

# Designing an Integrated Bookmark / History System for Web Browsing

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## Extended Abstract

Current commercial web browsers such as Netscape Navigator and Microsoft Internet Explorer attempt to make it easier for users to return to previously visited web pages. They offer several important facilities for doing this, with the major ones being the `Back` button, the history list, and bookmarks.

In theory, these mechanisms should be heavily used, for almost 60% of all pages a person visits are to ones that they had seen previously [Tauscher and Greenberg 1997]. Yet research indicates several problems with these mechanisms. While `Back` is heavily used, people have an incorrect model of how it works, which leads to surprises when just-visited pages are no longer reachable [Cockburn and Jones 96; Greenberg and Cockburn 99]. Also, the bookmark and history systems are not used very frequently [Tauscher and Greenberg 97; Abrahms, Baeker, Chignell 98].

We believe that one of the reasons for these problems is that browsers provide revisitation systems in a fragmented, un-integrated manner. `Back`, history and bookmarks all use dissimilar underlying models, different interfaces, and various ways of sorting and presenting groups of candidate pages. In this research, our goal is to integrate the idea of `Back`, history and bookmarks into a single integrated revisitation system that captures the best features while remedying their known deficiencies.

We are currently developing our prototype system (see Figure) that works within Microsoft Internet Explorer; some of our ideas were first explored earlier versions [Greenberg and Cockburn 99; Cockburn, Greenberg, McKenzie, Smith, and Kaasten 99]. The unifying principle of this prototype is that all visited pages are organized as a recency-ordered history list, with duplicate pages shown only in their latest position.

In keeping with this organization, we altered `Back` and `Forward` buttons so that they work on a recency-based model instead of a stack: the buttons are thus just shortcuts for moving up and down the history list [Greenberg and Cockburn 99]. By bolding the currently visited item on the list, a user sees immediate navigational feedback on their `Back` and `Forward` actions.

We then transformed bookmarks into two different features. First, *implicit bookmarks* are pages that are visited frequently: these pages are automatically visually distinguished from pages visited rarely. The figure shows how we mark these pages with a vertical red band, where the height of the band indicates the degree of the page's visit frequency. Second, *explicit bookmarks* are just pages on the history list that are tagged as special: we call these *dogears*. A user can quickly set a dogear by right-clicking over a page on the history list and selecting 'dogear' from a popup menu; users then have the opportunity to change the page's title if they wish. Dogeared pages look different from non-dogeared pages. For example, in the figure we see that the 'Grouplab' and the second 'University of Calgary' page are dogears, as illustrated by the folded down corners in the upper right corners of the images.

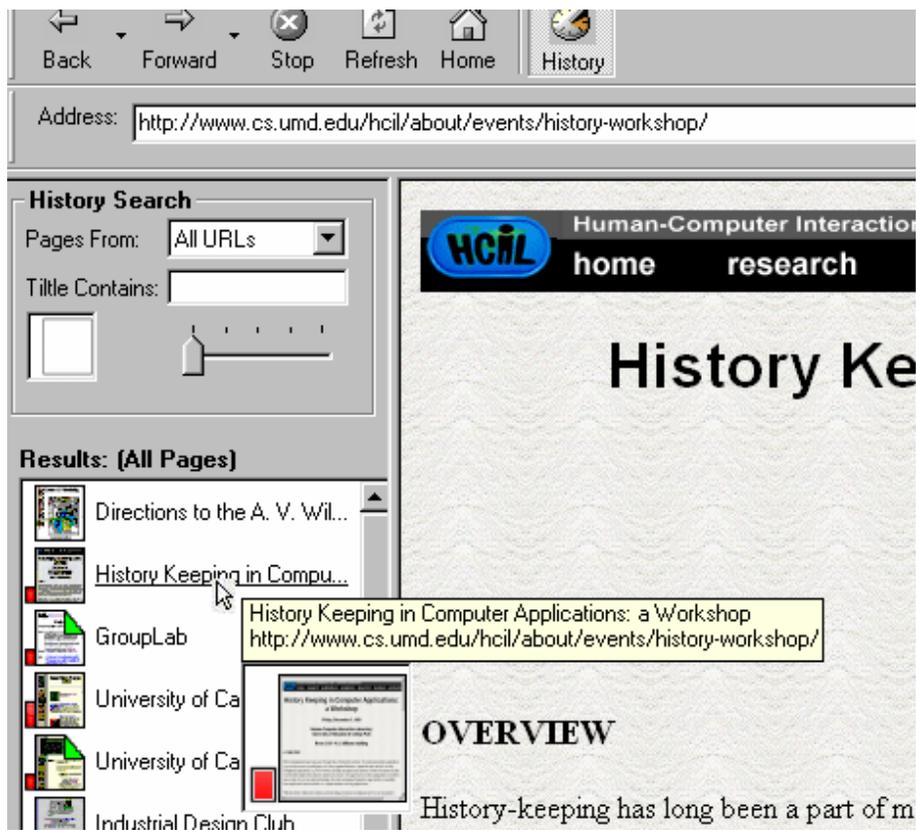
Kaasten, S. and Greenberg, S. (1999)

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To make this all work smoothly, users can rapidly filter the history list simply by moving a slider (illustrated near the top of the figure). As the slider is moved to the right, pages with low visit frequencies are immediately filtered from the list. When positioned at the extreme right, only dogeared pages are displayed.

We also have added a *search filter*, where the history list is filtered to display only those pages whose title contains the specified substring. Finally, we try to make scanning the list for a particular page easier by representing pages not only by title and URL, but by a thumbnail image as well [Cockburn, Greenberg 99].

What is important is that all these techniques work together on a uniform model: all items are displayed within a recency-ordered list, and all manipulations just change the visual appearance of an item or filter the list without any change to its order.



## References

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