Social Navigation

Peter Brusilovsky
School of Information Sciences
University of Pittsburgh
http://www.sis.pitt.edu/~peterb

Social Navigation in Real World

“…without knowing much, we joined the longest existing queue formed for a sushi restaurant. looking at faces of people (both young and old) filled with expectations despite the long wait in the cold weather, we were sure that the food would be worth every minute of waiting time. well, it was”. (A comment on Flickr image, used in Rosta Farzan’s Thesis)
Social Navigation in Real Life

What would you do...?

- Walking by the cinema you feel like watching a movie, but none of the movies seems familiar.
- You missed a lecture and want to do your readings. You have a textbook and 100 assigned pages to read, but do not know what was most important in the lecture and what can be skipped.
- You are hiking along a trail to a famous waterfall. You reached an unmarked road split and you have no map.

Social Navigation

- Natural tendency of people to follow each other.
  Making use of “direct” and “indirect cues about the activities of others.
- Following trails:
  - Footsteps in sand or snow
  - Worn-out carpet
- Using dogears and annotations
- Giving direction or guidance.
- Navigation that is conceptually understood as driven by the actions from one or more advice provider.
Social Navigation vs. General Navigation

Walking down a path in forest
Walking down a road in a city

Reading a sign at the airport to find the baggage claim
Talking to a person at the airport help desk to find the baggage claim

The Lost Interaction History

What is the difference between walking in a real world and browsing the Web?
- Footprints
- Worn-out carpet
- People presence

What is the difference between buying and borrowing a book?
- Notes in the margins
- Highlights & underlines
- Dog-eared pages
- Opens more easily to more used places
### Social Navigation in Information Space

<table>
<thead>
<tr>
<th>Synchronous</th>
<th>Asynchronous</th>
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<td>Indirect</td>
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<td>Chats</td>
<td>Presence of other people</td>
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<td>Forums</td>
<td>History-enriched environments</td>
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### Direct Asynchronous SN

- Asynchronous discussion forums
- Recommending information to friends and community
- Directly asking questions for getting information
- Sharing bookmarks with others
Umtella: Direct Asynchronous SN

EDUCO: Synchronous, Indirect SN
Amazon: Asynchronous, Indirect

• Compare with an Amazon review: “the remake of this movie is horrible, I recommend to watch the original version instead”

SN in Information Space: The History

- History-enriched environments
  - Edit Wear and Read Wear (1992)
  - Social navigation systems
    - Footprints, Juggler, Kalas

- Collaborative filtering
  - Manual push and pull
    - Tapestry, LN Recommender
  - Modern automatic CF recommender systems

- Social bookmarking
  - Collaborative tagging systems

- Social Search
Edit Wear and Read Wear (1992)

The pioneer idea of asynchronous indirect social navigation

Developed for collaborating writing and editing

Indicated read/edited places in a large document

The Pioneers: *Footprints*

Wexelblat & Maes, 1997
Allowing users to create history-rich objects
Providing History-rich navigation in complex information space
Contextualizing Web pages
  - Maps
  - Path view
  - Annotations
  - Signposts
**Footprints: Maps**

Showing the traffic through a website
- Nodes
  - Documents
- Links
  - Transition between them
  - Tracking transition from all possible sources
  - Selecting a link
  - Typing a URL
  - Selecting a bookmark
- Externalization of users’ mental model

**Footprints: Annotations**

Showing what percentage of users have followed each link

Link-centric social navigation approach

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**Research Groups**

- Aesthetics and Computation (8%)
- Affective Computing
- Electronic Publishing
- Epistemology and Learning
- Explanation Architecture
- Gesture & Narrative Language
- Interactive Cinema
- Machine Listening
- Machine Understanding (8%)
- Micromedia
- Object-Based Media
- Opera of the Future
- Personal Information Architecture
- Physics and Media
- Sociable Media
- Software Agents
Footprints: Signposts

Allowing users to enter feedback
  On pages
  On paths
    “go this way for software agents; go that way for artificial life”

Viewing comments left by other users

How we can classify this social navigation?

The Pioneers: Juggler

Dieberger, 1998
Textual virtual environment (MOO)
History-enriched environment
  Showing access-counter for rooms
Recognizing URLs in the output of a communication tool
  Hiding it from user
  Popping out the page
  Integrating with social navigation
Supporting interaction between teachers and students
Ideas for Social Navigation on WWW

Awareness of presence of other users
- Discussion of an article
- Location attracting large crowds of users

Relevant objects
- Links visited by similar users
- Items appreciated by similar users

Recency
- How long ago the page was created/visited

Attitude
- What other users did/thought about an item

Example: CoWeb
More Advanced Projects

Which users’ actions are taken into account for personalization?
- All users
- Coherent, like-minded group of users

Group-level social navigation
- KnowledgeSea II
- CourseAgent
- CoFIND

Knowledge Sea II

Assisting students finding educational resources on the web

Social Navigation
- Traffic based
  - Using intensity of colors to present footprints of other students
    - Distinguishing the most and the least visited pages
- Annotation based
  - Using visual cues to present students’ annotation activity
    - magnitude of group annotation activity
    - presence of learners annotation
    - magnitude of individual annotation activity
CourseAgent

Adaptive community based course recommendation system
  Provides personalized access to course information
  Provides social recommendation about courses
Recommendation in the form of in-context adaptive annotation
  Visual cues
    Expected course workload
    Expected relevance to students’ career goals

Course Schedule

Course Catalog
Course Catalog

CoFIND

Collaborative bookmark database
Self-Organized Database of Resources

Combination of usage and explicit ratings causes the system to dynamically and continuously reorganize its resources.
Stigmergy

Communication via the environment

Nature
Ant trails
  - leave a trail of pheremones when find food and return to the nest
  - The trail gets stronger, attracting more ants

CoFIND
Successful topic groups, topics, qualities and resources tend to grow more successful, influencing patterns of behavior for all users of the system

Challenges

Concept drift
Snowball effects
Bootstrapping
Concept Drift

Old history information becomes less relevant

- History decay
  - different for a very popular and a less popular information

Shift of Interest

Snowball effect

Just one visit before the current visit can turn the page into ‘hot’

- The page could be useful or useless
- Next users follow the same path

Snowball gets bigger and bigger
Bootstrapping

Social navigation works with many users
What if there are very few users?
How to match a new user against already populated system?
How to encourage users to leave their trails (commenting, ...)?
How to make the new information visible in already populated system?

Discussion