

# Using Shortlists to Support Decision Making and Improve Recommender System Performance

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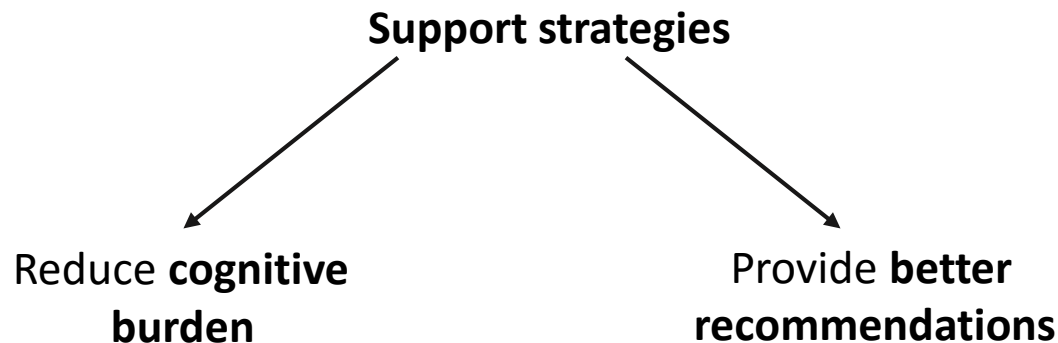
# Using Shortlists to Support Decision Making and Improve Recommender System Performance

Hungry?



## Session-based decision making

- **Why is making a decision hard here?**
  - Large set of options
  - Unfamiliarity with inventory
  - Uncertainty about own preferences



## Session-based decision making

- **Session-based decision making:**
  - Choose one option
  - Information need fixed in session
  
- **Examples:**
  - Choosing a movie for tonight
  - Comparing products (e.g., laptop purchase)
  - Searching for a recipe to make
  - Planning a trip (e.g., picking a hotel)

# Using Shortlists to Support Decision Making and Improve Recommender System Performance

Hungry?



## Exploring - without memory

Movies

All genres ▾

All years ▾

All # stars ▾



Avengers: Age of  
Ultron (2015)



Ex Machina (2015)



Far from the  
Madding Crowd  
(2015)



San Andreas (2015)



Justice League:  
Throne of Atla...  
(2015)

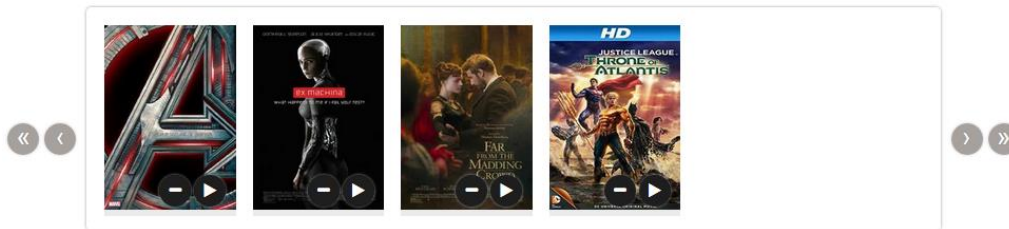


Infini (2015)



## Exploring - with memory

Shortlist [Clear all \(4\)](#)

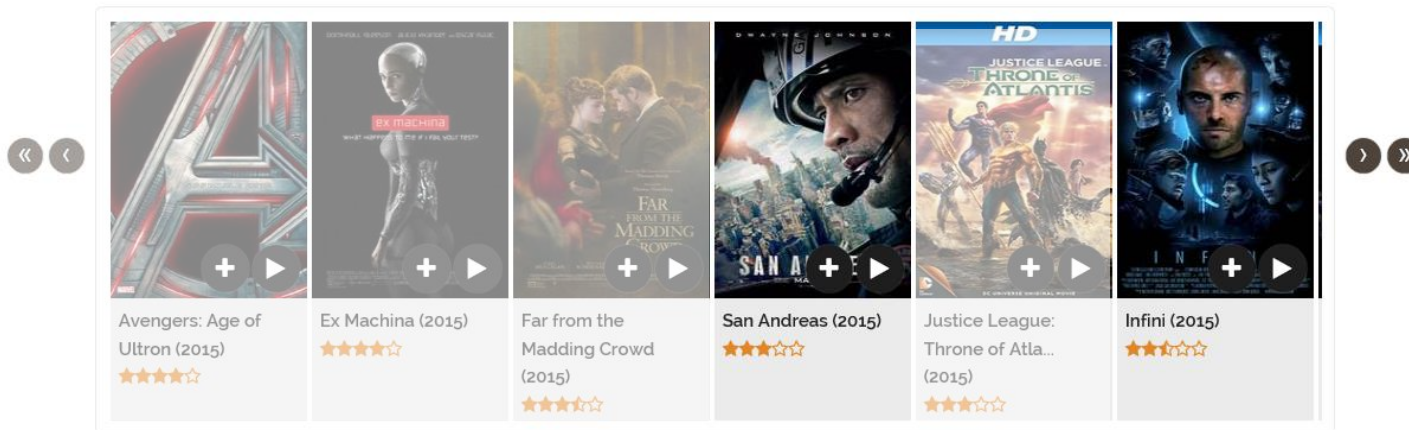


Movies

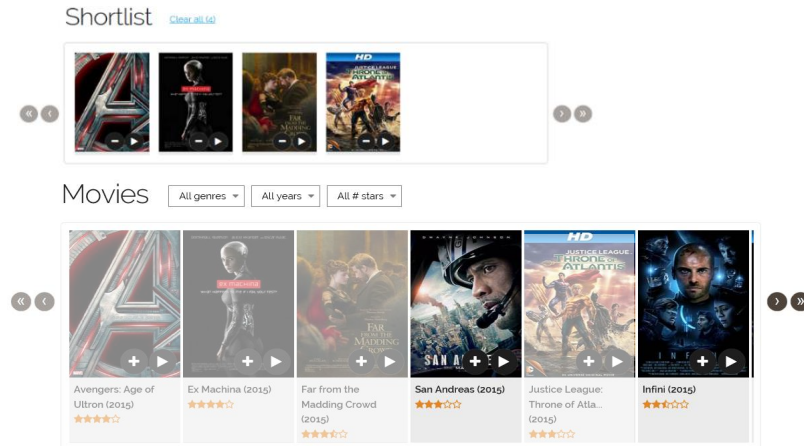
All genres ▾

All years ▾

All # stars ▾



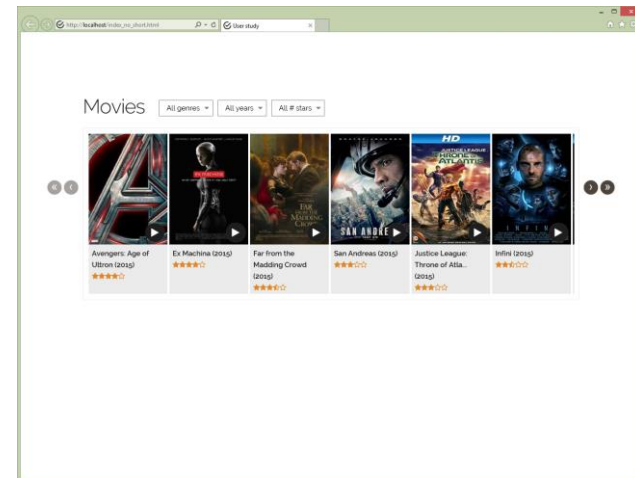
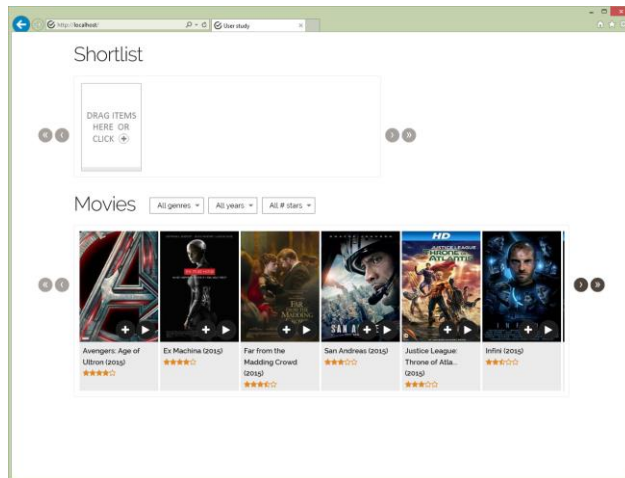
## Research questions



- (1) Do users **appreciate** the **shortlist** interface?
- (2) Do shortlists increase **choice satisfaction**?
- (3) How do users **adapt** their **strategies**?

## User study

- Digital memory (shortlist) vs. no memory

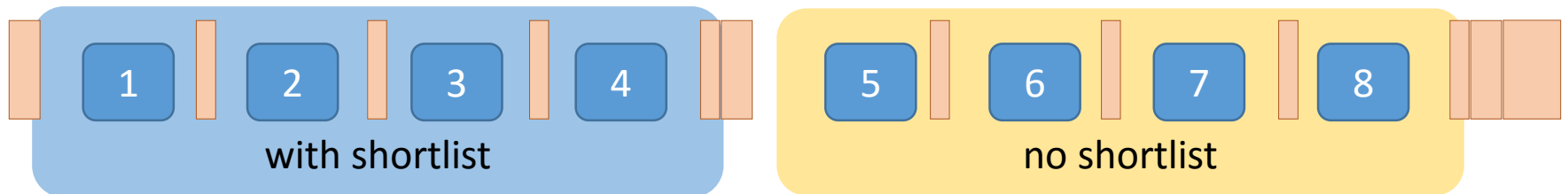


**Task setup:** *Imagine a very good friend you haven't seen in a year is coming to your place to visit. After hanging out for a while, you plan to watch a movie together. In this experiment, you'll be asked to select a movie to watch with your friend.*

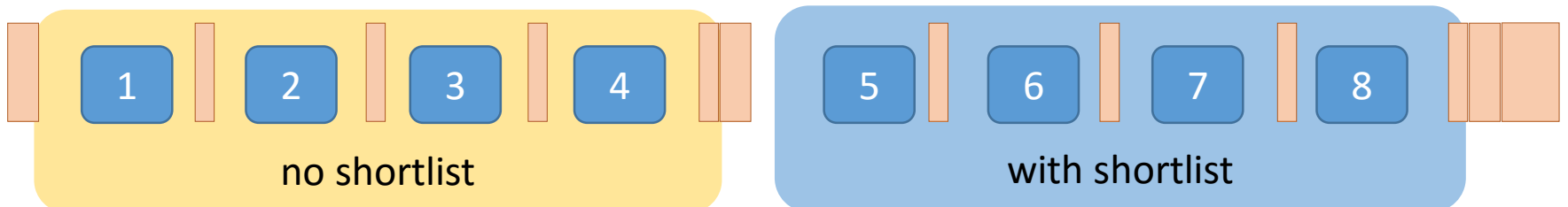
## User study

- 60 users, almost all of them were PhD students in STEM
- 75% men, 25% women
- Two flights across eight distinct sets of movies (1000 per session)

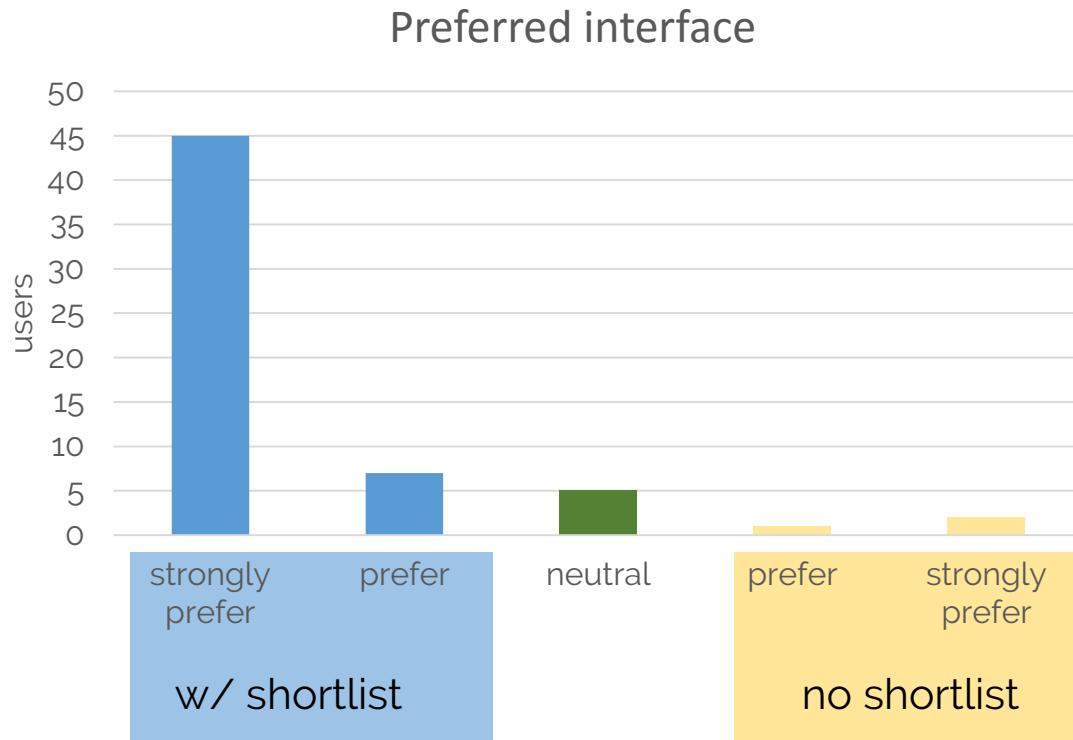
### Flight 1 (shortlist first):



### Flight 2 (shortlist last):



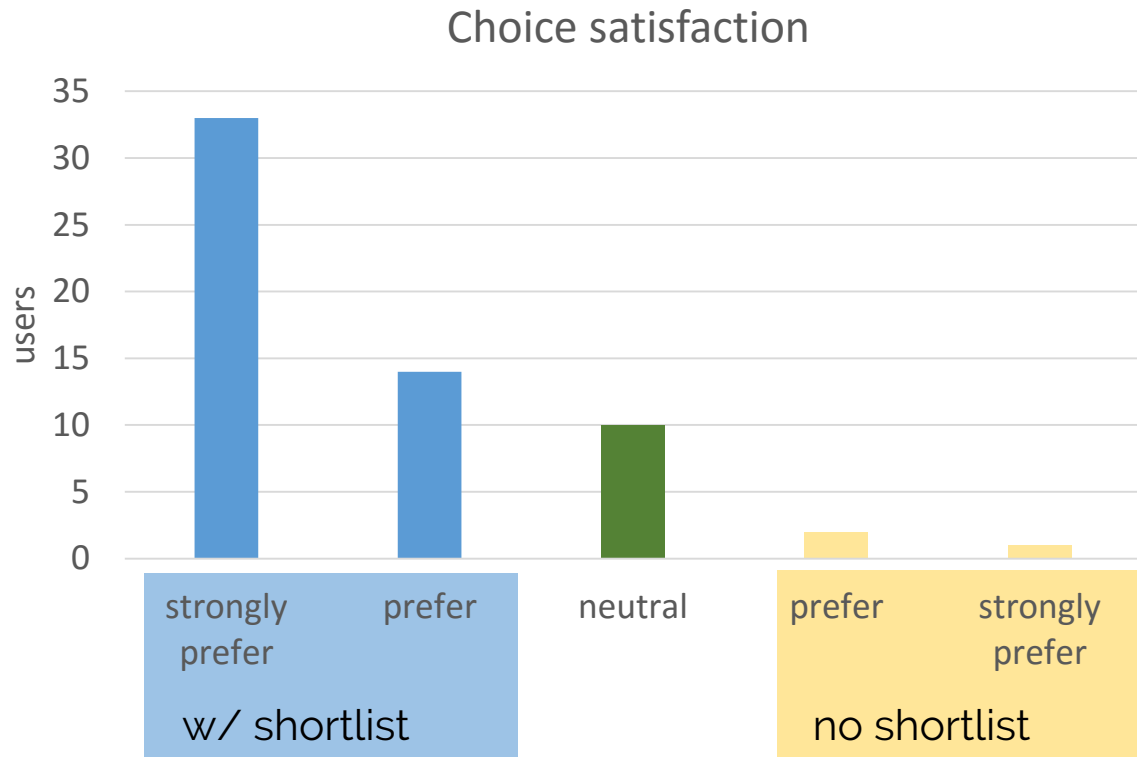
## Do people prefer and use the shortlist interface?



- Shortlists were used in over 93% of all sessions

⇒ People use shortlists and they prefer them

Are users more satisfied with their choices?



⇒ People feel more satisfied with their choices

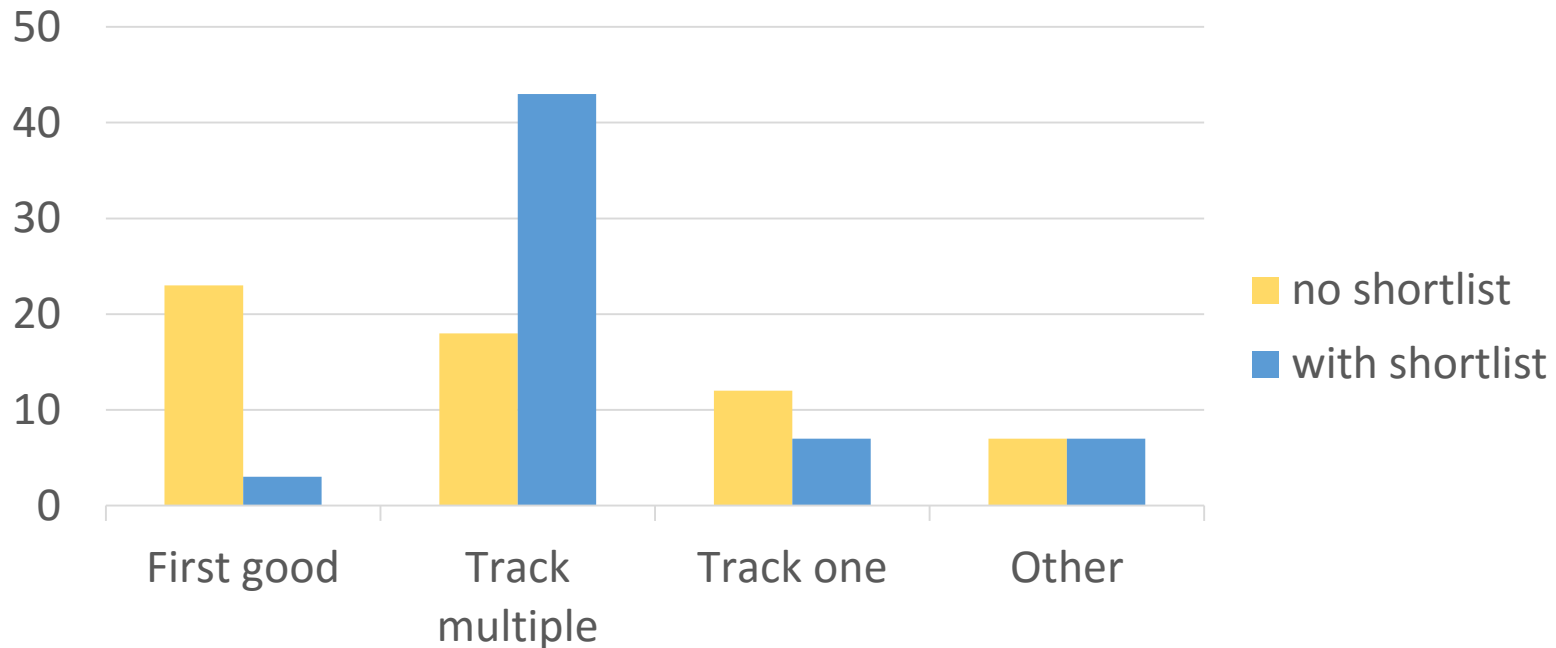
Are users happier with their choices?

“

*Still, I can't help but feel more confident in the options I chose with the first interface [w/ shortlist].*

*I couldn't even point out which ones here were selected in the first interface, but the process of filtering to my top 5 choices - and then to my single winner - in each round really made me confident that I wasn't losing track of a good movie in the shifting sands of my short-term memory.*

## How do users adapt their strategies?



- Effects are more pronounced when shortlists come first
- ⇒ With shortlists, people satisfice less, optimize more
- ⇒ Lower cognitive load with shortlists

## Shortlists lead to more interaction

- Number of movies with interactions:
  - Without shortlist: 2.75 (examined)
  - With shortlist: 5.71 (examined or shortlisted)

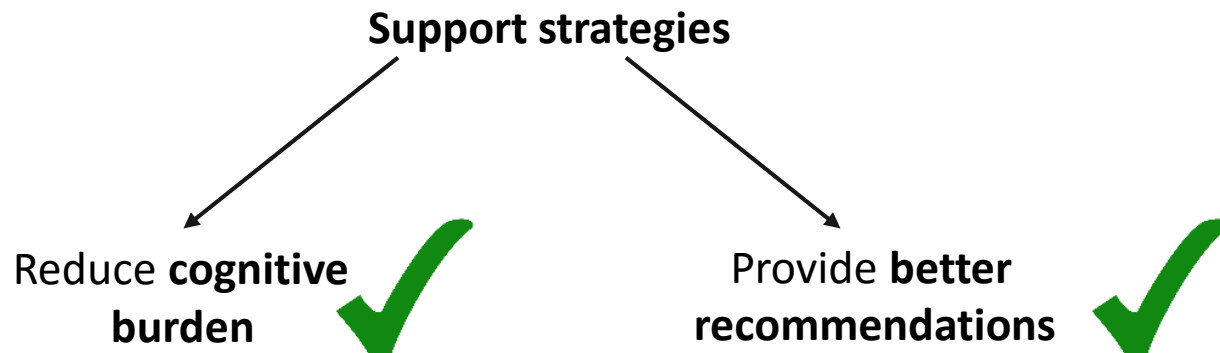
⇒ More than twice the amount of training data!

## Do shortlists lead to better recommendations?

- **Training data:** displayed movies in a session
  - **Prediction task:** rank chosen movie to the top
  - Learning algorithm: Ranking SVM
  - Feedback:
    - *No Shortlist: Examined > Skipped*
    - *Shortlist: {Examined, Shortlisted} > Skipped*
  - Test data: chosen movie + 99 random movies
  - **Results:**
    - MRR (random): 0.052
    - MRR (learning no shortlist): 0.063
    - MRR (learning with shortlist): 0.119
- } Small improvement
- } Large improvement

## Session-based decision making

- **Why is making a decision hard here?**
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## Conclusions

- **Digital memory is a valuable** asset since it eases cognitive burden
- Shortlists:
  - Improved user satisfaction
  - Increased engagement and interaction data
  - Improved recommendations
- **Design** recommender systems **holistically!**

