Effects of Position Bias on Click-**Based Recommender Evaluation**

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Overview

Evaluation of recommender systems has long focused on *explicit* feedback, where users rate items.

Much more data can be collected when considering implicit feedback, such as clicks.

Interfaces for collecting explicit and implicit feedback for different RS.

nttp://www.movielens.org/		
m o v i e l e n s helping you find the <i>right</i> movies	Welcome katja.hofmann@gmail.com (Log Out) You've rated 6 movies. You're the 23rd visitor in the past hour.	★★★★ = Must See ★★★★☆ = Will Enjoy ★★★☆☆ = It's OK ★★☆☆☆ = Fairly Bad ★☆☆☆☆ = Awful

What is the relationship between using explicit and implicit feedback for recommender system evaluation ?

Experiments

- Given evaluation with explicit feedback, predict online performance (measured) using implicit feedback).
- Compare recommender systems: random baseline (RND), popularity-based (ItemPop), item-based (IB), matrix factorization (MF), user-based (UB).
- Compare evaluation with explicit and implicit feedback:
 - **explicit feedback** nDCG and Precision on explicit labels
 - **implicit feedback** clickthrough rate (CTR) with user models: no-bias, examination and browsing models with logarithmic and quadratic discount (exam-{log,quad}, browse-{log,quad}), and cascade model with low and high stop probability (cascade-{low,high}).
- Tasks: (1) rank recommender systems and check agreement; (2) predict "online

	MovieLens needs Please ra	So far you have rated 6 movies. at least 15 ratings from you to generate predictions for you. ate as many movies as you can from the list below.
	Your Dating	next >
???	Not seen V	Payback (1999) Action, Thriller
****	4.0 stars ∨	Boys Don't Cry (1999) Drama
???	Not seen 🗸	Fast Times at Ridgemont High (1982) Comedy, Drama, Romance
****	3.5 stars V	Cell, The (2000) Drama, Horror, Thriller
???	Not seen 🗸	Bill & Ted's Excellent Adventure (1989) Adventure, Comedy, Sci-Fi
???	Not seen \checkmark	Chicago (2002) Comedy, Crime, Drama, Musical
???	Not seen 🗸	Hackers (1995) Action, Adventure, Crime, Thriller
???	Not seen 🗸	Jungle Book, The (1994) Adventure, Children, Romance
???	Not seen 🗸	Multiplicity (1996) Comedy
???	Not seen 🗸	Under Siege 2: Dark Territory (1995) Action
	То	get a new set of movies click the next> link.



performance" (based on implicit feedback) from evaluation with explicit ratings on MovieLens 1M data (with 80-20 test / train split).

Results

- Implicit and explicit evaluation agree well when assumptions agree well (e.g., precision@10 and CTR with no-bias).
- Match between assumption on user behavior and explicit evaluation matters if assumptions are violated, the wrong recommender system can be preferred.

Overview of results. Precision and CTR scores for the tested RS are shown for selected user models.





0.00 0.05 0.10 0.15 -0.005 0.000 0.005

Precision

Residuals

Open questions

- How to use explicit labels for RS development before implicit feedback can be collected?
- How to obtain guarantees on performance with implicit labels, given offline evaluation with explicit labels?
- How to deal with missing explicit labels?



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