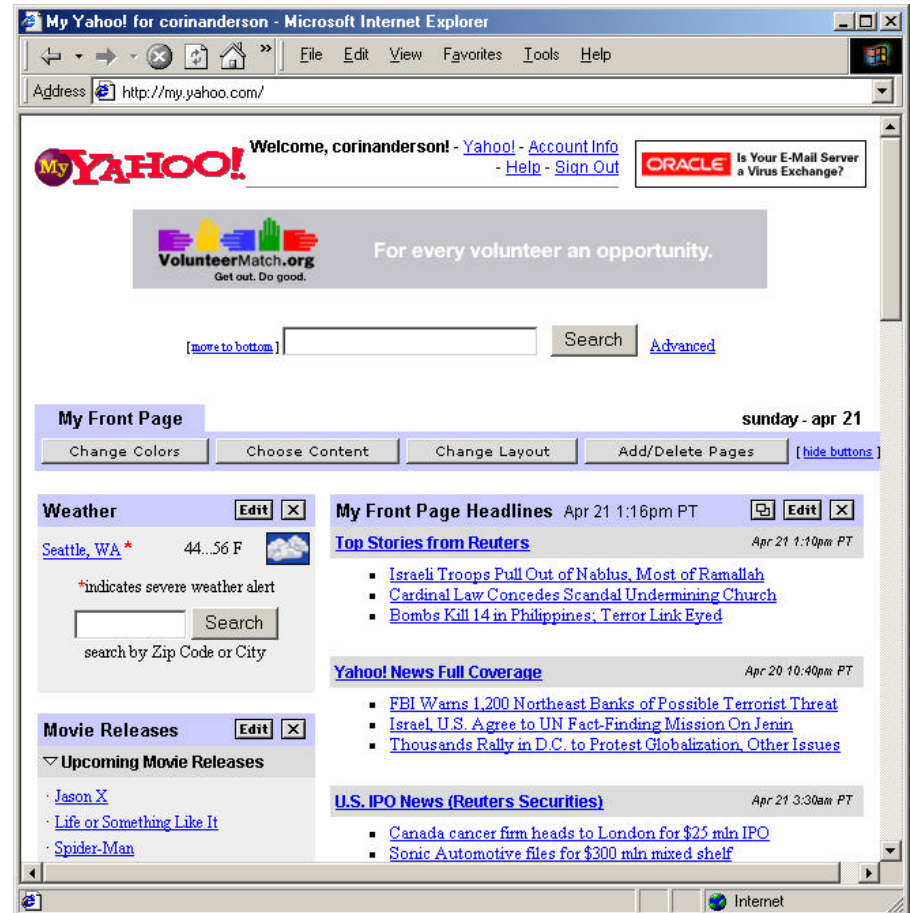


Web Montage: A Dynamic, Personalized Start Page

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

Main Montage [Refresh montage](#) *Your other Montages:* [MyMontage - Business & Finance - Computers & Internet - Entertainment & Media - Home & Family - Society, Politics, & News - Sports & Recreation - Uncategorized](#)


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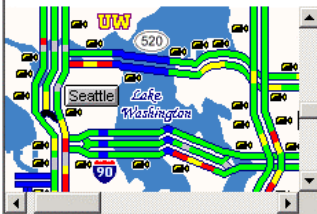
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Content lenses

The Seattle Times Home Page - Microsoft Internet Explorer

A Service of The Seattle Times Company seattletimes.com NWclassifieds NWsource

THURSDAY November 1, 2001

seattletimes.com The Seattle Times

51°F

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Terrorism scare delays plane unloading at Sea-Tac

Crash scene clash brings police suit

Official inviting public's opinions on 'credit scoring' by insurers

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Taliban claim more civilian deaths
Britain, U.S. begin global PR effort
Northern Alliance's lives are tough to camouflage

THE RESPONSE

House readies competing plans for airport security

ANTHRAX

N.Y. woman fourth to die of spore anthrax
An ordinary life ends swiftly in anthrax mystery

BUSINESS

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High School sports
Coverage of all the fall sports, plus a new database full of schedules, standings, rosters and statistics for football.

Election 2001
Seattle mayor, initiatives, local races.

Suburban news
Find news about the Eastside and Southside.

150 YEARS
SEATTLE 18 AND BY
Seattle's history: A hell with a history. See the Webcast 150 of 170 most influential people.

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Internet

Done

Unknown Zone (Mixed)

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[Joe The Circle Volume 12, let...](#)

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