A Survey of Explanations in Recommender Systems
Introduction

- Expert Systems
- CBR
- ⇒ Recommender Systems ⇐
Questions

What makes good explanations?
How to measure the quality of explanations?
How to use explanations in recommender systems?
Customers Who Bought This Item Also Bought

The Last Man on the Moon: Astronaut ...
  Eugene Cernan
  Kindle Edition
  $9.99

Forever Young: A Life of Adventure in Air and ...
  John W Young
  Kindle Edition
  $10.59

Falling to Earth: An Apollo 15 Astronaut's ...
  Al Worden
  Kindle Edition
  $11.19

Apollo
  Catherine Bly Cox
  Kindle Edition
  $9.99

Failure Is Not an Option: Mission ...
  Gene Kranz
  Kindle Edition
  $13.11
These recommendations are based on items you own and more.

view: All | New Releases | Coming Soon

1. **The Docker Book: Containerization is the new virtualization**
   by James Turnbull (July 12, 2014)
   Average Customer Review: ★★★★★ (17)
   Auto-delivered wirelessly
   **Kindle Price: $9.99**

2. **Node.js the Right Way: Practical, Server-Side JavaScript That Scales**
   by Jim R. Wilson (January 10, 2014)
   Average Customer Review: ★★★★★ (22)
   Auto-delivered wirelessly
   **Kindle Price: $12.49**
Aims of Explanations

- Transparency
- Scrutability
- Trust
- Effectiveness
- Persuasiveness
- Efficiency
- Satisfaction
Transparency

Explain how the system works!

"If TiVo Thinks You Are Gay, Here’s How to Set It Straight" - Article in Wall Street Journal

How was the recommendation chosen?
These recommendations are based on items you own and more.

view: All | New Releases | Coming Soon

1. **The Docker Book: Containerization is the new virtualization**
   by James Turnbull (July 12, 2014)
   Average Customer Review: ★★★★★  (17)
   Auto-delivered wirelessly
   **Kindle Price: $9.99**

   I own it  Not interested  Rate this item
   Recommended because you purchased Real World OCaml: Functional programming for the masses and more (Fix this)

2. **Node.js the Right Way: Practical, Server-Side JavaScript That Scales**
   by Jim R. Wilson (January 10, 2014)
   Average Customer Review: ★★★★★  (22)
   Auto-delivered wirelessly
   **Kindle Price: $12.49**

   I own it  Not interested  Rate this item
   Recommended because you purchased Real World OCaml: Functional programming for the masses and more (Fix this)
Scrutability

Allow the users to tell the system it is wrong

Follows by transparency
These recommendations are based on items you own and more.

1. **The Docker Book: Containerization is the new virtualization**
   by James Turnbull (July 12, 2014)
   Average Customer Review: ★★★★★ (12)
   Auto-delivered wirelessly
   Kindle Price: $9.99

   [I own it] [Not interested] [Rate this item]

   Recommended because you purchased Real World OCaml: Functional programming for the masses and more

2. **Node.js the Right Way: Practical, Server-Side JavaScript That Scales**
   by Jim R. Wilson (January 10, 2014)
   Average Customer Review: ★★★★★ (22)
   Auto-delivered wirelessly
   Kindle Price: $12.49

   [I own it] [Not interested] [Rate this item]

   Recommended because you purchased Real World OCaml: Functional programming for the masses and more
Recommended for You

The Docker Book: Containerization is the new virtualization
by James Turnbull (July 12, 2014)
Auto-delivered wirelessly
Kindle Price: $9.99

Because you purchased...

Real World OCaml: Functional programming for the masses (Kindle Edition)

Effective Programming: More Than Writing Code (Kindle Edition)

Java Code in The Real World: The Good Parts (Kindle Edition)
Trust

Increase users’ confidence in the system

A user can have more trust in a system they know how work.
Persuasiveness

Convince users to try or buy

Greater chance for buying if the users see the reasoning behind the recommendation.
Effectiveness

Help users make good decisions.

Greater chance of giving a correct recommendation.

Explanations may assist users to make better decisions.
Efficiency

Help users make decisions faster.

Find the haystack in the needle.

“This camera compared to that: Less Memory and Lower Resolution and cheaper”
Satisfaction

Make the use of the system fun

Using a recommendation system should be fun.
How to evaluate an explanation

Online testing!
Usability.
Ask the user
Surveys and tasks.
How to evaluate an explanation

Trade-offs
Transparency VS Efficiency
Persuasiveness VS Satisfaction
and so on.
Presentation

The presentation of the recommendations changes the explanations.
Top Item

Offer the best item.

"You have been watching a lot of sports, and football in particular. This is the most popular and recent item from the world cup."
Top N items

Show the top N items.

“You have watched a lot of football and technology items. You might like to see the local football results and the gadget of the day.”
Similar items

"You might also like...Oliver Twist by Charles Dickens"

"People like you liked..Oliver Twist by Charles Dickens"
Predicted ratings

Show ratings while browsing.
Structured overview

Show trade-offs between items.

”[these laptops]...are cheaper and lighter, but have lower processor speed”
Recommender “Personality”

Affirming - Gives Trust
Novel/Surprising - Satisfaction

Two dimensions:
  Strength
  Confidence
Interacting

Making the system scrutable
Let the user make changes
User: I feel like watching a thriller.
System: Can you tell me one of your favorite thriller movies.
User: Uhm, I’m not sure
System: Okay. Can you tell me one of your favorite actors or actresses?
User: I think Bruce Willis is good
System: I see. Have you seen Pulp Fiction?
User: No
System: Pulp Fiction is a thriller starring Bruce Willis
The user asks for an alteration

See how items compare

Getting a list of flights and be able to see how different criterias change what are returned
The user rates items

Show ratings and influence for recommendations
Let the user change the ratings
The user gives their opinion

Specify whether an item is interesting or not.

Give me more like this

No more like this
Conclusion

What are the explanations trying to achieve
Explanations are linked with the presentation of recommendations.
Linked with the degree of interactivity offered