Using Shortlists to Support Decision Making and Improve Recommender System Performance

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Hungry?
Session-based decision making

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

Support strategies
- Reduce cognitive burden
- Provide better recommendations
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)
Hungry?

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Exploring - without memory
Exploring - with memory
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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.
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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):

1. 1
2. 2
3. 3
4. 4

with shortlist

5. 5
6. 6
7. 7
8. 8

no shortlist

Flight 2 (shortlist last):

1. 1
2. 2
3. 3
4. 4

no shortlist

5. 5
6. 6
7. 7
8. 8

with shortlist
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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Support strategies

- Reduce **cognitive burden**
- Provide **better recommendations**
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**!