A Method for Evaluating the Navigability of Recommendation Algorithms

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Information Retrieval

- obtain resources to satisfy an information need

- 3 ways [Elaine Toms, 2000]:

  - familiar items

  - unexpressable but recognizable items

  - serendipitious discovery

Information Retrieval

- obtain resources to satisfy an information need

- 3 ways [Elaine Toms, 2000]:

  – familiar items (Search)

  – unexpressable but recognizable items (Search & Navigation)

  – serendipitious discovery (Navigation)

Recommendation networks
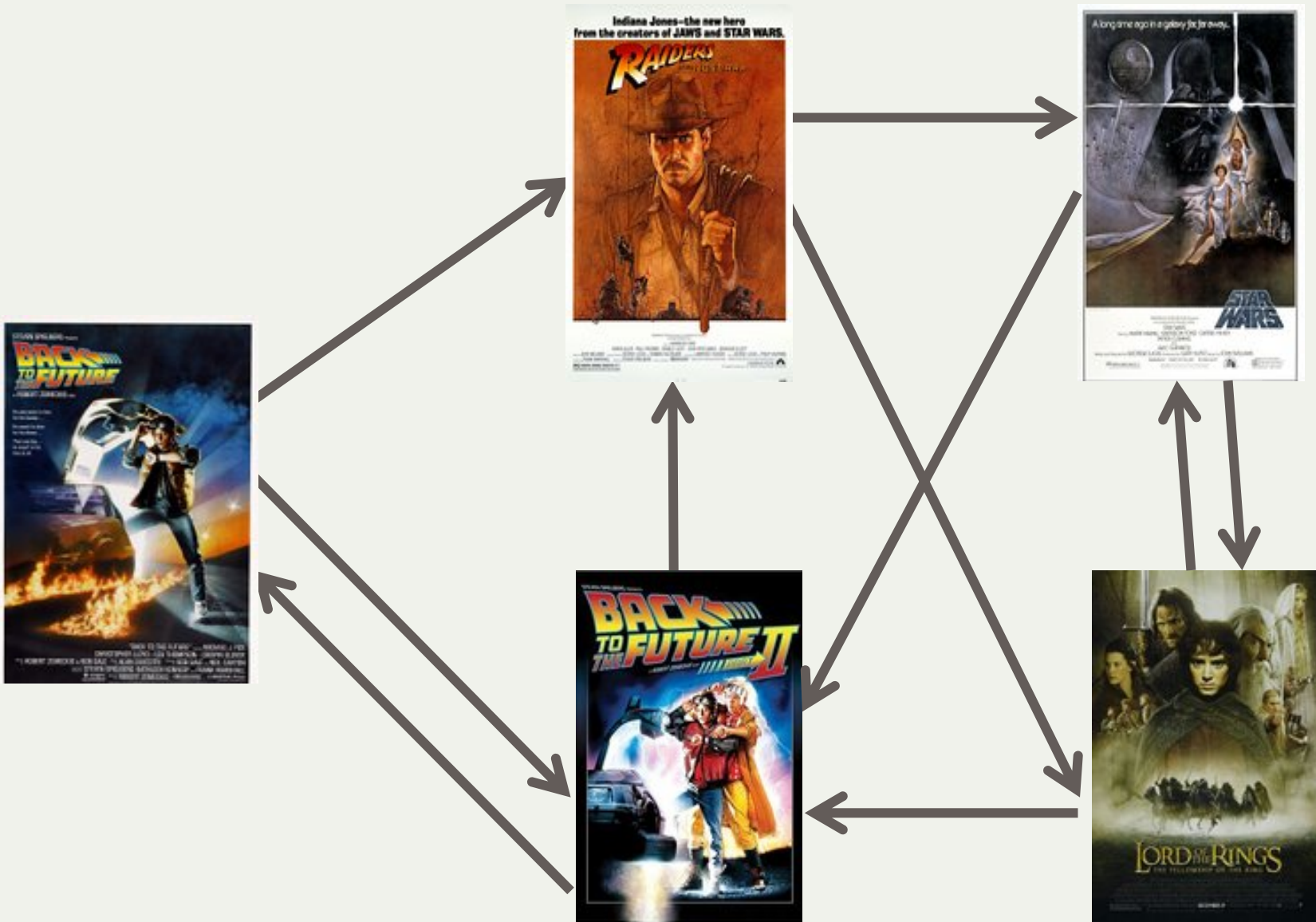
Problem

- initially, recommender algorithms were mostly evaluated based on accuracy

- later, additional dimensions (diversity, novelty,…)

- suitability of a recommendation algorithm for information retrieval/navigation cannot be evaluated

- → We present a novel evaluation method

Decentralized Search

- a **graph search algorithm**
- based on **local knowledge**

  --> *greedy selection among neighbors*

- based on **intutitions**

  --> heuristic

Navigability

Decentralized Search
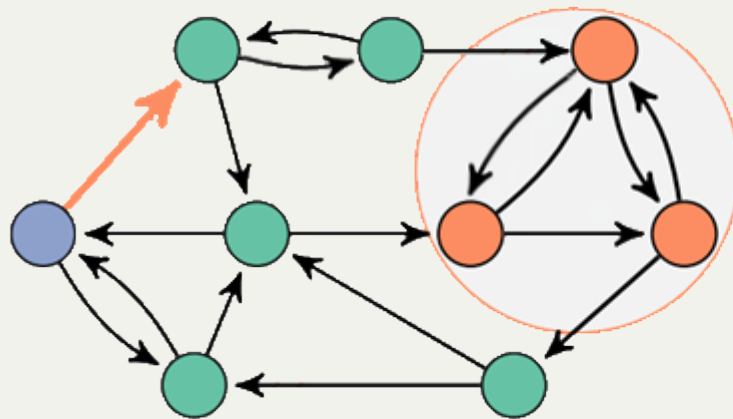
Legend:
- Start Node (blue)
- Intermediate Node (green)
- Target Node (orange)
- Recommendation (black arrow)
- Taken Path (orange arrow)

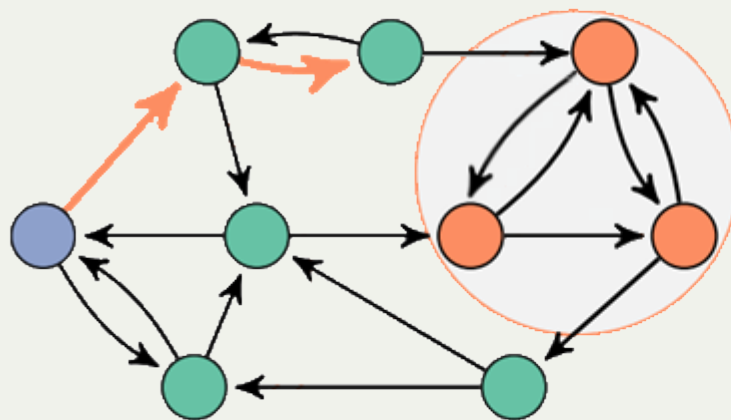# Navigability

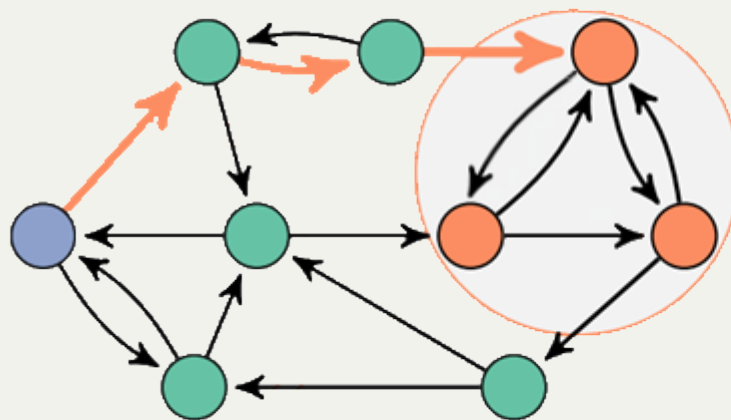## Decentralized Search

Navigability

Decentralized Search
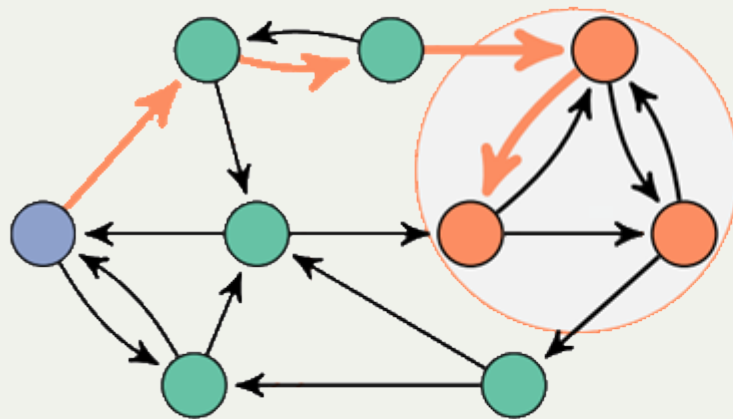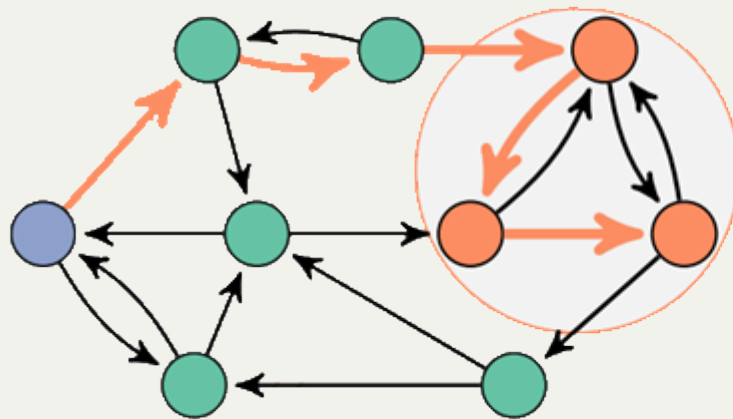
Navigability

Decentralized Search
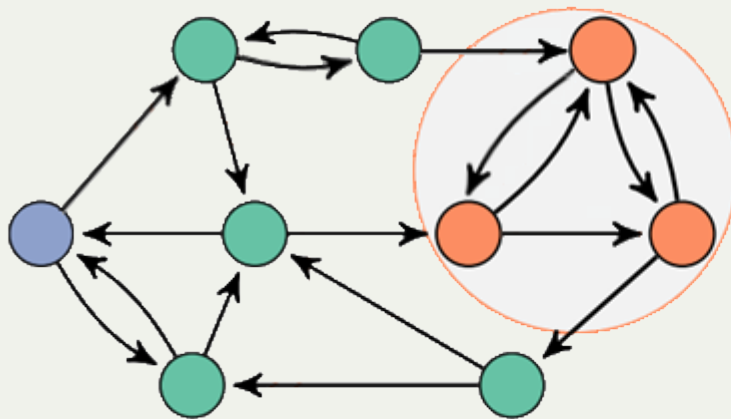
Start Node
Intermediate Node
Target Node
Recommendation
Taken Path

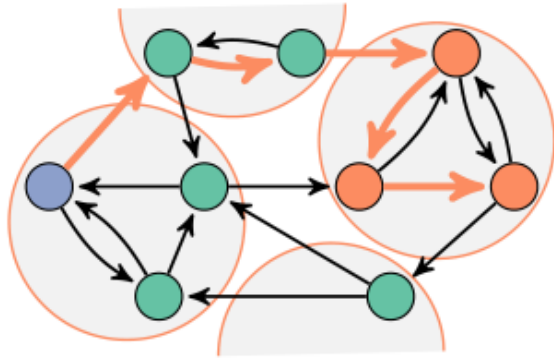# Navigability

Decentralized Search

Navigability

Decentralized Search

Information Seeking Scenarios

Information Foraging
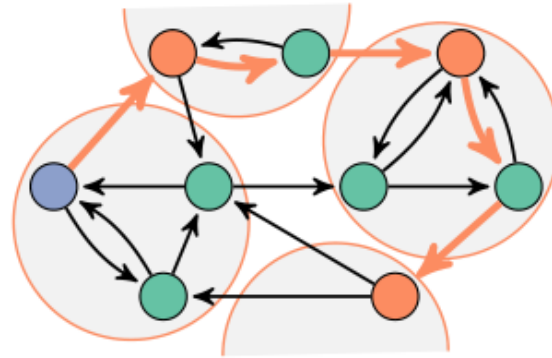
Berrypicking

Point-To-Point

Start Node
Intermediate Node
Target Node
Recommendation
Taken Path
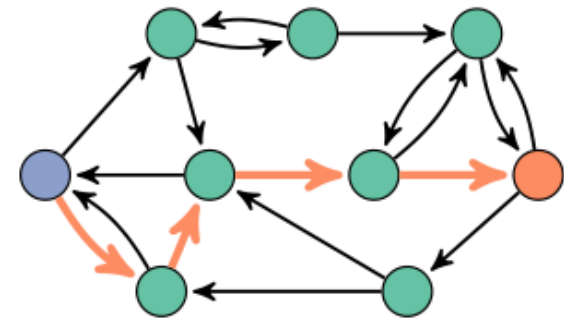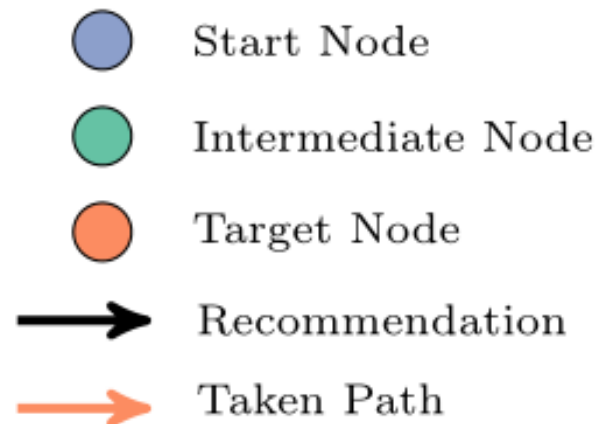
Experimental Setup

- Rating Datasets:
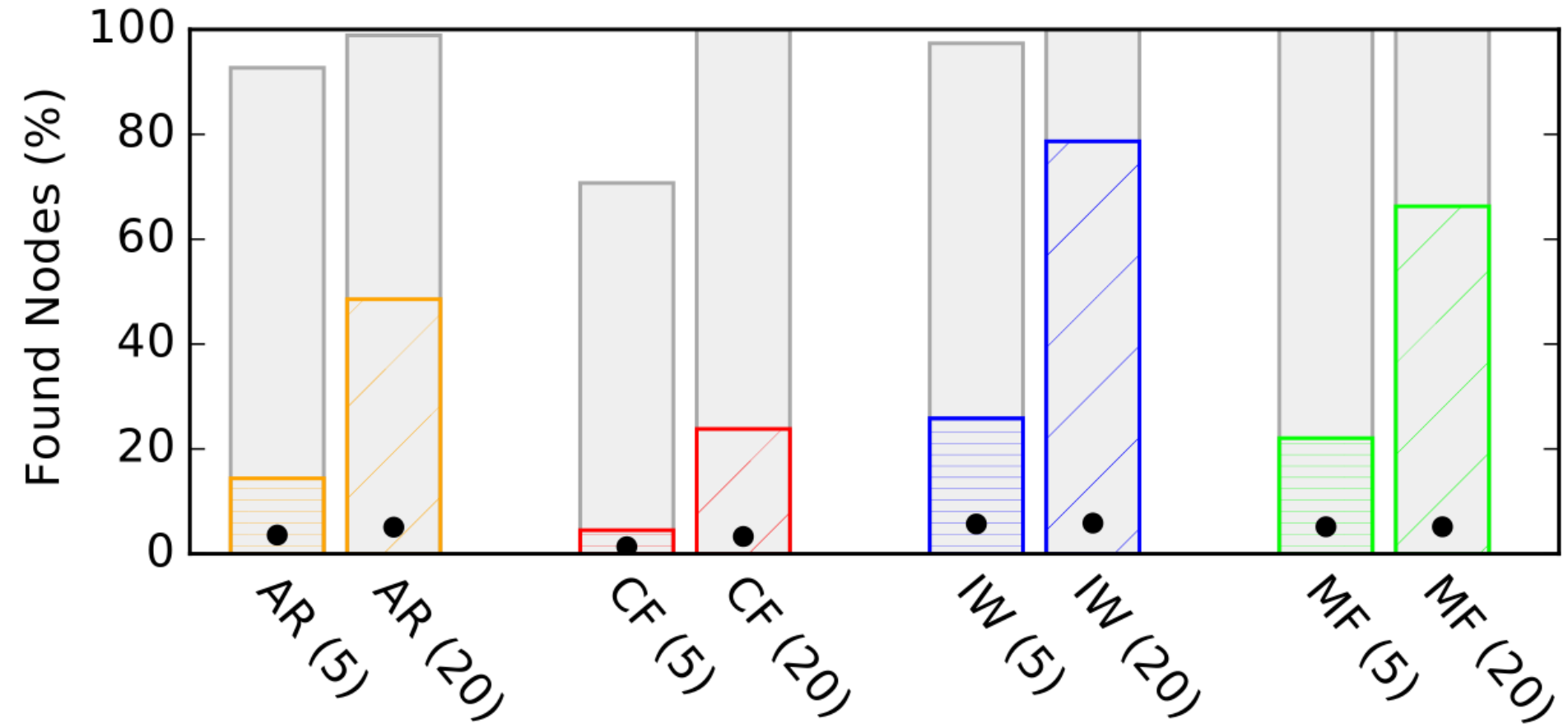

- Recommendation Algorithms:
  – Association Rules, Collaborative Filtering (simple)
  – Interpolation Weights, Matrix Factorization (more complex)

- 1,200 runs for each combination

Results

- Information Foraging with BookCrossing data

Discussion

- going from N = 5 to N = 20 recommendations substantially increases navigability

- Explorative scenarios better supported

- more complex algorithms lead to better navigability

Wrap Up

- novel method to evaluate navigability of recommendation algorithms

- method generally applicable

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