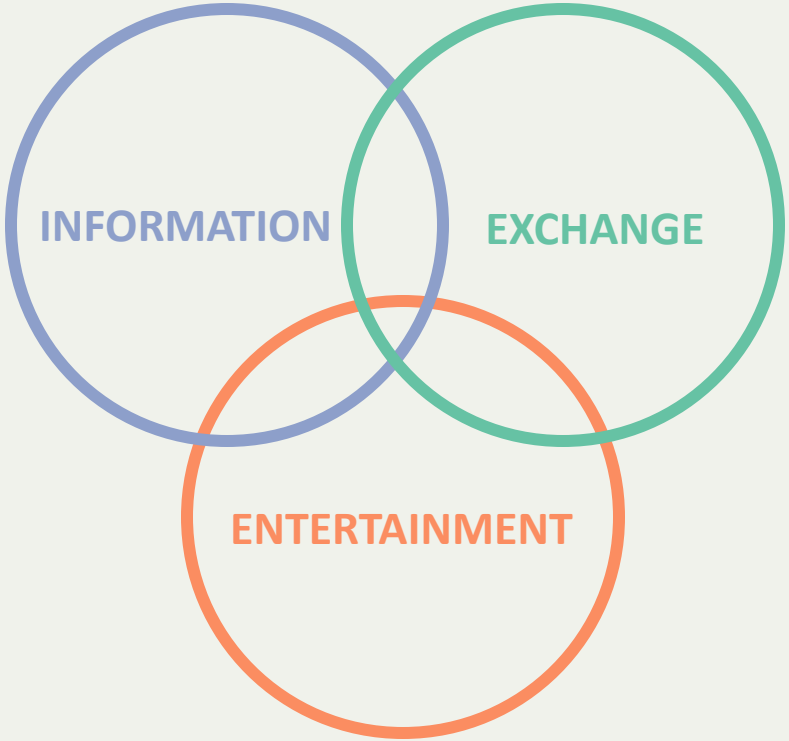
A CASE STUDY OF IMDB

Daniel Lamprecht
Florian Geigl
Tomas Karas
Simon Walk
Denis Helic

Graz University of Technology

Markus Strohmaier

GESIS & Universität Koblenz-Landau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ENTERTAINMENT

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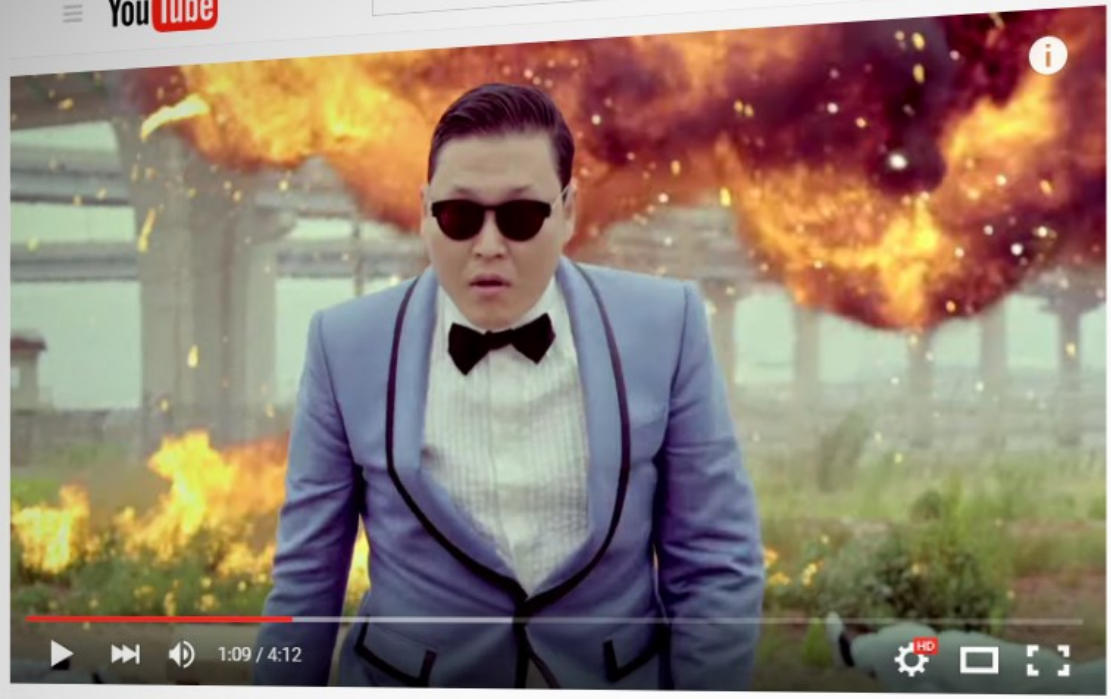

PSY - GANGNAM STYLE(강남스타일) M/V

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Recommendations serve to

reduce information overload

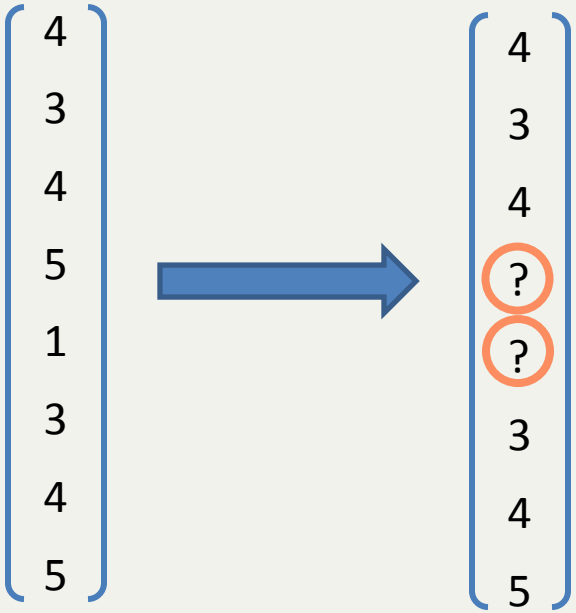
recommend matching items

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 cosume content

enable browsing

help to discover novel content

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IMDb

Back to the Future

People who liked this also liked...

Learn more

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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.

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

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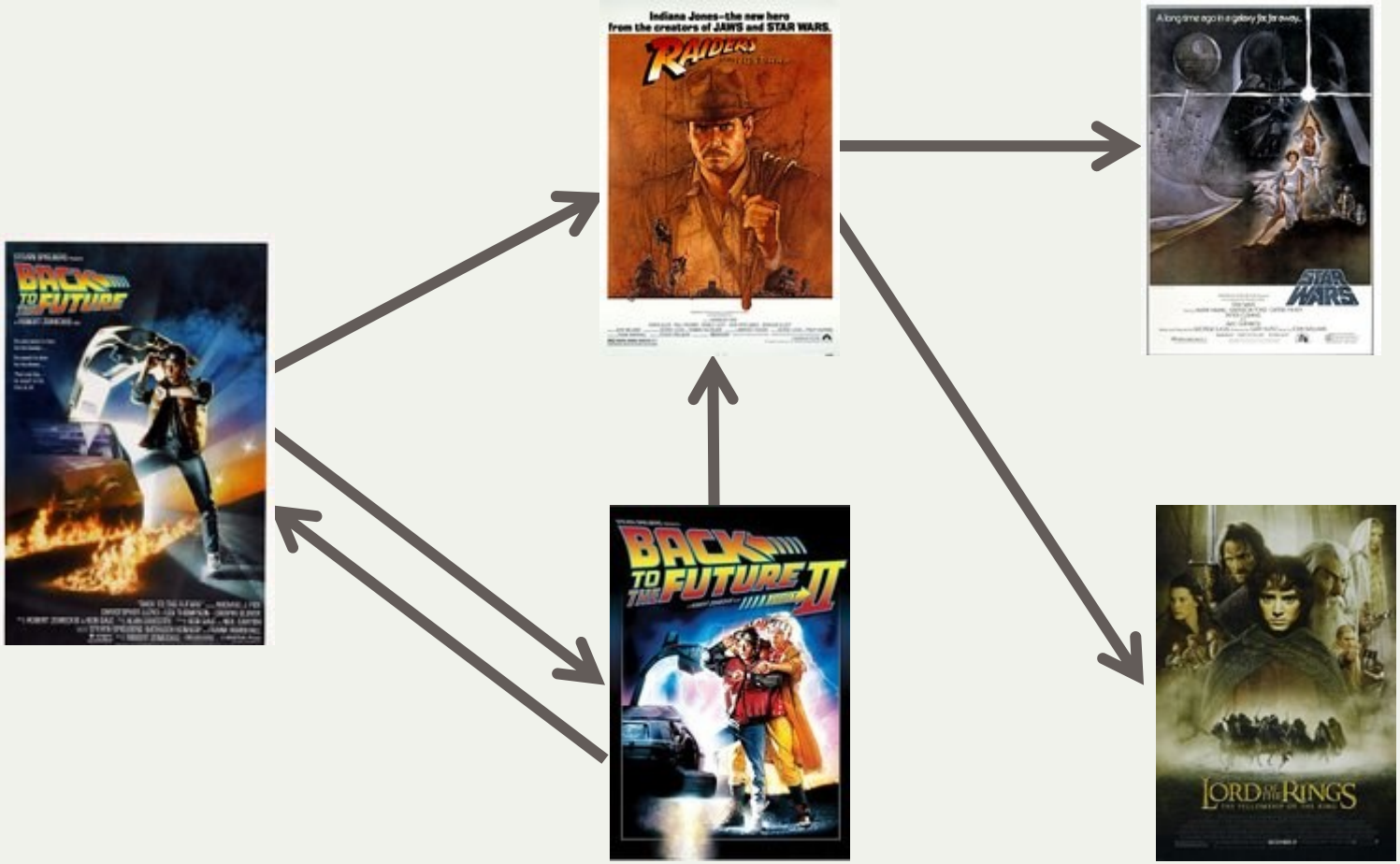
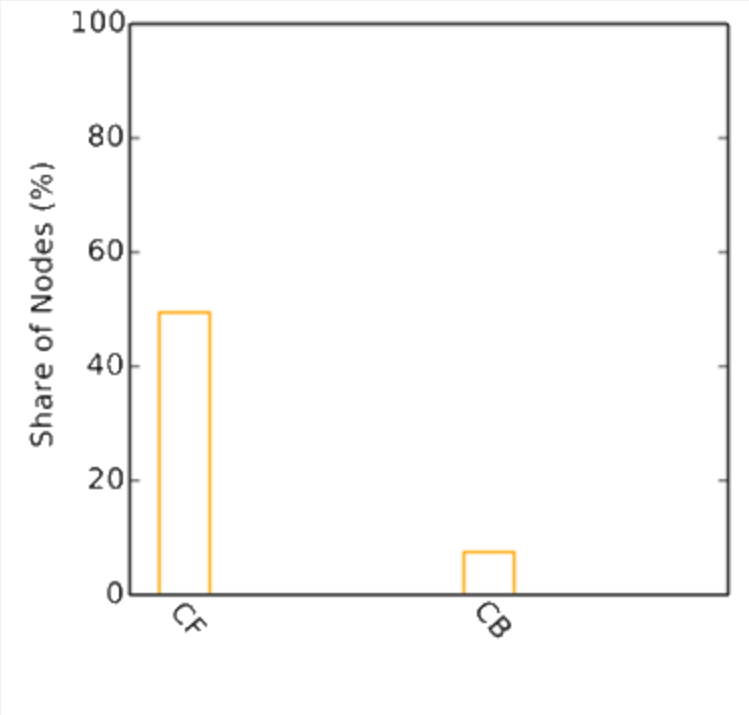


1. **Reachability**
2. Navigability

Largest network component

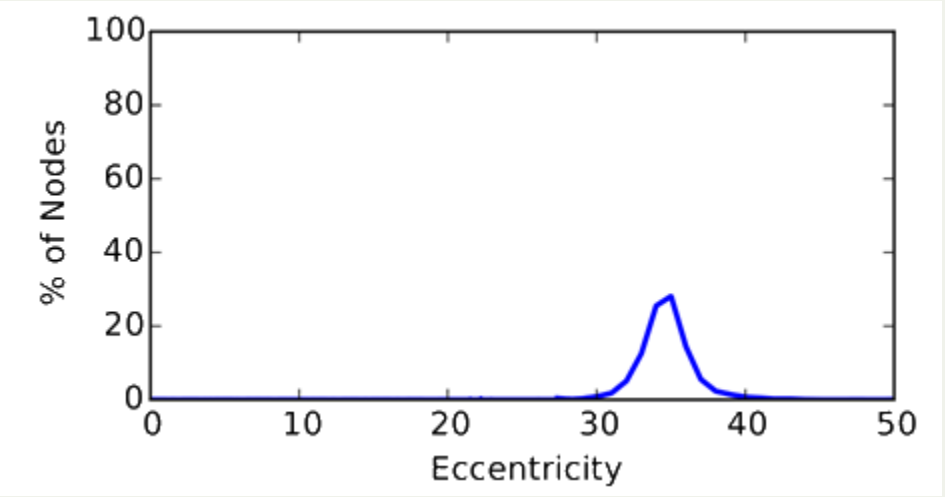
Largest network component



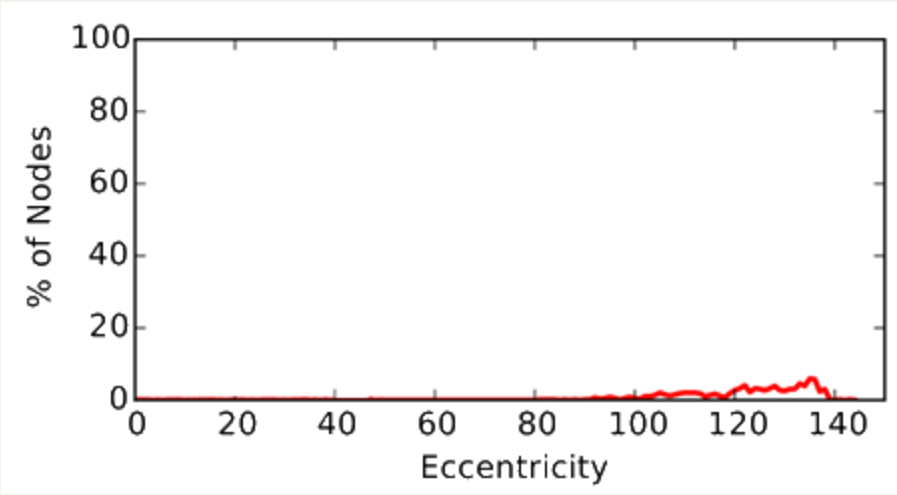
Eccentricity

Eccentricity

Collaborative Filtering



Content-based



Improvement through diversification

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1. **Random**

Improvement through diversification

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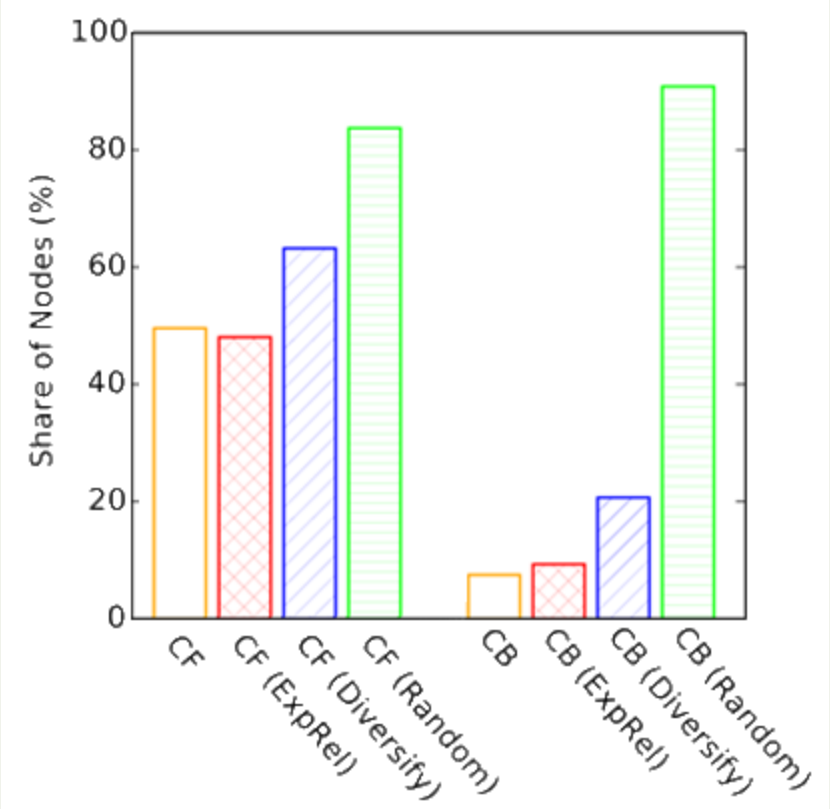
2. **Diversify**: minimize similarity to others [Ziegler et al. 2005]

Improvement through diversification

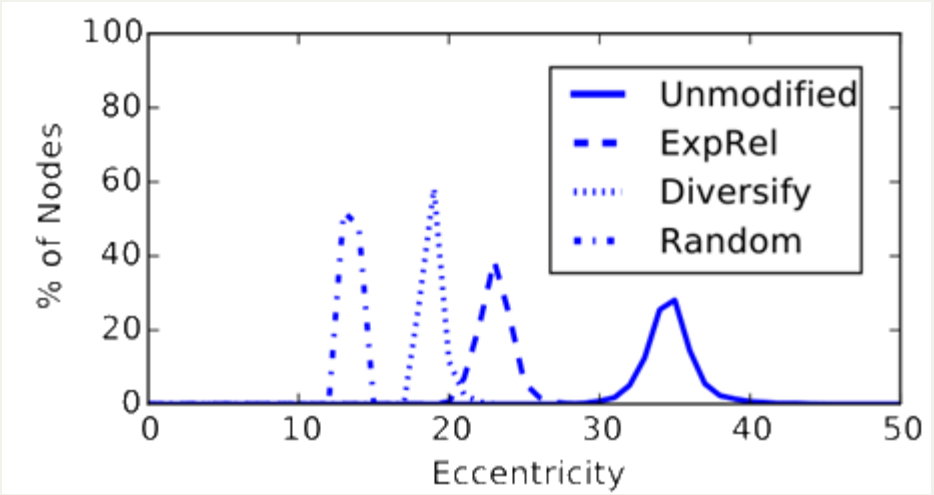
1. **Random**
2. **Diversify**: minimize similarity to others [Ziegler et al. 2005]
3. **ExpRel**: maximize neighborhood size [Küçüktunç et al. 2013]

Largest network component

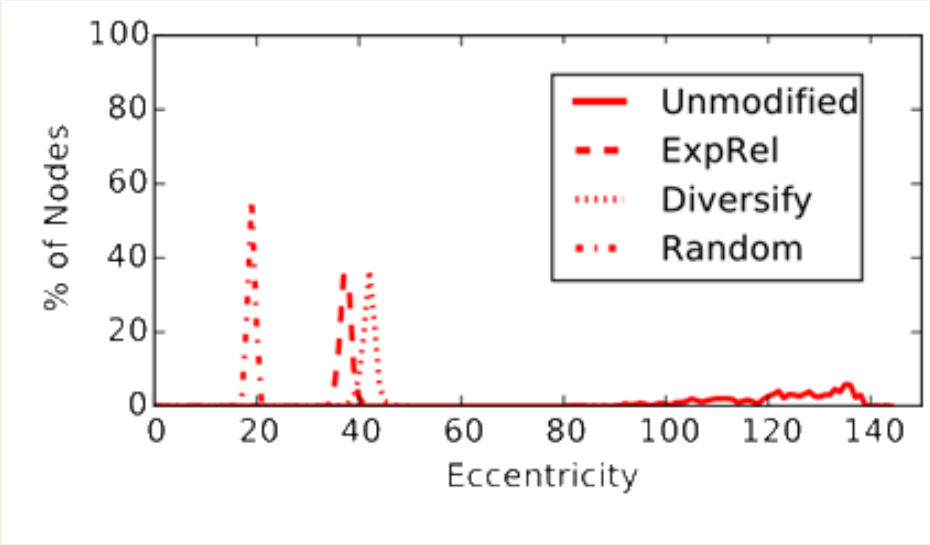


Eccentricity

Collaborative Filtering



Content-based

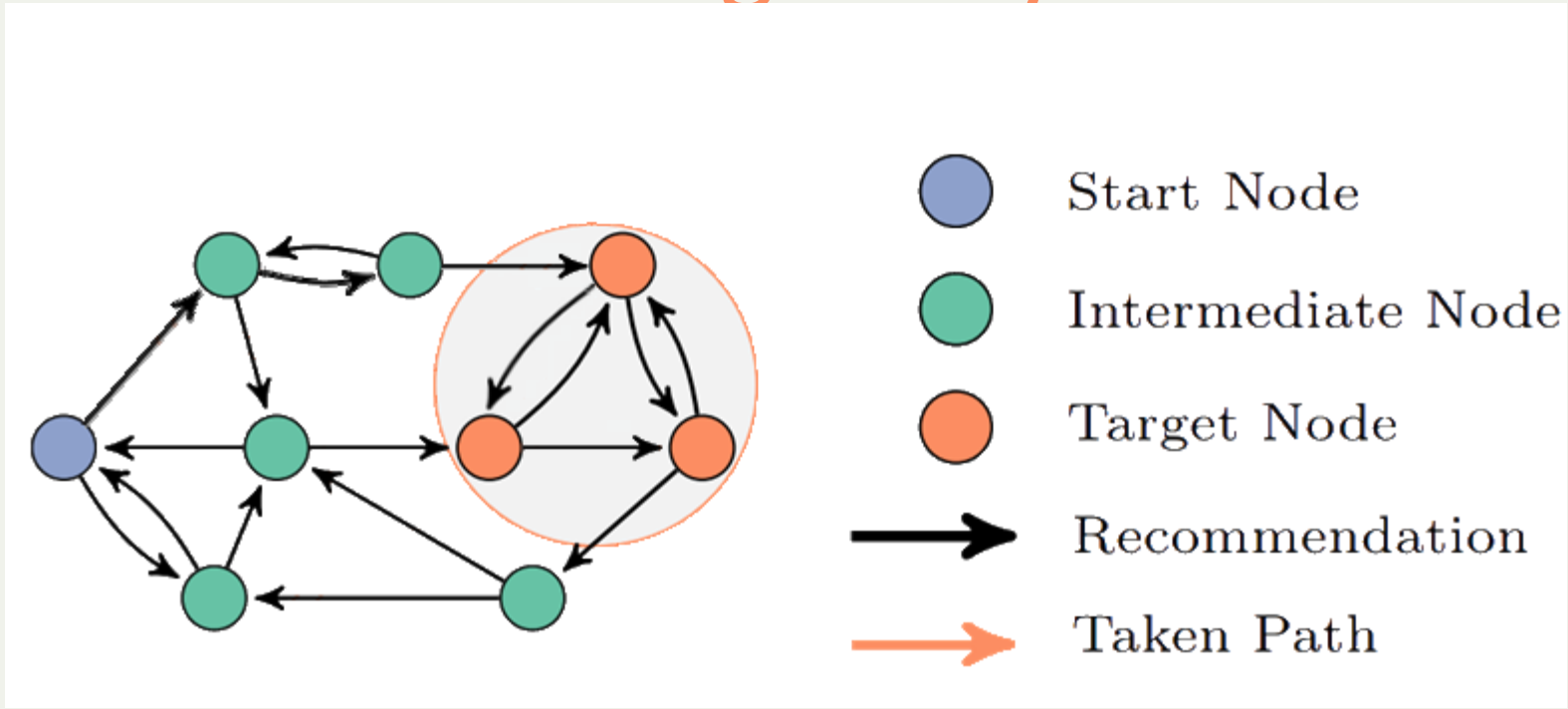


1. Reachability
2. **Navigability**

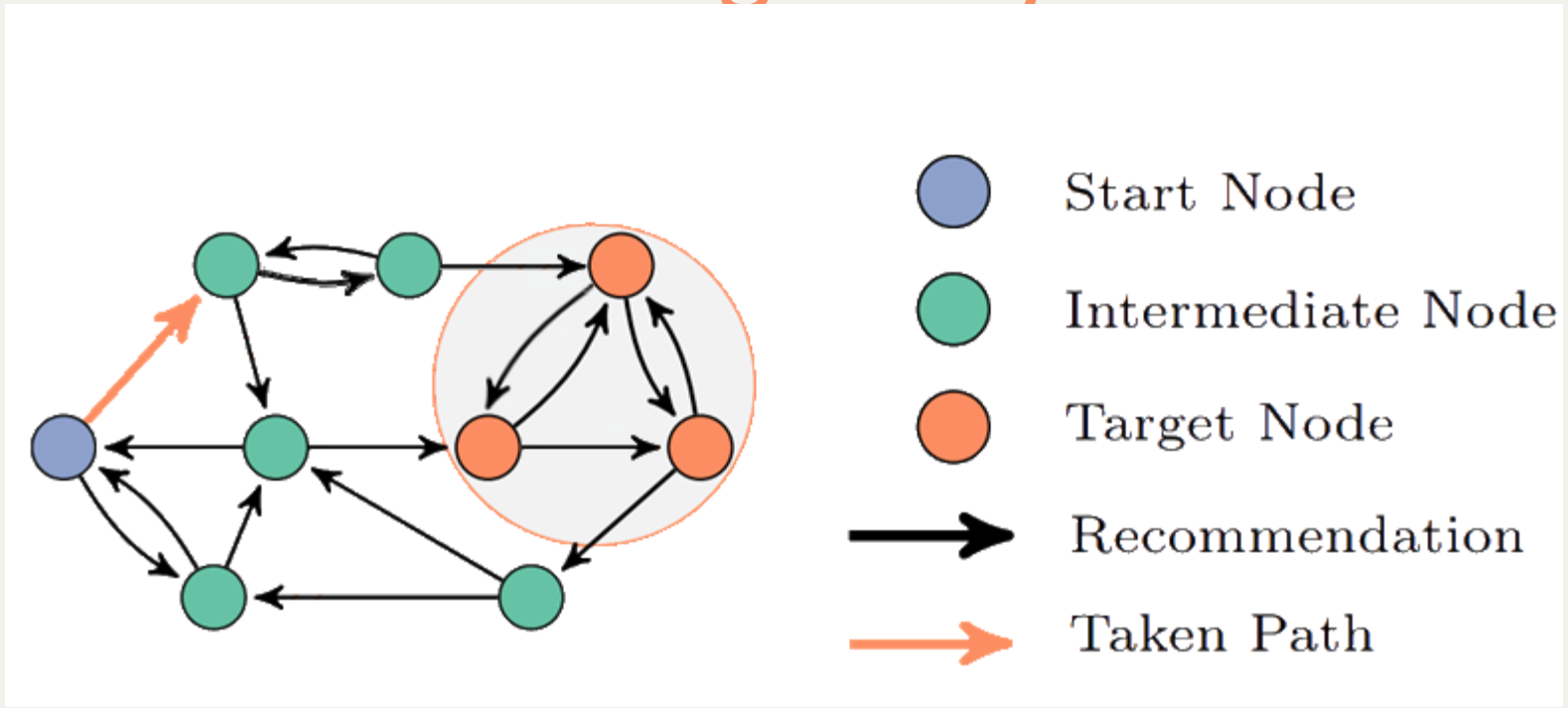
Navigability

How well do the networks fare in browsing scenarios?

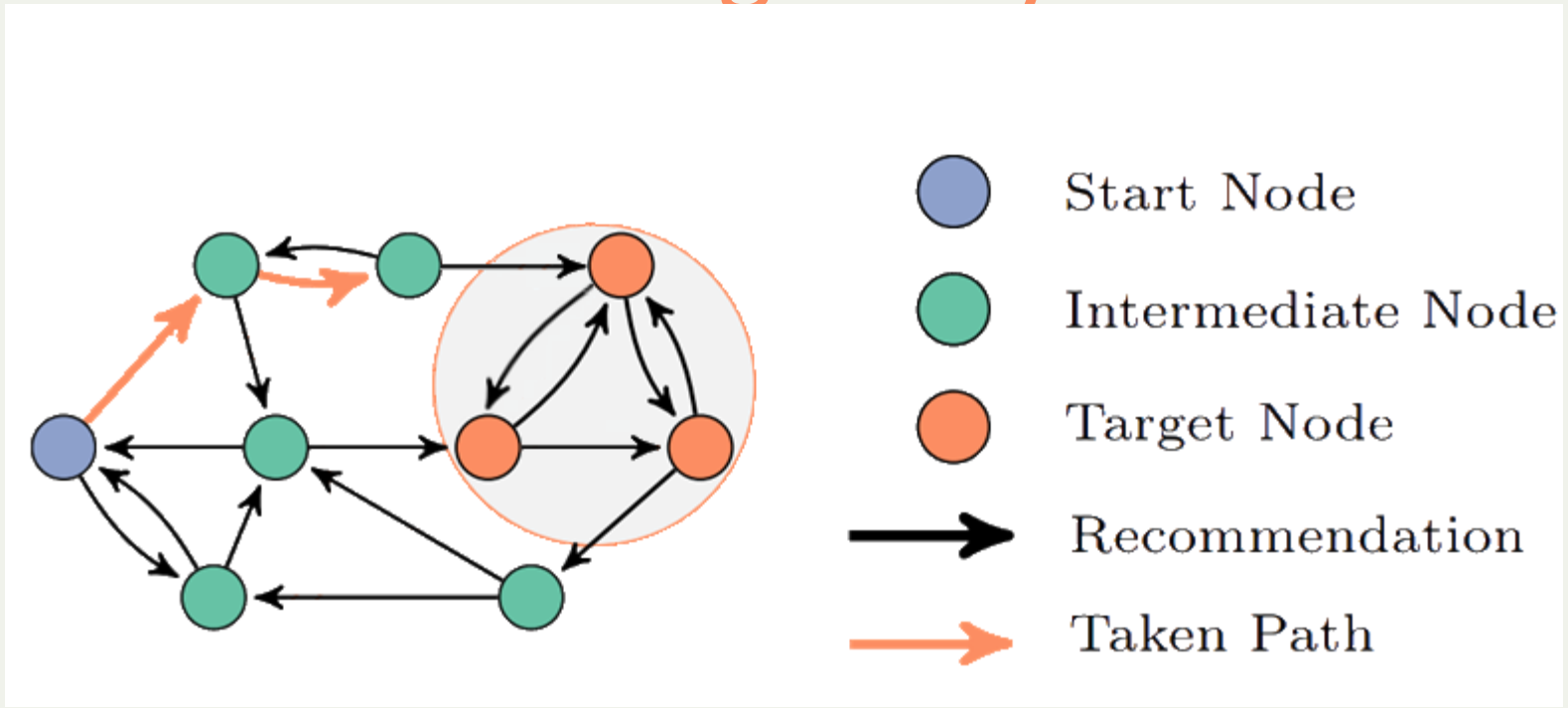
Navigability



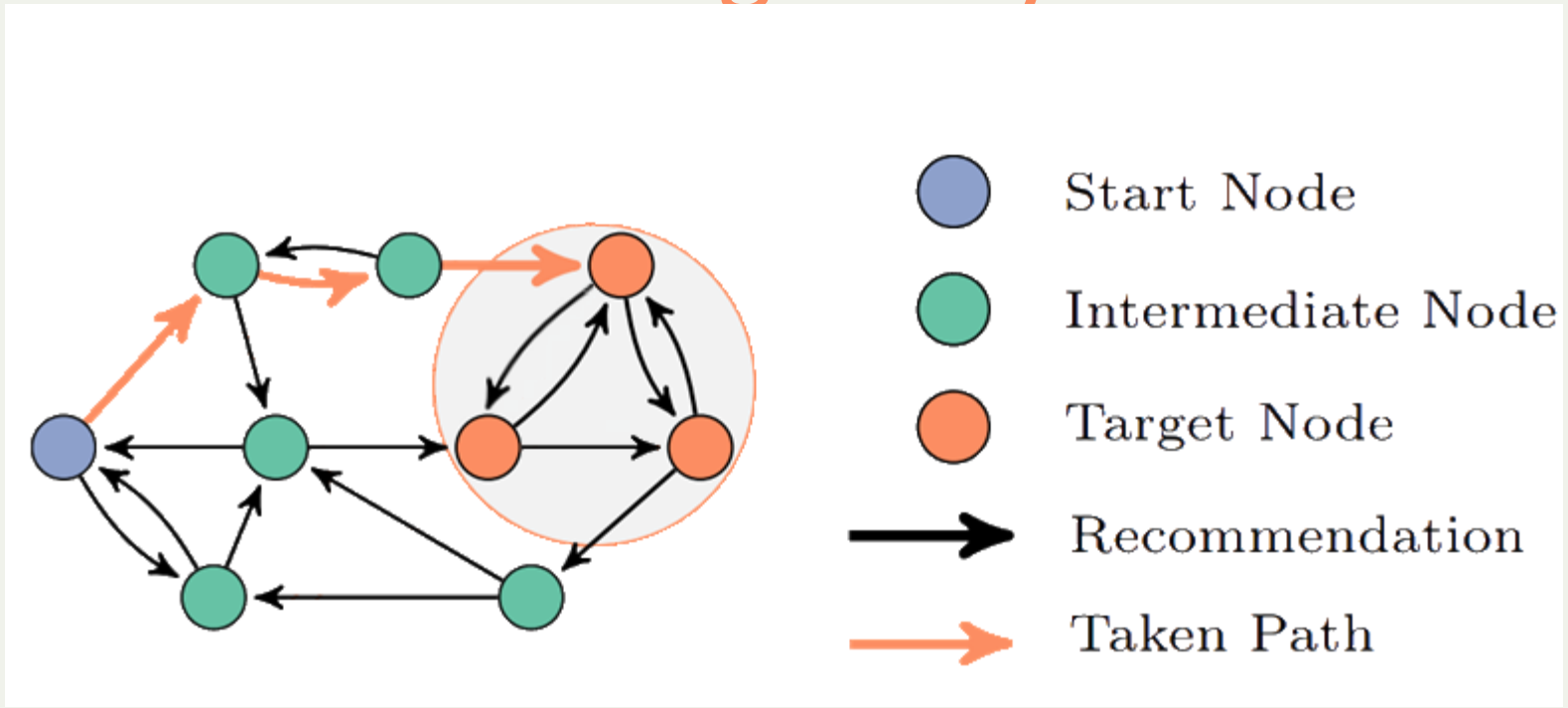
Navigability



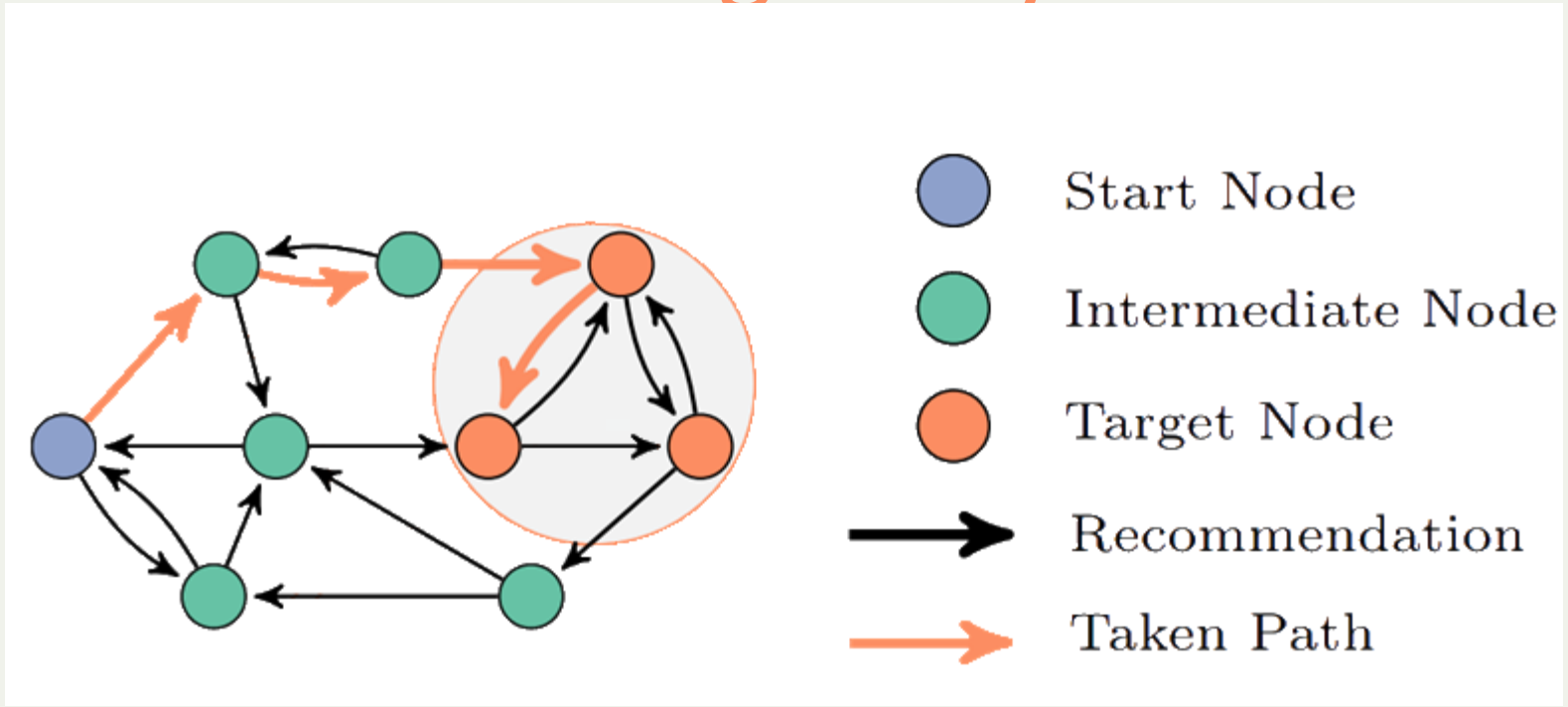
Navigability



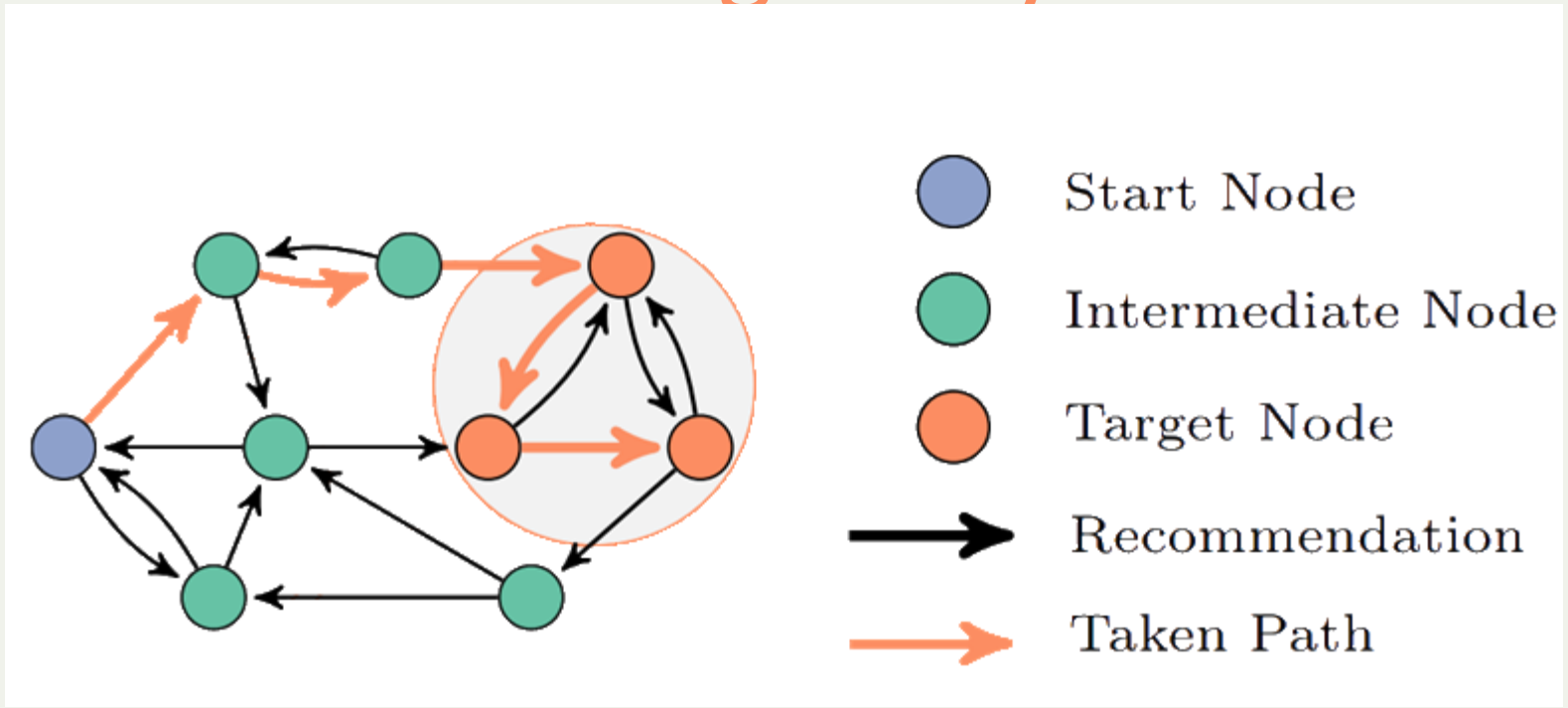
Navigability



Navigability

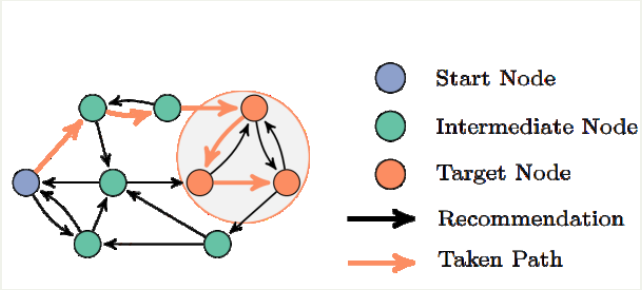


Navigability



Navigability

Decentralized Search



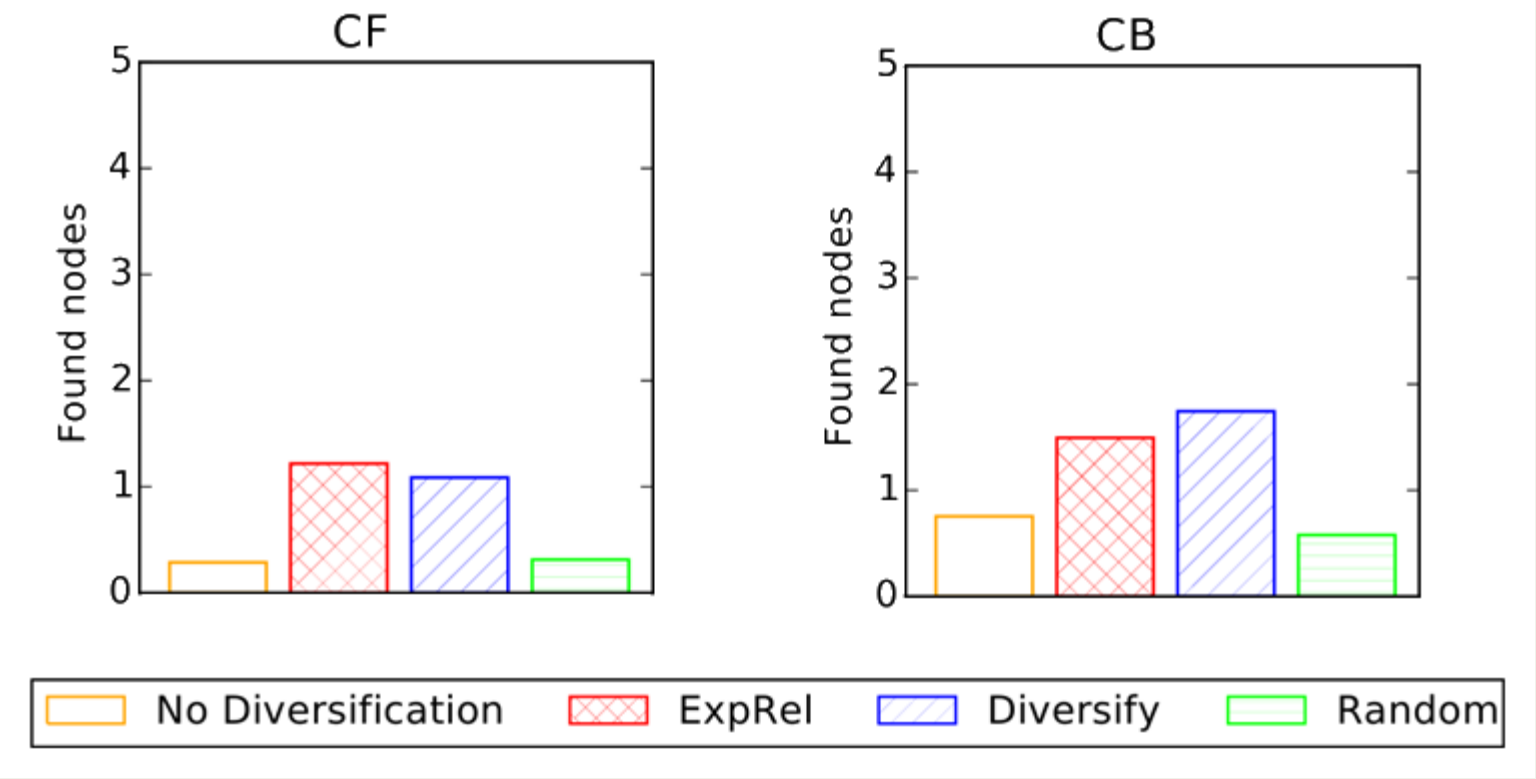
Start: random nodes in the largest component

Targets: IMDb genre top lists

Link selection: based on TF/IDF similarity to target

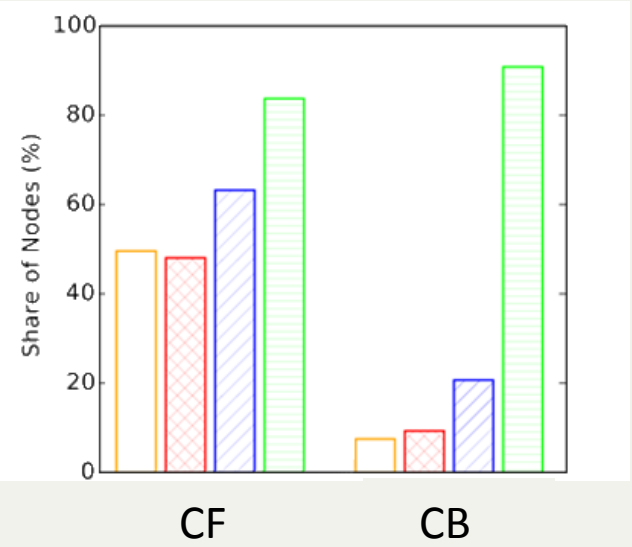
We simulate around 10k missions

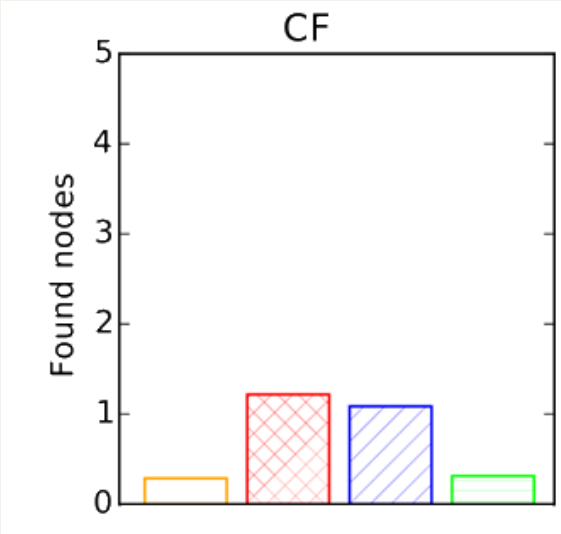
Navigability

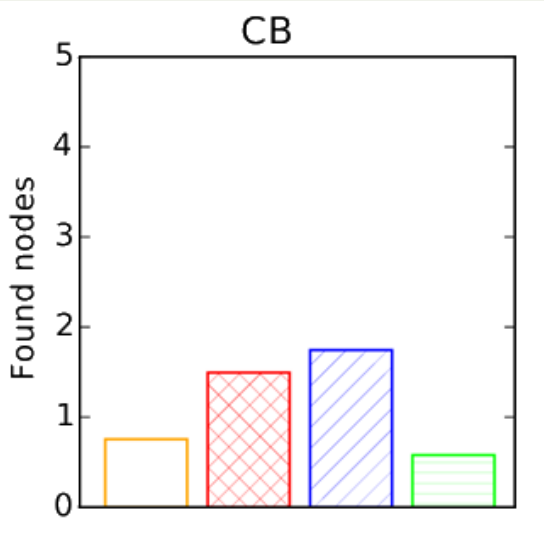


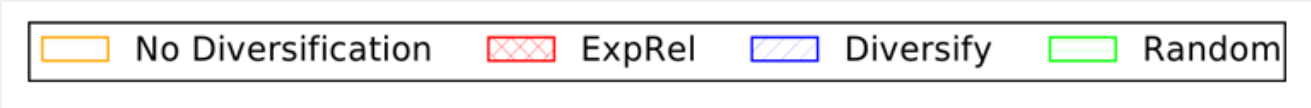
Navigability

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