What do you do?

Walking by the cinema you feel like watching a movie, but none of the movies seems familiar.
What do you do?

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
    - Human or animal
    - Direction of travel
    - Speed of travel
- 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

Social Navigation in Information Space

- Collaborative filtering
- Recommender systems
- History-enriched environment
Interaction History

What is the difference between buying and borrowing a book?
Same object
Same words
Same organization, ...

Interaction history
Notes in the margins
Highlights & Underlines
Dog-eared pages
Opens more easily to more used places

Properties

Proxemic
Transparent space in that signs and structures can be easily understood

Passive
Allowing passive collection of history without interfering users’ tasks

Rate/form of change
Summarizing what has happened

Degree of permeation
Separating interaction history from the object

Social
“we all benefit from the experience, preferably someone else’s”
Kind of information

<table>
<thead>
<tr>
<th>What</th>
<th>Why</th>
</tr>
</thead>
<tbody>
<tr>
<td>Searching for value</td>
<td>Doing similar things</td>
</tr>
<tr>
<td>Giving guidance</td>
<td>Discovering similar goals</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Who</th>
<th>How</th>
</tr>
</thead>
<tbody>
<tr>
<td>Doing things with friends</td>
<td>Showing how to do things</td>
</tr>
<tr>
<td>Doing things with people who are similar to me</td>
<td></td>
</tr>
<tr>
<td>Establishing authority and authenticity</td>
<td></td>
</tr>
</tbody>
</table>

“Footprints”

Allowing users to create history-rich objects
Providing History-rich navigation in complex information space
Contextualizing Web pages
Maps
Path view
Annotations
Signposts
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
Matching the framework
  Social?
  Passive?
  Proxemic?
  Unpermeated?

Path View

Lower level view
What paths have been followed by other people
  Relevant to current open document
  Merging path with common starting points
Matching the framework
  Social?
  Passive?
  Proxemic?
  Unpermeated?
Annotations

Showing what percentage of users have followed each link

Matching the framework
   Social?
   Passive?
   Proxemic?
   Unpermeated?

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

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
Direct/Active Social Navigation

Voluntary sharing of information with friends
Directly asking questions for getting information
Sharing bookmarks with others

Supporting Social Navigation on the WWW

Pointing out information in the web
Awareness of presence of other users
  Showing demand for a certain type of information at a certain time
Flash-crowds
  How the entire user population moves through the information environment
  Location attracting large crowds of users
Juggler

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

Features

Textual virtual environment
Pointing out pages
    While talking to people
    By saying them
Looking at people and object
    Associating URL with people, objects, and locations
Pointing out button
    Pointing out (sharing) the current page
Features

- Pointing out Pages to Objects
  - Asynchronous communication
- History-enriched environment
  - Showing access-counter for chat rooms

Examples

- Social navigation in information space
  - KnowledgeSea II
  - CourseAgent
  - CoFIND
KnowledgeSea 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

Map
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
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

Pro and Cons of the theoretical framework?
Evaluation framework?
Can digital footprints help us make less mistakes?
Would everyone want to see the footprints the same way? and would benefit the same way?
Snowball effect
  No distinction of good and bad paths
  Frustrated users will not provide comments about their negative experience
Knowing about the needs and preferences people to follow?
History decay
Popularity of map navigation?
“Footprints” should be used for designers of the web pages

Discussion

Value of social bookmarking?
“one of the purposes of social navigation is to provide order to the impossibly disorganized web”
Delicious seems to me like a community filtered google output