

1-4(a): Taxonomy of Recommender Systems (part 1 of 2)

Learning Objectives

- To understand the different types of recommender systems
 - A framework for analyzing recommender systems in general
 - A specific overview of different recommendation algorithms
- To acquire a roadmap for the rest of the course, based on the algorithms studied

Analytical Framework

- Dimensions of Analysis
 - Domain
 - Purpose
 - Recommendation Context
 - Whose Opinions
 - Personalization Level
 - Privacy and Trustworthiness
 - Interfaces
 - Recommendation Algorithms

Domains of Recommendation

- Content to Commerce and Beyond
 - News, information, “text”
 - Products, vendors, bundles
 - Matchmaking (other people)
 - Sequences (e.g., music playlists)
- One particularly interesting property
 - New items (e.g., movies, books, ...)
 - Re-recommend old ones (e.g., groceries, music)

pagerank - Google Search

www.google.com/#gs_rn=17&gs_ri=psy-ab&cp=5&gs_id=i&xhr=t&q=pagerank&es_nrs=true&pf=p&output=search&scient=psy-ab&oq=pager&gs_l=&pbx=

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[PageRank - Wikipedia, the free encyclopedia](#)
en.wikipedia.org/wiki/PageRank
PageRank is a link analysis algorithm, named after Larry Page and used by the Google web search engine, that assigns a numerical weighting to each element ...
HITS algorithm - Google Toolbar - Rajeev Motwani - Webgraph

[Google PageRank Checker - Check Google page rank instantly](#)
www.prchecker.info/check_page_rank.php
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NET - FREE TOOL TO CHECK GOOGLE PAGE RANK ! Google PageRank (Google PR) is one of the methods Google uses to determine a page's relevance or ...
[Check PageRank - SEO - Google Penalty Recovery ...](#) - [Add Our Free Page Rank ...](#)

[What Is PageRank - PageRank Explained - Google - About.com](#)
google.about.com > ... > [Search Engine Optimization](#)
by Marziah Karch - in 6,474 Google+ circles
PageRank is what Google uses to determine the importance of a web page. It's one of many factors used to determine which pages appear in search results.

[PageRank - Toolbar Help](#)
<https://support.google.com/toolbar/answer/79837?hl=en>
Mar 29, 2013 - Pause your cursor over the PageRank button to display the importance of the webpage you're viewing according to Google. Webpages with a ...

[Chrome Web Store - PageRank Status](#)
<https://chrome.google.com/webstore/detail/pagerank-status/lhbdkkrfheoksdnpiabehmonph>

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Hover and click to magnify, click again to zoom.



The Lexicographer's Extended Scrabble.

This is the version of Scrabble with nearly twice the squares and letters as the standard game to extend play for true lexicon aficionados. With a 21 x 21 grid—441 spaces—this board provides Scrabble enthusiasts more room to unload their letter tiles than the traditional 15 x15 grid, possibly to modify an opponent's Scrabble-legal QUANT into a devastating QUANTIFY Quadruple Word Score. To facilitate extended game play, this set includes 200 plastic letter tiles, twice as many as a standard game, which also allows cruciverbalophiles to create words not possible with standard Scrabble. The 14 1/2" square game board can be angled and rotated so all players get an equally clear view, yet has pegs around each letter space that hold tiles firmly in place. For two to four players. Ages 8 and up. 2" H x 14 1/2" W x 14 1/2" L. (3 lbs.)

Description

Reviews ★★★★★

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The Giant Monopoly Game.



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The World's Largest
Scrabble Game.

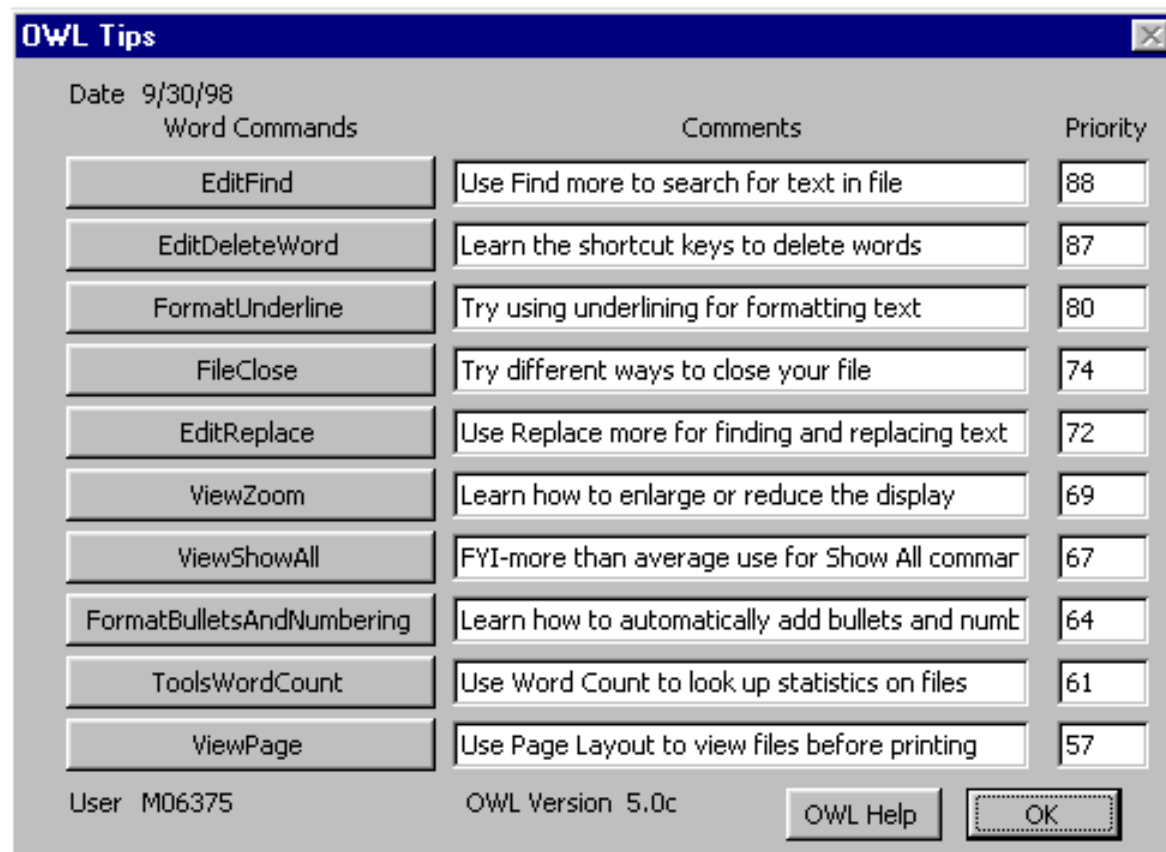
Introduction to Recommender Systems

★★★★☆ 4.6 (based on 11 reviews)

Purposes of Recommendation

- The recommendations themselves
 - Sales
 - Information
- Education of user/customer
- Build a community of users/customers around products or content

OWL Tips





Eleanor Steinman and Ramesh Jain are friends with reviewers of Mandarin Oriental, Las Vegas

Mandarin Oriental, Las Vegas ★★★★★

Special Offer 3rd Night Free



Ranked #1 of 271 hotels in Las Vegas

★★★★★ 1,798 reviews

"a truly deserve 1st place !!" 06/27/2013

"oasis of tranquility" 06/27/2013

Professional photos | Traveler photos (951) | Map

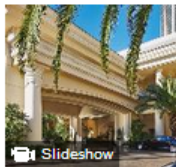
Price Your Stay



Elizabeth Churchill and Dan Bodenheimer are friends with reviewers of Four Seasons Hotel Las Vegas

Four Seasons Hotel Las Vegas ★★★★★

Special Offer USD 100 Hotel Credit



Ranked #2 of 271 hotels in Las Vegas

★★★★★ 2,016 reviews

"Superior Hotel on the Vegas Strip" 06/28/2013

"Luxury in Sin City" 06/28/2013

Professional photos | Traveler photos (648) | Map

Price Your Stay

Staybridge Suites Las Vegas ★★★★★

Special Offer Save on Hotel Packages!



Ranked #3 of 271 hotels in Las Vegas

★★★★★ 431 reviews

"Best hotel!" 06/26/2013

"Very Nice Hotel off the strip" 06/25/2013

Professional photos | Traveler photos (225) | Map

Price Your Stay

ARIA Sky Suites



Ranked #4 of 271 hotels in Las Vegas

★★★★★ 210 reviews

"A unique thing of beauty." 06/28/2013

"Serene retreat above the Vegas Strip" 06/27/2013

Traveler photos (121) | Map



★★★★★ 3,600 Reviews
30% off room rate



Comfort Inn Airport
★★★★★ 141 Reviews
Free Breakfast and Wi-Fi

View all Special Offers in Las Vegas

Top picks in Las Vegas



Bellagio Las Vegas
★★★★★ 5,761 Reviews
Las Vegas, NV

Show Prices



Venetian Resort Hotel Casino
★★★★★ 8,884 Reviews
Las Vegas, NV

Show Prices



Mandarin Oriental, Las Vegas
★★★★★ 1,798 Reviews
Las Vegas, NV

Show Prices

f Friends' activity nearby



The Strip



Andrew Fetterer rated this attraction
★★★★★



Springs Preserve



J B Lawton III likes this attraction

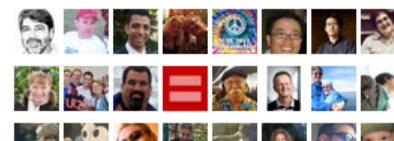


Bellagio Fountains

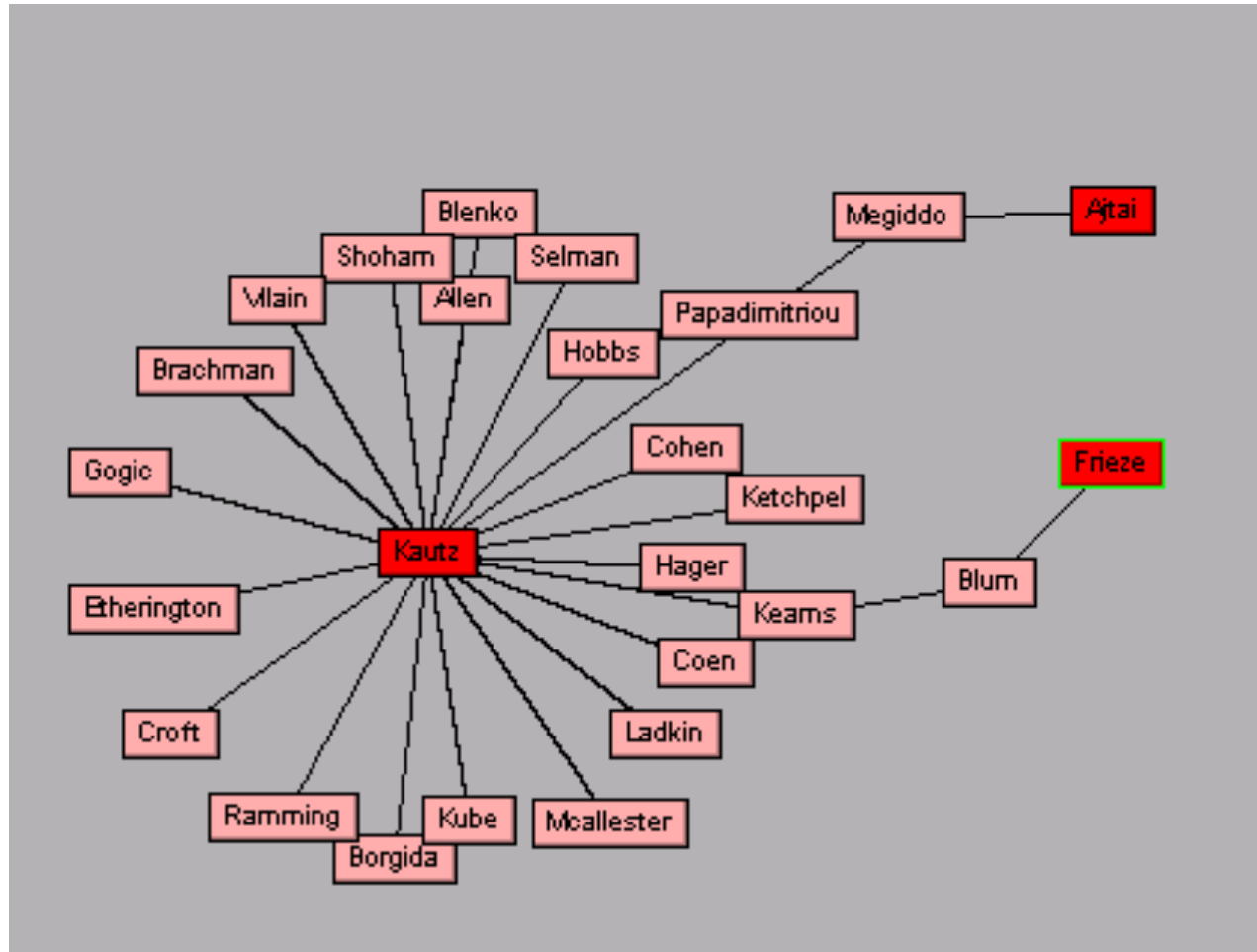


Andrew Fetterer rated this attraction
★★★★★

f 37 friends have been to Las Vegas & nearby towns



ReferralWeb



Recommendation Context

- What is the User doing at the time of recommendation?
 - Shopping
 - Listening to Music
 - Hanging out with other people
- How does the context constrain the recommender?
 - Groups, automatic consumption (vs. suggestion), level of attention, level of interruption?

Now Playing Music Feed My Profile

Shuffle

Billy Joel Radio

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options >



Billy Joel Radio

From here on out we'll be exploring other songs and artists that have musical qualities similar to Billy Joel. This track, "Goodbye Yellow Brick Road" by Elton John, has similar mellow rock instrumentation, a subtle use of vocal harmony, acoustic rhythm piano, intricate melodic phrasing and mixed acoustic and electric instrumentation.

Goodbye Yellow Brick Road
by Elton John
on Goodbye Yellow Brick Road

Publish

Share...

Buy

Lyrics

When are you gonna come down
When are you going to land
I should have stayed on the farm
I should have listened to my old man

show more

About Elton John

In terms of sales and lasting popularity, Elton John was the biggest pop superstar of the early '70s. Initially marketed as a singer/songwriter, John soon revealed he could craft Beatlesque pop and pound out rockers with

full bio

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Casa Lapostolle

1997 Casa Lapostolle Cabernet Sauvignon, Rapel Valley, Chile

Lapostolle's 1997 Cabernet Sauvignon is quite ripe and delicious, showing the soft tannins and easy-drinking profile needed to pair with everything from meatloaf to spaghetti and meatballs.

\$9.95

[Add to Cart](#)[Add to My Wish List](#)

Peter's Tasting Chart

intensity ▶	delicate -----●-----	powerful
dry or sweet ▶	bone dry -----●-----	dessert
body ▶	light body -----●-----	very full body
acidity ▶	soft, gentle -----●-----	very crisp
tannin ▶	none -----●-----	heavy tannins
oak ▶	none -----●-----	heavy oak
complexity ▶	direct -----●-----	very complex

Casa Lapostolle, a partnership between French and Chilean winemaking families, is one of the newer wineries in Chile but they clearly know how to make fine wine. A red that rewards regular visits, Casa Lapostolle's 1997 Cabernet Sauvignon is so juicy, easy to drink, and affordable that you may want to buy it by the case. Ripe flavors of cassis and plum fruit are aligned within a delicate frame of oak and a long, silky tannic finish that's perfect for everyday home-style comfort foods. The tannins are soft enough and the

Our Wine Experts Recommend...

[1997 Domaine Bascou Vin de Pays d'Oc \(Cabernet Sauvignon\), France](#)

A thoroughly modern, international-style red.
\$9.95 ▶

[1997 Meridian Cabernet Sauvignon, California](#)

A mouthful of ripe black cherry fruit.
\$11.00 ▶

[1998 Errazuriz Cabernet Sauvignon El Ciego Estate, Aconcagua Valley, Chile](#)

A deliciously ripe and complex Cabernet Sauvignon.
\$8.95 ▶

Related Wines

[Cabernet Sauvignon](#)[Casa Lapostolle](#)[Chile](#)

People Helping One Another Know Stuff

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* Searches for posted web pages that contain any of the above words

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Frequently Mentioned Resources

Resource Title	Distinct Posters	Click on Bars for Message Context(s) *
1) Bob Dylan - Bob Links	23	...
2) Bob Dylan Chords	9	
3) RemarQ - The Internet's Best Collaboration...	8	
4) bobdylan.com: Bob Dylan	7	
5) CDNOW	6	
6) Mailing List WWW Gateway	6	
7) Deja.com	4	
8) LC Z39.50 Server Soft Reference	4	
9) Resource at www.cs.umass.edu	4	
10) Sidewalk	4	

* Note: each square represents the posting of one resource (e.g., URL) by one person. The lighter the square, the more recent the post. Click on a square to view messages where this resource was mentioned. Posting a web resource does not necessarily imply endorsing that resource. Sometimes it may actually mean the opposite. Consult the relevant netnews messages to obtain context.

Personalization Level

- Generic / Non-Personalized
 - Everyone receives same recommendations
- Demographic
 - Matches a target group
- Ephemeral
 - Matches current activity
- Persistent
 - Matches long-term interests



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Important Notice!

Lands' End has agreed to be acquired by Sears.

Read the [announcement by Lands' End CEO David Dyer](#), and see the companies' [joint press release](#).



Lands' End Custom

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- [Men's Custom Chinos](#)
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- [Women's Custom Chinos](#)

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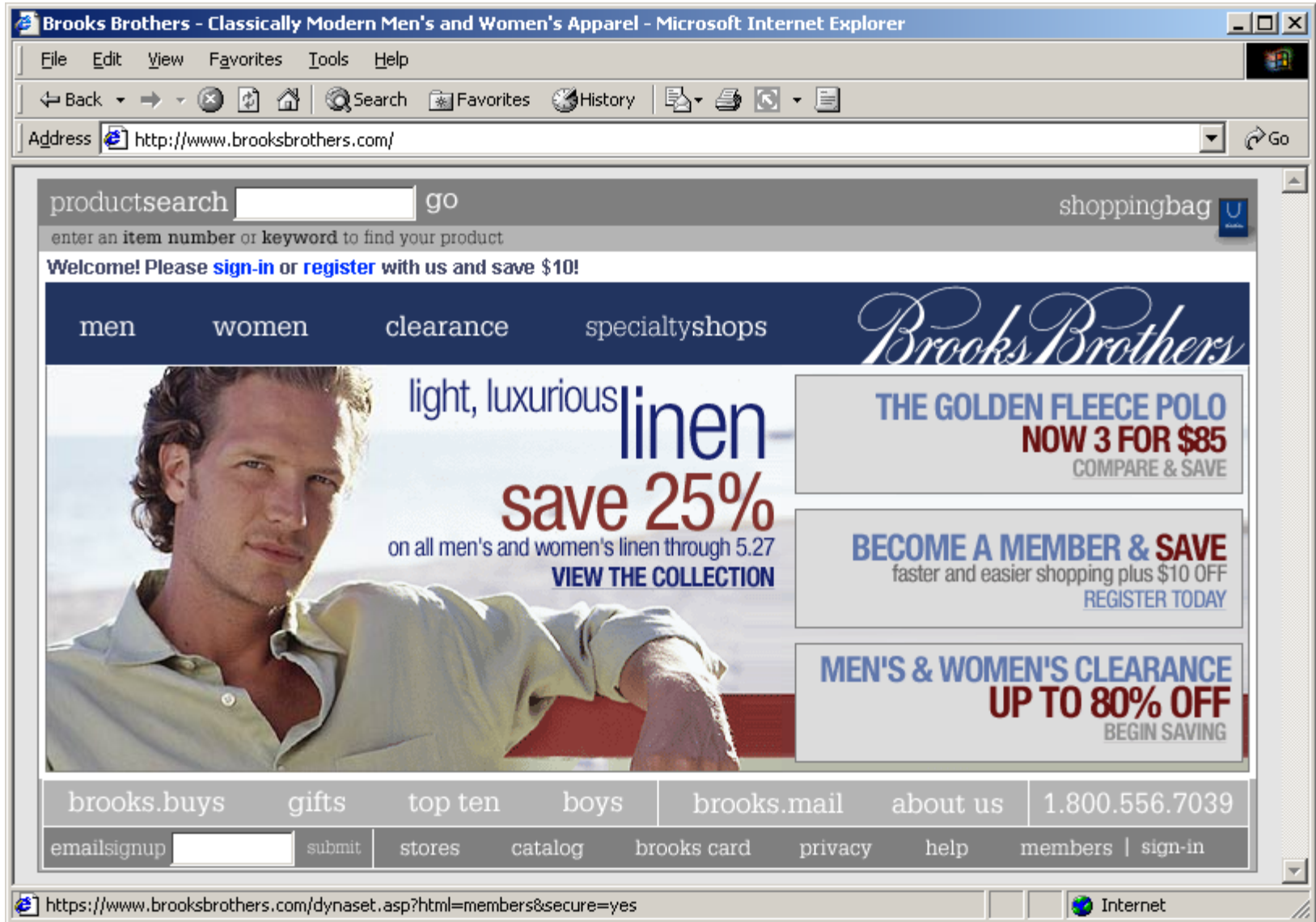
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PREFERENCES

Customize your

Privacy and Trustworthiness

- Who knows what about me?
 - Personal information revealed
 - Identity
 - Deniability of preferences
- Is the recommendation honest?
 - Biases built-in by operator
 - “business rules”
 - Vulnerability to external manipulation
 - Transparency of “recommenders”; Reputation

Interfaces

- Types of Output
 - Predictions
 - Recommendations
 - Filtering
 - *Organic vs. explicit presentation*
 - Agent/Discussion Interface
- Types of Input
 - Explicit
 - Implicit

Recommendation Algorithms

- Non-Personalized Summary Statistics
- Content-Based Filtering
 - Information Filtering
 - Knowledge-Based
- Collaborative Filtering
 - User-User
 - Item-Item
 - Dimensionality Reduction
- Others
 - Critique / Interview Based Recommendations
 - Hybrid Techniques