Recommender Systems: Personalizing Commerce and Building Communities

Joseph A. Konstan
John Riedl

GroupLens Research Group
Department of Computer Science and Engineering
University of Minnesota
{konstan,riedl}@cs.umn.edu
http://www.cs.umn.edu/Research/GroupLens
Introduction
The Problem: Overload
Too much stuff!

Too many messages!

Too many journal articles!

Too many movies!

Too much content!
Recommenders

Tools to help identify worthwhile stuff

- Filtering interfaces
  - E-mail filters, clipping services

- Recommendation interfaces
  - Suggestion lists, “top-n,” offers and promotions

- Prediction interfaces
  - Evaluate candidates, predicted ratings
Scope of Recommenders

Purely Editorial Recommenders

Content Filtering Recommenders

Collaborative Filtering Recommenders

Hybrid Recommenders
Objectives

When you leave, you should ...

- Have a sense of the range of recommender applications
- Understand 4 of the 8 principles of putting recommender systems into practice
- Understand the history and future trajectory of recommender systems
History of Recommender Systems
The Early Years …

Why cave dwellers survived

Critics, critics, everywhere

How editors are like cave dwellers
Information Retrieval

Static content base
- Invest time in indexing content

Dynamic information need
- Queries presented in “real time”

Common approach: TFIDF
- Rank documents by term overlap
- Rank terms by frequency
Information Filtering

Reverse assumptions from IR
- Static information need
- Dynamic content base

Invest effort in modeling user need
- Hand-created “profile”
- Machine learned profile
- Feedback/updates

Pass new content through filters
Collaborative Filtering

Premise

- Information needs more complex than keywords or topics: quality and taste

Small Community: Manual

- Tapestry – database of content & comments
- Active CF – easy mechanisms for forwarding content to relevant readers
Automated CF

The GroupLens Project (CSCW ’94)

- **ACF for Usenet News**
  - users rate items
  - users are correlated with other users
  - personal predictions for unrated items

- **Nearest-Neighbor Approach**
  - find people with history of agreement
  - assume stable tastes
17107 Cream Brulee
17108 Mop Sauce
17109 Banana Cream Pie
17110 Baked Potato Soup
17111 Minestrone
17112 Apple Pandowdy
17113 XLebkuchen
17114 XPlum Clafoutis
17115 XSwedish Flatbread

Operations apply to current selection or cursor position

From: "Art Poe" <apo@Unicom.net>
Subject: Cream Brulee
Organization: Unicom

MasterCook export; Cream Brulee

Recipe By: Food and Wine - Dec95
Serving Size: 8
Preparation Time: 0:100
Categories: Desserts

<table>
<thead>
<tr>
<th>Amount</th>
<th>Measure</th>
<th>Ingredient</th>
<th>Preparation Method</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Cups</td>
<td>Heavy Cream</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>Vanilla bean</td>
<td>Salt</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Egg yolks</td>
<td>Sugar</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Tablespoons</td>
<td>Sugar</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Tablespoons</td>
<td>Brown sugar</td>
<td></td>
</tr>
</tbody>
</table>

Preheat the oven to 300F. In a heavy medium saucepan, combine the cream, vanilla bean and salt. Warm over moderate heat until the surface begins to shimmer, about 5 minutes. In a large bowl, stir the egg yolks and sugar until blended. Pour the hot cream and stir gently to avoid forming air bubbles. Strain the custard into a large measuring glass and skin off any surface air bubbles. (Rinse the vanilla bean and reserve for future use.) Place 8 3/4-cup ramekins in a roasting pan. Pour the custard into the ramekins, filling them up to the rim. Place the roasting pan in the oven and pour in enough warm water to reach halfway up the sides of the ramekins. Cover loosely with foil and bake for 1 1/4 hours, or until the custard is firm around the edges. (It may still be wobbly in the center but it will firm up as it chills.) Remove the ramekins from the...
ACF Blossomed

1995
- Ringo (later Firefly)
- Bellcore Video Recommender

1996 Recommender Systems Workshop

Early commercialization
- Agents Inc. (later Firefly)
- Net Perceptions

new issues of scale and performance!
Today

Broad research community
- live research systems
- substantial integration among:
  - collaborative filtering
  - machine learning
  - non-ML information filtering

Increasing commercial application
- available commercial tools
Introductions

Joe Konstan
◆ Human-computer interaction

John Riedl
◆ Collaborative computing

Disclaimers …
Agenda

Introduction
Recommender Systems Application Space
Technology Taxonomy
Eight Principles
The Future of Recommender Systems
Application Space
Recommender Application Space

Dimensions of Analysis

- Domain
- Purpose
- Whose Opinion
- Personalization Level
- Privacy and Trustworthiness
- Interfaces
- <Algorithms Inside>
Content to Commerce

- News, information, “text”
- Products, vendors, bundles
Purposes of Recommendation

The recommendations themselves

- Sales
- Information

Education of user/customer

Build a community of users/customers around products or content
A higher standard for MiniDisc recording.

Capable of recording 74 minutes of music at CD-like quality, MiniDiscs are a great choice for home recording. And Kenwood's recorder has pushed the standard beyond the typical digital bit rate, all the way to 24-bit recording. The results are recordings that capture the subtlest details of any CD, right down to the ambiance of the room in which the recording was made.

Virtually no digital distortion: Kenwood's exclusive DRIVE II™ circuitry.
Kenwood's proprietary DRIVE II™ technology is the only circuitry available that essentially removes the digital distortion recorded into all CD's. The proof is in the listening: you'll hear an openness that sounds as if musicians are performing live, right there in the room.

Why carry dozens of CD's? Record what you like on one MiniDisc in CD quality! Up to 74 minutes of music per disc gives you plenty of space - as well as instant track access, repeat, and scan. With Kenwood's full line of MiniDisc products for home, car, and personal listening, you can take your music anywhere.

**Main Features**
- **MiniDisc Recorder** plays and records digital quality MiniDiscs. MiniDisc recordings give you incredible fidelity, unsurpassed convenience, and amazing portability - because one pocket-sized blank disc can fit up to 74 minutes of music. MiniDiscs also offer handy features allowing you to combine, erase, move, divide, or title tracks however you choose.
- **CD Text Transfer via Direct Digital Connection** Kenwood's MiniDisc recorder not only records the audio of your selection, but also transfers information about artist or track title if present in CD Text format. If the CD doesn't contain CD Text information, you can name the disc and tracks of the recording yourself.
- **10-Second MD Shock Proof Memory** provides electronic shock protection when playing your MDs, so there's no skipping when the unit is bumped or jiggled. Especially important when recording!

**Audio Features**
- **MD Recording Convenience** Minidisc offers many advantages over cassettes, with the flexibility and convenience of a digital format. Using the Track Naming, Quick Moving, and Quick Erasing features of the unit, create custom digital-quality discs, placing the tracks in any order you choose. Sample your favorite tracks from CD's, DAT, or other digital sources, or record from any source you like...
KnowledgeMail™

Fully Automated Knowledge Discovery and Exchange

KnowledgeMail transforms enterprise e-mail into an automatic strategic information asset that helps everyone connect to the people and information they need.
Whose Opinion?

“Experts”

Ordinary “phoaks”

People like you
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

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 homestyle comfort foods. The tannins are soft enough and the alcohol is mild.
Personalization Level

Generic
- Everyone receives same recommendations

Demographic
- Matches a target group

Ephemeral
- Matches current activity

Persistent
- Matches long-term interests
It makes looking good look easy.

The slimming Faille Tankini – just $58!

AS SEEN ON TV!

The magic word is Faille (say it "file"). It's a revolutionary ribbed fabric that feels slimming and comfortable.

With a liberating – yet discreet – 2-piece style, our Faille Tankini works its magic at a very down-to-earth price: $58.

Want a pile of faille? See all of our slimming Faille favorites.

Let Swim Finder locate your perfect suit!

 Quickly sorts through hundreds of Suits by:

- Body Shape
- Anxiety Zones
- Leg Height
- Bra Style
- 18W-26W
- Mastectomy
- and more!

It's fast…it's fun! Try Swim Finder today! Or, visit Swim HQ to see new styles, swim separates and more.
Album Advisor™
Tell us what you like and we'll make several recommendations. Great for buying gifts or broadening your musical horizons.

To start, enter the names of up to three artists below and click on the Recommend button.

gordon bok
enya

Recommend
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
Interfaces

Types of Output
- Predictions
- Recommendations
- Filtering
- *Organic vs. explicit presentation*

Types of Input
- Explicit
- Implicit
Launching Organic Interfaces

Launch.yahoo.com – a truly personal radio station

- Observes play limits
- Mixes different inputs, different recommenders
- Kill a song – once and forever
- Nice information on why a song is playing
LAUNCHcast Home - Microsoft Internet Explorer

- Hard Rock
- Classic Rock
- Adult Alternative
- R&B
- Rap
- Country
- Electronica
- Jazz
- Billie Holiday
- Boney James
- Charles Mingus
- Charlie Parker
- Chick Corea
- David Sanborn
- Diana Krall
- Duke Ellington
- Ella Fitzgerald
- George Benson
- John Coltrane
- Louis Armstrong
- Medeski Martin & Wood
- Miles Davis
- Pat Metheny
- Stan Getz

- Blues
- Latin

Add Your Own Favorite Artists: (Optional)
LAUNCHcast

STATIONS: My Station

Tunji
John Coltrane
Coltrane (1957)

BUY ALBUM

FIND LYRICS You rated this song's genres

masters artist
DEFINING MUSIC
Technology Taxonomy
MovieLens

Research system to recommend movies

- Uses ratings from users
- Non-profit, unbiased
- Database includes tens of thousands of users, millions of movie ratings

Illustrate typical features and technology
Welcome to MovieLens, konstan@cs.umn.edu

Have you ever wanted to get movie recommendations for a group of friends or relatives? Now you can with MovieLens! Try groups now:

- Learn more about groups!
- Create a group! New: invite friends who aren’t yet MovieLens users!
- View/Edit Groups you are already in

Just want to rate some movies? Use the “Get Recommendations” at the top of the page to select a set of movies you would be interested in rating. Any movie you get a recommendation for, you can rate.

Our privacy statement last changed on April 26, 2000.

We have many movie reviews in our database, and will be adding more every week!

- List all DVD reviews
- List all general reviews

Here are the 100 most recent additions to our movie database.
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MovieLens is a free service provided by GroupLens Research at the University of Minnesota.
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<tbody>
<tr>
<td>★★★★★</td>
<td>? unseen</td>
<td>Comedy, Romance</td>
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<td>Comedy</td>
<td>Freedom for Us (À nous la liberté) (1931)</td>
<td></td>
<td></td>
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<tr>
<td>★★★★★</td>
<td>? unseen</td>
<td>Comedy, Drama, Romance</td>
<td>City Lights (1931)</td>
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<tr>
<td>★★★★★</td>
<td>? unseen</td>
<td>Comedy, Romance</td>
<td>Still Breathing (1994)</td>
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<td></td>
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<tr>
<td>★★★★★</td>
<td>? unseen</td>
<td>Comedy</td>
<td>General, The (1927)</td>
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<td></td>
</tr>
<tr>
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<td>Comedy</td>
<td>Gold Rush, The (1925)</td>
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<tr>
<td>★★★★★</td>
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<td>Comedy, Drama</td>
<td>Vie est belle, La (Life is Rosey) (1967)</td>
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<tr>
<td>★★★★★</td>
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<td>Comedy, Romance</td>
<td>Shop Around the Corner, The (1940)</td>
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<td>★★★★★</td>
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<td>Bringing Up Baby (1938)</td>
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<td>Yojimbo (1961)</td>
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<td>Comedy</td>
<td>Modern Times (1936)</td>
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<tr>
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<td>Almost Famous (2000)</td>
<td></td>
<td></td>
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<td>Wrong Trousers, The (1993)</td>
<td></td>
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<td>Little Big Man (1970)</td>
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<tr>
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<td>Comedy</td>
<td>Tampopo (1985)</td>
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<tr>
<td>★★★★★</td>
<td>? unseen</td>
<td>Animation, Comedy, Thriller</td>
<td>Close Shave, A (1995)</td>
<td></td>
<td></td>
</tr>
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Rating more movies improves your predictions; you've rated 36 so far.
Currently displaying Comedy movies released anytime.
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<td>★★★★★</td>
<td>? unseen</td>
<td>Comedy, Drama</td>
<td>Vie est belle, La (Life is Rosey) (1957)</td>
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<tr>
<td>★★★★★</td>
<td>? unseen</td>
<td>Comedy, Romance</td>
<td>Shop Around the Corner, The (1940)</td>
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<td>? unseen</td>
<td>Comedy</td>
<td>Modern Times (1936)</td>
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<td></td>
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<tr>
<td>★★★★★</td>
<td>? unseen</td>
<td>Comedy, Drama</td>
<td>Almost Famous (2000)</td>
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<td></td>
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<tr>
<td>★★★★★</td>
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<td>Animation, Comedy</td>
<td>Wrong Trousers, The (1993)</td>
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<tr>
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<td>? unseen</td>
<td>Comedy, Drama</td>
<td>Little Big Man (1970)</td>
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<td>Comedy</td>
<td>The Chicken (1936)</td>
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<td>★★★★★</td>
<td>? unseen</td>
<td>Animation, Comedy</td>
<td>Close Shave, A (1995)</td>
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</table>
Rating more movies improves your predictions; you've rated 36 so far.
Currently displaying Comedy movies matching the search string "Children".

<table>
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<td>Drama</td>
<td>Children Are Watching Us, The (Rabbi dei guardiano, i)</td>
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<tr>
<td>★★★★★</td>
<td>? unseen</td>
<td>Drama</td>
<td>Children of Heaven, The (Racheh Ya Agmon) (1957)</td>
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<tr>
<td>★★★★★</td>
<td>? unseen</td>
<td>Drama, Romance</td>
<td>Children of Paradise (Les enfants du paradis) (1945)</td>
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<td>Horror, Thriller</td>
<td>Children of the Corn (1954)</td>
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<td>Horror</td>
<td>Children of the Corn III (1994)</td>
<td></td>
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</table>
"ANGELA'S ASHES"

Directed by Alan Parker
Written by Frank McCourt
Produced by David Brown
Starring Emily Watson & Robert Carlyle

All reviews are based on a 5 star rating.

During this summer, we have been swept up as a nation by the likes of such reality shows as "Survivor" and "Big Brother". Not many of us want to admit that we are turned on by the lives and perils of fellow human beings, but the truth is we are. Who knows why? Perhaps it is because it helps us as individuals, realize that we are not the only ones to have problems, or maybe it is because we are looking to identify with other people that may be like us in certain ways. I'm not going to pretend to know the reasons, but one thing that I do know is that I am affected in the same way as the countless others in this country by the phenomenon. Not only do I enjoy a good argument on 'Survivor' or a sexual discussion on 'Big Brother', but I also like a film that is based on a true story of a 'regular joe'. "Angela's Ashes" was just that kind of film. It opened a window into the life of a young Irish boy named Frank McCourt.

Frank McCourt has become one of our nation's most read authors in the last few years, and "Angela's Ashes" is the story of his life. It is the book that began his writing career and the film that brought that book to life. Frank, his parents (Emily Watson and Robert Carlyle) and siblings lived out a hard existence in a poor Irish community named Limerick, a place where the rain never seems to stop. We watch as Frank loses some of his siblings to disease and hunger, and his mother Angela deals with the situation of a husband who is more concerned about drinking boozes than providing for his large family. Frank eventually grows up to be an intelligent and caring individual, and this story is his way of saying thank you to his mother and forgiving his father.
<table>
<thead>
<tr>
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<th>GROUP</th>
<th>YOUR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Almost Famous (2000)</td>
<td>Comedy, Drama</td>
<td>⭐⭐⭐⭐⭐⭐⭐</td>
<td>⭐⭐⭐⭐⭐⭐⭐</td>
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<tr>
<td>Nurse Betty (2000)</td>
<td>Comedy, Thriller</td>
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<td>⭐⭐⭐⭐⭐⭐⭐</td>
<td>⭐⭐⭐⭐⭐⭐⭐</td>
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<tr>
<td>Five Senses, The (1999)</td>
<td>Drama</td>
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<td>Replacements, The (2000)</td>
<td>Comedy</td>
<td>⭐⭐⭐⭐⭐⭐</td>
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<td>⭐⭐⭐⭐⭐⭐⭐</td>
</tr>
<tr>
<td>Saving Grace (2000)</td>
<td>Comedy</td>
<td>⭐⭐⭐⭐⭐⭐</td>
<td>⭐⭐⭐⭐⭐⭐⭐</td>
<td>⭐⭐⭐⭐⭐⭐⭐</td>
</tr>
<tr>
<td>Bring It On (2000)</td>
<td>Comedy</td>
<td>⭐⭐⭐⭐⭐⭐</td>
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<tr>
<td>I am Sam (2001)</td>
<td>Comedy</td>
<td>⭐⭐⭐⭐⭐⭐</td>
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<tr>
<td>Girl on the Bridge, The (La Fille sur le Pont) (1999)</td>
<td>Drama, Romance</td>
<td>⭐⭐⭐⭐⭐⭐</td>
<td>⭐⭐⭐⭐⭐⭐⭐</td>
<td>⭐⭐⭐⭐⭐⭐⭐</td>
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<tr>
<td>Wonderland (1999)</td>
<td>Drama</td>
<td>⭐⭐⭐⭐⭐⭐</td>
<td>⭐⭐⭐⭐⭐⭐⭐</td>
<td>⭐⭐⭐⭐⭐⭐⭐</td>
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<tr>
<td>Chuck &amp; Buck (2000)</td>
<td>Comedy, Drama</td>
<td>⭐⭐⭐⭐⭐⭐</td>
<td>⭐⭐⭐⭐⭐⭐⭐</td>
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<td>Sid, The (2001)</td>
<td>Comedy</td>
<td>⭐⭐⭐⭐⭐⭐</td>
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<tr>
<td>Me, Myself and Irene (2000)</td>
<td>Comedy</td>
<td>⭐⭐⭐⭐⭐⭐</td>
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Rating more movies improves your predictions; you’ve rated 36 so far.
Currently displaying all movies at the box office in the last three months for group Joe & Jon.
C.F. Engine

Ratings

Correlations
GroupLens Model

C.F. Engine

Ratings

Correlations
GroupLens Model

- Ratings
- Correlations

C.F. Engine

request
GroupLens Model

C.F. Engine

Ratings
Correlations

Neighborhood
GroupLens Model

C.F. Engine

Ratings
Correlations

Neighborhood

ratings
requests
predictions
recommendations
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MISRC and III Seminar Series – September 13, 2002
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</table>
Automated Collaborative Filtering

- Finds community of common interest
- Uses ratings (of some sort)
- Generates:
  - Recommendations of what items you’ll like
  - Predictions of how much you’ll like an item
  - Communities of common interest
More Broadly

Inputs
Outputs
Recommender Technologies
Explicit and Implicit User Preferences

- Ratings
- Keyword/Attributes
- Purchase History
- Navigation

Community Inputs

- Reviews
- Popularity
- Classifications
Outputs

Types of Output

- Suggestion
- Prediction
- Ratings and Reviews

Delivery

- Push
- Pull
- Passive
Technologies

Manual / Hand Picks
Searchable Database
Customer Segmentation
Statistical Summarization
Social Navigation
Custom, Proprietary Recommenders
Machine Learning – Model Based
Information Filtering
Collaborative Filtering
Combinations
Eight Principles for Personalizing Your Business

Illustrated by Case Studies
The Eight Principles

1. Demonstrate Product Expertise
2. Be a Customer Agent
3. Maintain Excellent Service Across Touchpoints
4. Box Products, Not People
5. Watch What I Do
6. Revolutionize Knowledge Management
7. Use Communities to Create Content
8. Turn Communities into Content
Principle 1.
Demonstrate Product Expertise
Key Ideas

Use expertise and recommenders to build customer trust

Provide deep product data, so that customers can make informed decisions

Make it fun!
Examples

Priceline Hotels

Ticketmaster and Hockey

Entrée – a FindMe System

See’s Candies
Select the areas in Minneapolis - St. Paul where you'd be willing to stay. Priceline will search for a hotel at your price in the area(s) you select. Remember, you'll always stay in a nationally recognized name-brand or well-known independent hotel.

- Airport (MSP) - Mall of America [Details]
- Downtown Minneapolis [Details]
- Eagan [Details]
- Minneapolis North [Details]
- Minneapolis West [Details]
- Roseville [Details]
- Southwest Minneapolis [Details]
- St. Paul [Details]
- University - Metrodome [Details]
- Woodbury [Details]
- Select All Zones

[See full area map below]

The areas in Minneapolis - St. Paul are highlighted in the map below.

You can click on an area for a closer look.
The following price guidelines show you what you might pay if you did not book your hotel room through priceline. The range of rates shown below should be used as a general guideline only. Actual available rates may be higher or lower than the ranges stated. Factors such as holidays, major events, and the day of the week can all influence rates. Remember, at priceline we want you to save by getting your hotel room(s) at the best price of all - yours!

<table>
<thead>
<tr>
<th>Star Level</th>
<th>Rating</th>
<th>Average rates that you would expect to pay in Minneapolis without using priceline</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Star</td>
<td>Economy</td>
<td>$68 - $72</td>
</tr>
<tr>
<td>2 Star</td>
<td>Moderate</td>
<td>$86 - $105</td>
</tr>
<tr>
<td>3 Star</td>
<td>Upscale</td>
<td>$122 - $145</td>
</tr>
<tr>
<td>4 Star</td>
<td>Deluxe</td>
<td>$121 - $151</td>
</tr>
</tbody>
</table>

Here are the 4 easy steps we recommend to name your own price:

1. Shop around for the lowest available hotel rates before you name your price.
2. If the lowest rate you find fits your budget in a hotel you want to stay in, we recommend that you reserve those rooms, since rates and availability change constantly.
3. If not, let priceline try to find available high quality hotel rooms for you, at the price you want to pay.
4. Remember, the more reasonable your price, the better your chance of getting hotel rooms through priceline.com.

Priceline.com, Inc. is a seller of travel in the State of California (CST 2040505-50). Registration as a seller of travel does not constitute approval by the State of California.

1 STAR Hotels: Economy

Priceline’s 1 Star hotels are national name-brand and well known independent hotels. These hotels are generally 2-4 stories high and are located near major attractions or convenient intersections, often in close vicinity to restaurants and business/shopping centers.

2 STAR Hotels: Moderate

Priceline’s 2 Star hotels are national name-brand and well known independent hotels with a reputation for offering a consistent level of quality and amenities. Participating hotels are well-regarded, with high customer satisfaction ratings. These hotels are usually located near...
YOU HAVE FIVE MINUTES TO COMPLETE THIS ORDER.

BEST AVAILABLE TICKETS

Event:
MINNESOTA_WILD
XCEL ENERGY CENTER
Friday, September 29, 2000 7:00PM

Area:
END OF ICE THAT OPPONENT SHOOTS AT TWICE
PRICE LEVEL 4
LOWER LEVEL SEATING

Selected Tickets:
SECTION 103, ROW 26, SEATS 8 TO 9

Seating Chart or Map:
Click Here (Chart Will Open In A New Browser)

Selected Pricing:

<table>
<thead>
<tr>
<th>Ticket</th>
<th>Type</th>
<th>Face Value per ticket</th>
<th>Ticketmaster Convenience Charge per ticket</th>
<th>Building Facility Charge</th>
<th>Total per ticket</th>
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<tbody>
<tr>
<td>2</td>
<td>A</td>
<td>64.00</td>
<td>3.76</td>
<td>0.00</td>
<td>67.76</td>
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</table>

Subtotal: 135.00
Ticketmaster Handling Charge: 3.00
Total Charge: 138.50

Delivery Method:
Will-Call

Do you want to purchase these tickets? Yes No

BILLING INFORMATION
The San Francisco restaurant you chose is:

La Folie
2316 Polk St. (bet. Union & Green Sts.), San Francisco, 415-776-5577

French Nouvelle $30-$50

Extraordinary Decor, Extraordinary Service, Near-perfect Food, Catering for Special Events, Hip Place To Be, Parking/Valet, Power Brokers, Prix Fixe Menus, Very Busy - Reservations a Must, Romantic, Fabulous Wine Lists

We recommend:

Yoshi's Cafe
3297 N. Halsted St. (Belmont Ave.), Chicago, 312-248-6100

Asian, Japanese, French (New) $30-$50

Extraordinary Decor, Extraordinary Service, Near-perfect Food, Need To Dress, Prix Fixe Menus, Quiet for Conversation, Very Busy - Reservations a Must, Romantic, Good Out of Town Business, Fabulous Wine Lists, Game, Parking/Valet

For other suggestions, select:

Yoshi's Cafe
Everest
Gambit
Trio

Ambra
Carlos'
La Vichyssos
Le Francais
Monte Rosso
Le P'tit De Paris

New Query
Milk Chocolates

A classic selection of light and delicate milk chocolate coatings over cream, chew, and nut centers.

Pictured above is our 3 lb. box (two layers)

<table>
<thead>
<tr>
<th>Gift#</th>
<th>Description</th>
<th>Price</th>
<th>Qty</th>
<th>Add To Bag</th>
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</thead>
<tbody>
<tr>
<td>326</td>
<td>1 lb. Milk Chocolates</td>
<td>$11.70</td>
<td>0</td>
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<tr>
<td>327</td>
<td>2 lb. Milk Chocolates</td>
<td>$23.40</td>
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<tr>
<td>328</td>
<td>3 lb. Milk Chocolates</td>
<td>$35.10</td>
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</table>
Principle 3.
Maintain Excellent Service Across Touchpoints
Key Ideas

It’s still you however your customers get there

Different strokes for different folks
Alienware PC's Now Offered on Best Buy ``Computer Creation Stations''

Blockbuster

customer identity

privacy issues

Music Store

sampling versus “listening”
Call Centers

Inbound
- “screen-pops”
- Legacy systems
- Appropriateness

Outbound
- Predict who will buy
- Predict what they will buy
- Predict when to contact them
- Online campaign management
Zagat What it Takes

What happened to my favorite guide?

- They let you rate the restaurants!

What should be done?

- Personalized guides, from the people who “know good restaurants!”
“Supercreative” French-Mediterranean cuisine courtesy of two former D’Amico Cucina chefs earns this “charming” Stillwater newcomer enthusiastic foodie support, and the “historic” “storefront” setting is an eye-pleaser; while some speak only of “great promise” and opine it “could be outstanding”, converts are convinced it’s already a “very special” “escape” that’s well “worth the drive.”
Principle 5.
Watch What I Do
Key Ideas

Actions speak louder than words

Determine actions by context

Respond to customers’ reactions to your recommendations
Examples

Google

PHOAKS

Amazon

My Yahoo
Searched the web for google pagerank.

Results 1 - 10 of about 31,600. Search took 0.44 seconds.

Category: Science > Biology > Microbiology > Directories

Google Web Directory - Health > Conditions and Diseases > ...
... Institute (54) Web Pages. Viewing in Google PageRank
order View in alphabetical order. Amgen's Neuopenographie.
directory.google.com/Top/Health/Conditions_and_Diseases/Cancer/ - 15k - Cached - Similar pages

Google Web Directory - Science > Biology > Microbiology
... Micropaleontology (24) Web Pages. Viewing in Google PageRank
order View in alphabetical order. CELLS alive.
directory.google.com/Top/Science/Biology/Microbiology/ - 23k - Cached - Similar pages
[More results from directory.google.com]

welcome to nathan arora's page @ uw
... Elastic using Google's (www.google.com) patented search engine technology. One of
the reasons Google works so well is their patented PageRank TM technology ...
etudes.uwaterloo.ca/~nathan/search.html - 3k - Cached - Similar pages

Geek: google accused of rigging PageRank for Yahoo!
[Data Prev][Data Next][Thread Prev][Thread Next][Date Index][Thread Index]
Geek google accused of rigging PageRank for Yahoo...
www.monkey.org/geschke/archive/2003/msg00030.html - 4k - Cached - Similar pages

Fark Archive: google accused of rigging PageRank for Yahoo!
goog"e" accused of rigging PageRank for Yahoo! ... From:
Kari.Ander\(s\)on (kra@monkey.org) Date ...
exferences.ucl.edu.Fark-\(archive\)-sept\(00\)-0277.html - 4k - Cached - Similar pages
Google PageRank

Ranks pages based on incoming links
Links from higher ranked pages matter more
Combines text analysis with importance to decide which pages to show you
Runs on network of thousands of PCs!
Works to be hard to trick (e.g., citation trading)
PHOAKS

Read Usenet news to find web sites!

- Implicit ratings
- Filter URLs to find endorsements
- Create top-n lists of web sites for a Usenet newsgroup community

Links to endorsements (with age shown)

Tested against hand-maintained FAQ lists
People Helping One Another Know Stuff

Freq  "Together, we know it all."  Feedback

Recently  Top  Recency  Area
Posters  Summary  Help

Search

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


Frequently Mentioned Resources

<table>
<thead>
<tr>
<th>Resource Title</th>
<th>Distinct Posters</th>
<th>Click on Bars for Message Context(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Bob Dylan - Bob Links</td>
<td>23</td>
<td></td>
</tr>
<tr>
<td>2) Bob Dylan Chords</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>3) RemarQ - The Internet's Best Collaboration...</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>4) bobdylan.com: Bob Dylan</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>5) CDNOW</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>6) Mailing List WWW Gateway</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>7) Deja.com</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>8) LC Z39.50 Server Soft Reference</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>9) Resource at <a href="http://www.cs.umass.edu">www.cs.umass.edu</a></td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>10) Sidewalk</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

* 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.
### Amazon: Improve Your Recommendations

To exclude an item from being used for your recommendations, uncheck the "Use to make recommendations" option. Remember to save any changes below when you are done making your selections.

<table>
<thead>
<tr>
<th>Item Number</th>
<th>Title</th>
<th>Rating Options</th>
<th>Use to make recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><em>Stupid White Men... and Other Sorry Excuses for the State of the Nation</em> by Michael Moore</td>
<td><img src="https://example.com/rating1.png" alt="Rating Options" /></td>
<td><img src="https://example.com/use1.png" alt="Use to make recommendations" /></td>
</tr>
<tr>
<td>2</td>
<td><em>The Nanny Diaries</em> by Emma McLaughlin, Nicola Kraus</td>
<td><img src="https://example.com/rating2.png" alt="Rating Options" /></td>
<td><img src="https://example.com/use2.png" alt="Use to make recommendations" /></td>
</tr>
<tr>
<td>3</td>
<td><em>Amangement</em> by Ian McEwan</td>
<td><img src="https://example.com/rating3.png" alt="Rating Options" /></td>
<td><img src="https://example.com/use3.png" alt="Use to make recommendations" /></td>
</tr>
<tr>
<td>4</td>
<td><em>The Ultimate French Review and Practice</em> by David M. Stillman, Ronnie L. Gordon</td>
<td><img src="https://example.com/rating4.png" alt="Rating Options" /></td>
<td><img src="https://example.com/use4.png" alt="Use to make recommendations" /></td>
</tr>
<tr>
<td>5</td>
<td><em>Irish Heartbeat</em> ~ Van Morrison &amp; The Chieftains</td>
<td><img src="https://example.com/rating5.png" alt="Rating Options" /></td>
<td><img src="https://example.com/use5.png" alt="Use to make recommendations" /></td>
</tr>
</tbody>
</table>
Amazon.com - Recommendations: Why? - Microsoft Internet Explorer

DVD Recommendations > Why was I recommended this?

We recommended...

**Crouching Tiger, Hidden Dragon** DVD
~ Yun-Fat Chow
Average Customer Rating: ★★★★★
Our Price: $20.97

Because you purchased or rated...

<table>
<thead>
<tr>
<th>Purchased or Rated Items</th>
<th>Not Rated</th>
<th>Your Rating: Don't like it &lt;</th>
<th>I love it!</th>
<th>Exclude Item</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>The New Joy of Cooking</strong> by Irma S. Rombauer, et al</td>
<td>☉ ☉ ☉ ☉ ☉</td>
<td>☉ ☉ ☉ ☉ ☉ ☉ ☉ ☉ ☉ ☉ ☉</td>
<td>☉ ☉ ☉ ☉ ☉ ☉ ☉ ☉ ☉ ☉</td>
<td>☉ ☉ ☉ ☉ ☉ ☉ ☉ ☉ ☉ ☉</td>
</tr>
<tr>
<td><strong>Cookwise</strong> by Shirley O. Corriher</td>
<td>☉ ☉ ☉ ☉ ☉</td>
<td>☉ ☉ ☉ ☉ ☉ ☉ ☉ ☉ ☉ ☉ ☉</td>
<td>☉ ☉ ☉ ☉ ☉ ☉ ☉ ☉ ☉ ☉</td>
<td>☉ ☉ ☉ ☉ ☉ ☉ ☉ ☉ ☉ ☉</td>
</tr>
<tr>
<td><strong>Essential Talmud</strong> by Adin Steinsaltz</td>
<td>☉ ☉ ☉ ☉ ☉</td>
<td>☉ ☉ ☉ ☉ ☉ ☉ ☉ ☉ ☉ ☉ ☉</td>
<td>☉ ☉ ☉ ☉ ☉ ☉ ☉ ☉ ☉ ☉</td>
<td>☉ ☉ ☉ ☉ ☉ ☉ ☉ ☉ ☉ ☉</td>
</tr>
<tr>
<td><strong>Still Pumped from Using the Mouse</strong> by Scott Adams</td>
<td>☉ ☉ ☉ ☉ ☉</td>
<td>☉ ☉ ☉ ☉ ☉ ☉ ☉ ☉ ☉ ☉ ☉</td>
<td>☉ ☉ ☉ ☉ ☉ ☉ ☉ ☉ ☉ ☉</td>
<td>☉ ☉ ☉ ☉ ☉ ☉ ☉ ☉ ☉ ☉</td>
</tr>
<tr>
<td><strong>Where Wizards Stay Up Late</strong> by Katie Hafner, Matthew Lyon</td>
<td>☉ ☉ ☉ ☉ ☉</td>
<td>☉ ☉ ☉ ☉ ☉ ☉ ☉ ☉ ☉ ☉ ☉</td>
<td>☉ ☉ ☉ ☉ ☉ ☉ ☉ ☉ ☉ ☉</td>
<td>☉ ☉ ☉ ☉ ☉ ☉ ☉ ☉ ☉ ☉</td>
</tr>
</tbody>
</table>
Principle 7.
Use Communities to Create Content
Key Ideas

Editorial process is value added

Free is better than paying for it
  ◆ customers trust what they produce

Reward creatively
Epinions.com - Reviews of 2000 Toyota Sienna - Microsoft Internet Explorer

Home > Autos & Motorcycles > Autos > 2000 Toyota Sienna

Love It / Hate It
Feel strongly about this item? Add it to your profile page as a most or least favorite product. This will help other users get to know you better.

Love it! Hate it!

Get Updates
Send me email alerts when new opinions on '2000 Toyota Sienna' appear

Send me alerts

Go Shopping!
Find out where to buy this item.

$ Find out where to buy this item.

Related Items
- 2001
- 2000

Epinions Sienna overview

Average rating: ★★★★★ (62 Member Opinions)

Recommended 93% of the time

2000 Toyota Sienna
Current Est. Price: $20730-27334
Manufacturer: Toyota
Class: Van & Minivan
Model Years: 2000
Model Pictured: XLE 4 Dr Pass Van

More Detailed Information

The 2000 Sienna is now offering fewer option packages in comparison to last year's model. The dual......

[ More Information ]

Member Opinions

Write an Opinion

Toyota Sienna: Try to Find a better minivan
by JMB623 (Aug 30 '99)
Product rating: ★★★★★
We bought the 1998 Sienna, knowing that it's usually sheer stupidity to buy the first year release of most vehicles. But Toyota R & D's this one...

Quiet, comfortable ride
by istrick! (Dec 22 '99)
Product rating: ★★★★★
My husband and I bought this vehicle because we were ready to give ourselves and our almost teenage boys more room on trips. We have an SUV and love...

a great mini-van
by dannelas (May 16 '00)
Product rating: ★★★★★
When we were shopping for a mini-van, we had a lot of input from friends. I have owned 2 Toyota Camry's and I was very satisfied with the quality...

Read all 62 Member Opinions -->

Professional Reviews

Suggest a Link

1999 Toyota Sienna XLE
by Activusa.com

Highly Recommended

See What's New

Latest Reviews
Epinions Profile

JMB623's Public Profile

Opinions written: 75  |  Member visits: 4712  |  Total visits: 30108

Epinions ID: JMB623
Gender: Male
Member since: Jul 12, 1999
Email: jmblaw@mindspring.com

Favorite Web Sites:
http://www.pcwin.com
http://www.epinions.com
http://www.pcmag.com/utilities

Interests:
My almost 4-year old daughter, technical writing, computers, Internet, motorcycles.

About JMB623:
I am a lawyer by day and a geek by night. Computers and software became a serious passion a few years ago, and I have immersed myself in fooling with them ever since. I learned a lot about operating systems and device drivers by tweaking Windows 95 until I wiped it out. I replaced it with Windows 98 and wiped that out a few times, but still run it.

I taught myself to do hardware and software installations the hard way (by screwing up), and began to do beta testing and software reviews about a year ago. I have written articles and software reviews for www.pcwin.com. I've also answered a lot of user posted questions for the HP Deskjet 895C on HP's 895C

Whom should I trust?

Web of Trust

Trust JMB623's opinions!

Distrust JMB623's opinions!

JMB623 trusts:
1. thin
2. Mike Geezer
3. tom
4. icare
5. Collectorman
24 other members

more...

JMB623 distrusts:
none vat

JMB623 is trusted by:
1. HonestisKey
2. ldayave
3. asdd
4. chrisrb
5. olympiakos97
204 other members
15 hidden members

more...

Send me email alerts on opinions by JMB623
Send me alerts when JMB623 writes new comments

Get Updates
Epinions profile

Love It

> Autos & Motorcycles
   1. 20th Century
   2. Ford Festiva
   3. Toyota Sienna
   4. BMW K Series
   5. 2000 Harley Davidson FXST

> Computers & Internet
   1. Nasc Software Paint Shop Pro
   2. NetObjects Fusion
   3. It Utilities
   4. Adaptec GoBack
   5. Magellan Corporation Winboost
   more...

> Web Services
   1. Stamps.com
   2. Eletter

Hate It

> Autos & Motorcycles
   1. State Farm
   2. Nationwide

> Computers & Internet
   1. Earthlink

> Electronics
   1. AT&T (T1)

Opinions written by JMB623

<table>
<thead>
<tr>
<th>Date</th>
<th>Title</th>
<th>Reviewed Product</th>
<th>Product Rating</th>
<th>Category</th>
<th>Opinion Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>08/20/00</td>
<td>ACDSee 3.0: Professional Image Slinger</td>
<td>ACDSee</td>
<td>*****</td>
<td>Computers &amp; Internet</td>
<td>Highly Recommended</td>
</tr>
<tr>
<td>08/13/00</td>
<td>HP 6300 Series: Fastest Scan in the West</td>
<td>HP ScanJet 6300C</td>
<td>*****</td>
<td>Computers &amp; Internet</td>
<td>Highly Recommended</td>
</tr>
<tr>
<td>07/16/00</td>
<td>Plextor’s Fast And Reliable CD-RW Reads 32X, W 8X, RW 4X</td>
<td>Plextor PlexWriter 8/4/32</td>
<td>*****</td>
<td>Computers &amp; Internet</td>
<td>Highly Recommended</td>
</tr>
<tr>
<td>07/04/00</td>
<td>Powerstitch Can Make An Artist Out of Almost Anyone!!</td>
<td>Powerstitch</td>
<td>*****</td>
<td>Computers &amp; Internet</td>
<td>Highly Recommended</td>
</tr>
<tr>
<td>06/29/00</td>
<td>Internet Cleanup Obliterates Your Trail</td>
<td>Internet Cleanup</td>
<td>*****</td>
<td>Computers &amp; Internet</td>
<td>Highly Recommended</td>
</tr>
<tr>
<td>04/17/00</td>
<td>Speednet or Science Fiction??</td>
<td>Paramagnus Development Speednet 4</td>
<td>*****</td>
<td>Computers &amp; Internet</td>
<td>Highly Recommended</td>
</tr>
<tr>
<td>04/07/00</td>
<td>BullsEye 2 Pro: Meta-search King of the Hill</td>
<td>BullsEye</td>
<td>*****</td>
<td>Computers &amp; Internet</td>
<td>Highly Recommended</td>
</tr>
<tr>
<td>03/28/00</td>
<td>Pretty-up Your Monitor Display</td>
<td>Displaymate</td>
<td>*****</td>
<td>Computers &amp; Internet</td>
<td>Highly Recommended</td>
</tr>
</tbody>
</table>
$100 in Calling Card Calls!

johntr's account
Member since: Jul 17, 2000
Email: riedl@cs.umn.edu

Opinions summary
Opinions
Opinions written: 2
Member visits: 6
Total visits: 8

Earnings Summary
Opinion Royalties: $0.14
Income Share: $0.12
Other: $0.00
Total Earnings: $0.26

Requested email alerts: 4
- New opinions: 0
- New comments: 0

Content Filters
- Highly Recommended
- Recommended

Web of Trust
you trust: [edit]
you distrust: [edit]
you are trusted by:
1. JMB623

Love It / Hate It
Your Love It! / Hate It! list is currently empty. We encourage you to share
Stop Waiting. Start Living. Go Meet Somebody!

Members Login
FREE TRIAL

Your FREE Trial includes:
- Safe, private, anonymous email
- Over 80 location or affinity groups
- A custom profile with photos

Preview Members
1. I am: A Man Looking for: Women
2. Choose a group: MN - Minneapolis OR Catholic Singles
3. Search Postal/ZIP: 55108 within 25 miles
4. Minimum Age: 21 - 25 Maximum Age: 36 - 40

Matchmaking since 1985. Over 8 million members to date.

Matchmaker: Affiliate Program | Email us | Advertise

Matchmaker.com - The most entertaining place to meet new people.

MISRC and III Seminar Series – September 13, 2002
The Future of Recommenders
Please login.
login:

OK ALPHA
Please login.

login: [redacted]
Please select a choice:
1 Recommend All
2 Recommend Comedies
3 Recommend SciFi

Recommend!
5 My Life in Pink (Mélie en rose) (1997)
5 Fandango (1985)
5 Holiday Inn (1942)
4.5 Kolya (1996)
4.5
Back
Privacy versus Personalization
Some Stories

Cdnow email
privacy

- No business has failed because of privacy
  but ...
- Consumers beginning to wake up
- Government beginning to wake up
- EU has protections in place already
Consumer Profiles

Microsoft Wallet
- Remembers logins
- Credit cards and addresses, too
- Sites must support

Novell DigitalMe
- Remembers logins
- Recognizes forms on sites, and fills them out

Product preference information, too!
P3P from W3C

Web Server → Personalization Engine

Profile Data

Privacy Policy

Profile Parser

User Profile
Where are the Profiles?

Web client

Web server

Encrypt

Smart Card

PDA
Who Pays the Agents?

Price Bots

◆ Junglee (Excite), Jango (Amazon), MySimon

Opinion Leaders

◆ Deja.com (Half.com), AskIda (Best Buy), Epinions

Recommenders

◆ Owned by businesses
Microsoft Hailstorm

P3P approach to Privacy
Microsoft volunteers to keep the profiles

Consumer response?
- No one cares

Business response!
- Not with our customers!
Consumer Desires

If Only I could Bring this Shopping!

You will love Attack of the Giant Leeches!

I have 20,000 Copies

If Only I could Bring this Shopping!
Consumer Desires

Recommendations wherever I am
Recommendations that I can trust
Control over what preferences I share
Control over who I share with
Recommendations Unplugged

Experimental questions
• How do users interact?
• What usage patterns?
• What happens as users gain experience?
• How do different modalities compare?
• How does usage compare with web?

What movie should I see?

Wireless PDA

What DVD should I buy?

Avant Go

What good movies are close by?

WML

Tell me what I should see!

Voice
Peer-to-Peer Recommenders

Builds on model based item-item algorithm

Separate model construction from usage

Key Question: How to find neighbors?

Incrementally build a model just for me
Commercial Tools
Tools

Data mining for offline analytics
Campaign management so marketer has something to do
Personalization for real-time decision-making
Dynamic content for Web site Dynamic Content + Personalization

Approach: Goals, Relate to Recommender Systems, Sample Vendors
Commercial Tools

Goals

• Analyze customer and traffic data to drive business decisions
• Simplify deployment of analytic solutions
• “Close the loop” between the marketer and the customer
Commercial Tools

Goals

- Run inbound and outbound campaigns
- Derive more revenue from customers
- Evaluate campaign performance
Commercial Tools

Goals

- Recommend products or content to site visitors
- Help customers find value from site
- Create strong relationships with customers
Commercial Tools

Goals

- Produce HTML content from database
- Simplify authoring, editing, and management of site
- Support interactivity and personalization

Data Mining  Campaign Mgmt  Personalize  Dynamic Content
Holy Grail

Combine technologies across entire spectrum

- Data mining for offline analytics
- Campaign management to drive marketing decisions to customers
- Personalization for real-time decision-making
- Dynamic content for Web site
Recommender System for User

Find what I want
Know I will like it
Trust system to help me
Team up with my friends to defeat evil marketers
Recommender System for Marketer

Show people what they will buy
Learn what people want so you have it
Learn how much they want it so you charge as much as possible
Who will Prevail?

Who is deploying recommender systems?
Who has the money?

Consumers will react if tricked
Alternatives exist, and will be deployed if necessary
Recommender Systems

- Becoming necessary for e-commerce
- Create value for businesses
- Create value for customers
- Many open research problems
  - Technology
  - Deployment
  - Effectiveness
Questions and Discussion