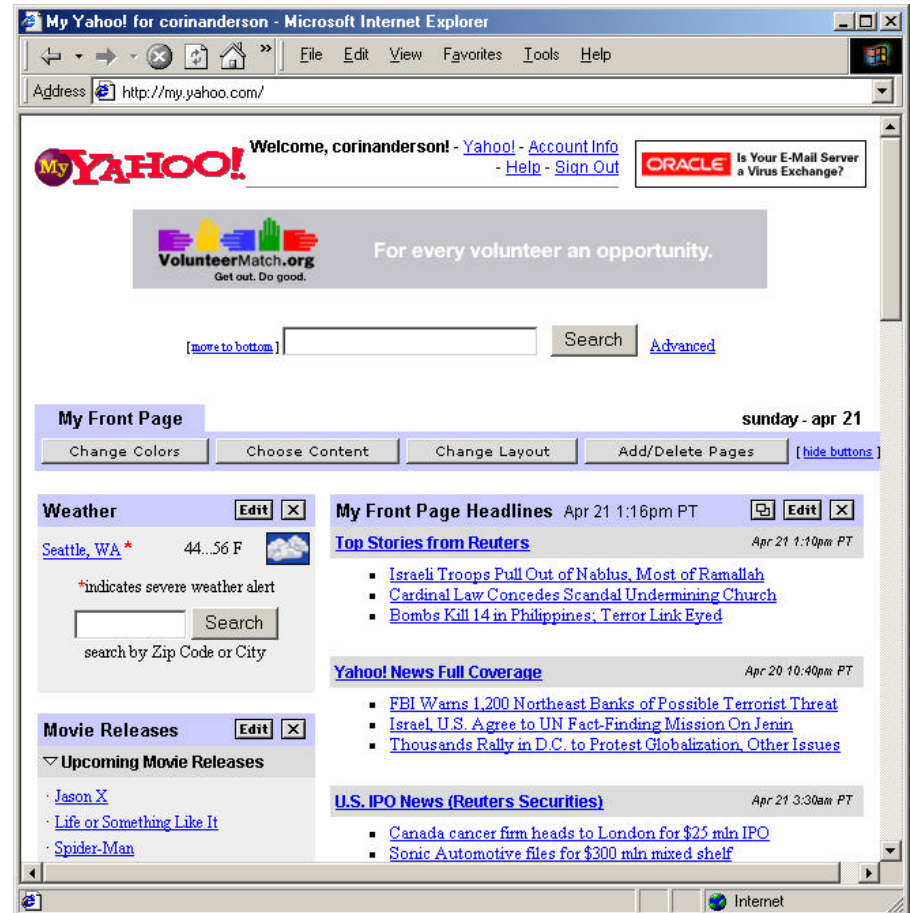


Web Montage: A Dynamic, Personalized Start Page

Corin Anderson – University of Washington
Eric Horvitz – Microsoft Research

Today's personalized portals

- Make routine tasks easier
- Users configure and maintain
- Content biased by sponsor site
- Display insensitive to browsing context



Our conjectures

1. Users want one-click access to routine destinations
2. Conditioning on browsing context will increase the value of personalization
3. Past web access patterns can predict future browsing destinations

The Web Montage system

- Builds dynamic, personalized portals
- Embeds and links to content from many sites
 - Builds montages of information
- Montages are dynamic, depend on user's browsing context

A web montage

- Groups by topic
- Embeds content from many sites in **content lenses**
- Links to other content
- Links to topic-specific montages

Corin's Main Montage - Microsoft Internet Explorer

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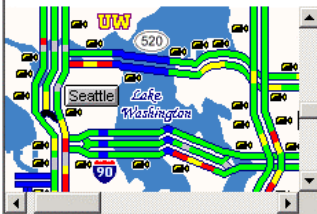
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Content lenses

The Seattle Times Home Page - Microsoft Internet Explorer

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THURSDAY November 1, 2001

seattletimes.com The Seattle Times

51°F

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IOW study says more children's hospital visits are for mind disorders than for accidents

Terrorism scare delays plane unloading at Sea-Tac

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Done Unknown Zone (Mixed)

Links-only montage

- Display only links
 - No content lenses
- Only one montage
 - No topic-specific pages
- Loads quickly
- Displays more links



The Montage system

- Two-step approach
 - Step 1: model the user
 - Step 2: assemble the montage
- Condition the personalized portal on the *context* of web browsing
 - Time/date of session
 - Topic of recent browsing

Step 1: model the user

- User directs browsing through a proxy
- Montage collects context of each request
 - Topics are drawn from Open Directory
 - Computers & Internet ; Sports & Recreation ; etc.
 - Topics are assigned using content classifier
- Learns 5 aspects about the user...

User model: candidate pages

1. Candidate pages to include on montage

- Can't consider all pages on web
- Can't consider all pages ever viewed
- Consider pages that have been **revisited**

User model: interest

2. User interest in page

- Would the user want to return to this page?
- We use:
 - Links followed from page
 - Time spent in sessions starting w/ page

3. User interest in topic

- Which topics to display in Main Montage?
- Sum of interest in pages belonging to topic

User model: navigation savings

4. Probability of revisiting page

$$\Pr(p) = \frac{\# \text{ sessions containing } p}{\# \text{ sessions total}}$$

5. Savings possible

- How many steps would a link on the montage save?

Step 2: assembling the montage

- Collect the context of the current session
- Estimate expected utility of pages & topics

$$E[U(p)] = \Pr(p | C) (I(p) \times S(p))$$

- Pack content and links into window
 - Fill exactly one browser window – no scrolling
 - Knapsack packing problem

A Montage user study

- Tested for two variables
 - Model: Complex vs. simple
 - Simple model: suggest most frequented links
 - View: Links-only vs. embedded-content
- Three study groups of 6 people each
- Each group saw complex/embedded and
 - Simple / links-only
 - Complex / links-only
 - Simple / embedded-content

Study procedure

- Users directed all browsing through proxy
- Users set montage as their start page
 - Users rate opinion of montage each visit
- First 7 days: collect data exclusively
- Next 4 days: we present first view
- Next 4 days: we present second view
 - Models rebuilt nightly; montages hourly

Scores for Montage styles

Model	Score
Simple	2.64
Complex	3.79

View	Score
Links-only	4.40
Embedded-content	2.98

1 = Not pleased

7 = Very pleased

- Complex model best
 - Context-sensitive & expected utility
- Links-only is preferred view

Lessons learned (1 of 3)

- *Users want one-click info access*
 - Users appreciated automatic display of links
 - But links-only (two clicks) preferred over embedded-content (one click)
- Montage load time important
 - Portal/home page must load quickly
- Variety in displayed content better
 - More links displayed on links-only montage

Lessons learned (2 of 3)

- *Context enhances personalization*
 - Complex model preferred over simple
- What context is best?
 - Time/date & topic of recent browsing
 - Other applications running on computer
 - User demographics

Lessons learned (3 of 3)

- *Past accesses predict future browsing*
 - Montage often displayed appropriate content
- Longer-lived history would help
 - Many revisited pages too infrequent in study
- Collaborative filtering would, too
 - Montage could display content other, similar users have viewed recently

Related work

- Personalized portals
 - MyOwnWeb [Anupam, et. al., 1999]
 - Web Object-Oriented Desktop [Chan, 2001]
- Automated bookmark systems
 - PowerBookmarks [Li, et. al., 1999]
 - Bookmark Organizer [Maarek & Ben-Shaul, 1996]

Summary

- Montage improves routine web browsing
- Montage follows two-step approach
 - Learns context-based user model
 - Builds dynamic, personalized web portals
- Study results show Montage strengths & suggest future research

Future work

- More user control over utility evaluation
 - User sets trade-offs in utility model
- Dynamic topic leveling
 - More detail only in topics of interest
- Mixed-initiative montage
 - User can directly add & delete candidates
 - Montage automatically selects best candidates and formats page