PearlView: Non-Disruptive Hyper-List Browsing

We present PearlView, a graphical UI component helping users to navigate through hyperlists — such as the search results of a search engine— and preview the destination pages without the disruption of context normally created by going back and forth between pages. PearlView, unlike thumbnails, provides a comprehensive set of functionality for each page preview.

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INTRODUCTION

Many times when a user looks for information, whether it is in a list of search results, a discussion group, etc, he or she is presented with an overwhelming list of items to browse through. When browsing through the list, it is common that the user needs to navigate to each item to be able to judge the quality or relevance of the information. The further down in the list the user moves, the more items does he/she have to click on, verify and go back to the list. Constantly switching contexts creates a cognitive load for the user, which under suboptimal network connections it is amplified by long delays.

We present the PearlView, a non-invasive extension to a hyperlist that lives within a single page without resorting to permanent panes or frames, nor images thumbnails [1]. PearlView allows the user to preview the items or pages pointed to in the list without making the user leave the page with the list and without permanently dividing that page in different frames or panes (see Figure 1) or taking more space per row in order to accommodate a thumbnail. We believe this supports a better allocation of real estate and user attention.

PEARLVIEW DECONSTRUCTED

At a first glance, the hyperlist looks not much different from a hyperlist without PearlView. However, looking more carefully one can see PearlView on the right. Each item in the hyperlist is represented by a pearl, and the pearls connected by a string. The discreteness of PearlView is by design as we want to convey the feeling of enriching the search experience without detracting from how you normally do it today. Also, the location of PearlView could be on the left too but in our examples we wanted to experiment first on the right as many websites where PearlView could be applied may already have a traditional left side navigation.

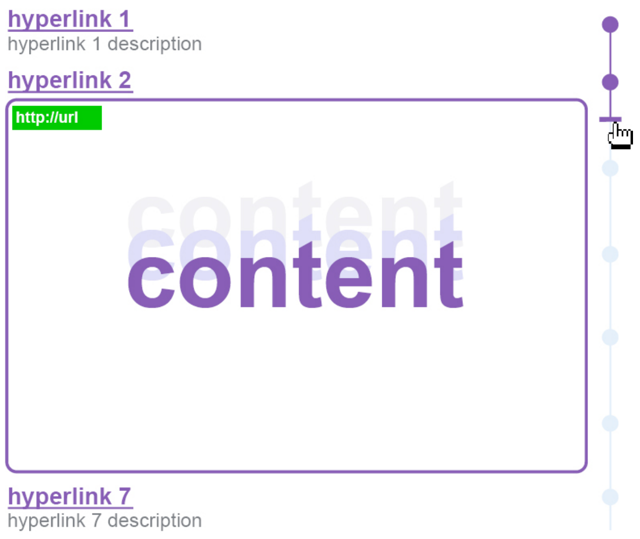

Figure 1: PearlView Design Elements

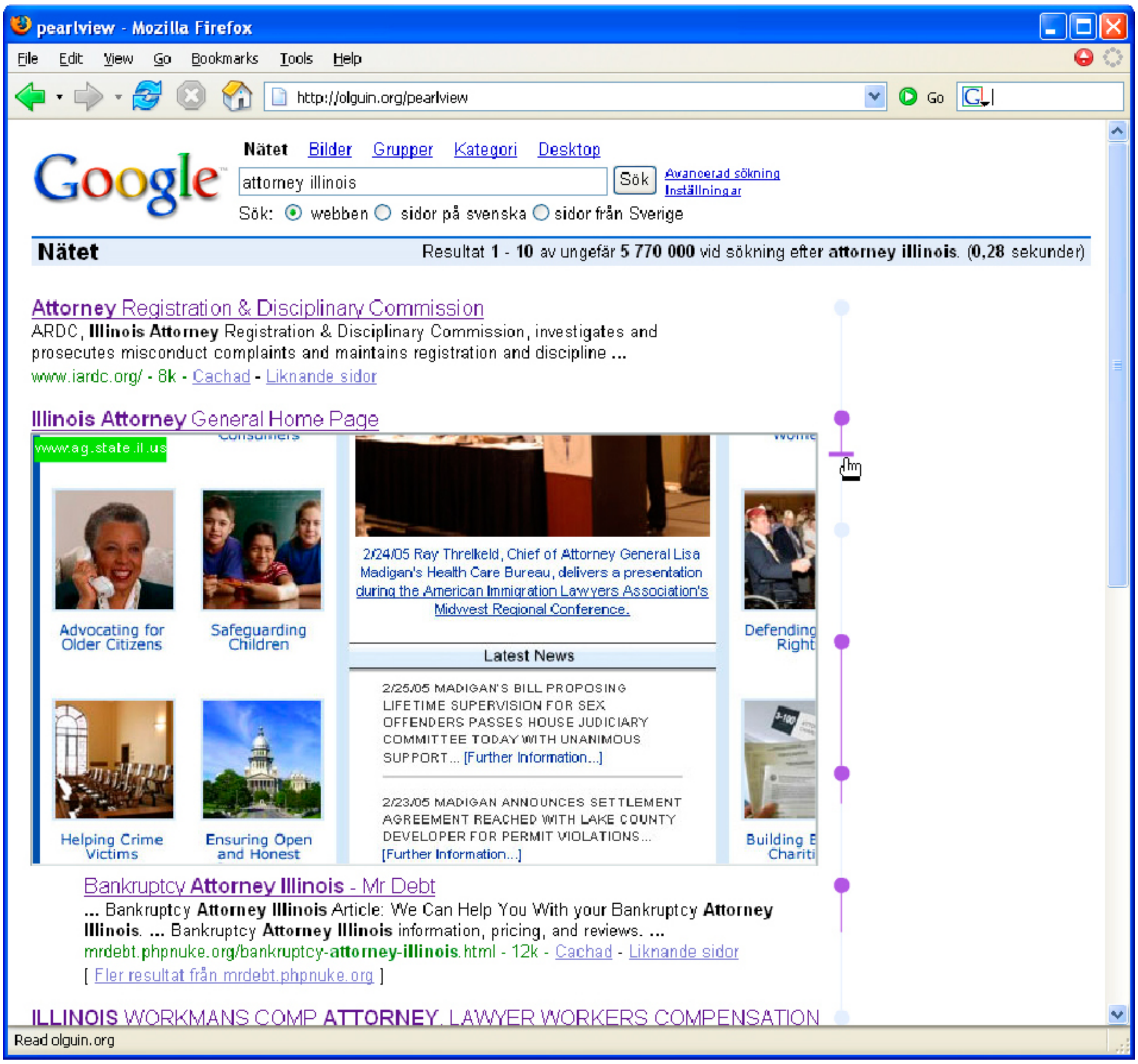
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Figure 2: Search Results with PearlView

PearlViewing

As the user starts PearlViewing by clicking on a pearl, the destination page for the corresponding item in the hyperlist is displayed. The user can preview pages without leaving the hyperlist page, and even directly access hyperlinks on the previewed page. In addition, the user can scroll through the previewed page by moving a handle up and down the string hanging from the corresponding pearl.

The PearlView window floats on top of the page to optimize use of the real estate. The floating window is larger than most commonly used floating windows (e.g. mouse over effects such as alt text display); however, the string of pearls is never covered by the floating window and acts as the contextual bridge that is always visible to the user.

The visited pearls turn into the color the browser assigns to visited links. So do the parts of the strings the user moved the handle over when scrolling. PearlView is deactivated when the users moves the cursor outside the string of pearls or the preview window. The pearls and strings stay as colored traces of PearlViewed pages.

Manipulating Timing and Exposure of Bandwidth Usage to Improve User Experience

PearlView tries to mitigate the penalty on the user experience for having to download potentially lots of images and text. This can be especially important under slow connections. First, the additional time it takes to download a PearlView-enabled page with respect to one without PearlView is virtually identical. This is because the only new element downloaded is PearlView (not all the preview pages) and since it is page independent, it can be cached for later sessions. Once the page is downloaded, PearlView begins downloading in the background the destination pages of the hyperlist, starting from the top. When PearlViewing, by the time the user reaches to the last pearls, it is more likely that these will be immediately available, even though they were not in the beginning.

MULTIMODALITY OF PEARLVIEW

PearlView is designed to allow multiple modes of operation: 1) mouse movement, 2) keyboard strokes, and 3) mousewheel. Each of them behaves slightly different enabling users to take advantage of the properties of each mode, giving more texture to the user experience.

For example, to scroll the preview page, the user has the option to drag the handle down the string of pearls using the mouse, scroll the mousewheel, or use the up and down keys. When using the mouse, as the length of the pearlviewed page varies, the scrolling speed changes since the length of the pearl string remains more or less constant reflecting the space between rows. On the other hand, the mousewheel and the up/down keys afford a more granular scrolling since it is independent of the length of the pearl string.

Also, when using the mouse to move down the pearl handle, to avoid accidental deactivation of PearlView by mousing out, we widened the actual hovering area beyond each pearl and string.

CASE STUDY: PEARLVIEW IN A SEARCH ENGINE

We decided to test PearlView within the search results of a well-known search engine [5]. For this, we created a working prototype reflecting the main attributes of the design (see Figure 2). After asking the participants to perform two basic tasks, previewing a page and scrolling down to the bottom of the page, we presented them with a scenario where they needed to select an attorney in Illinois. The prototype page we presented was the search results of entering "Illinois" and "attorney" as search keywords with PearlView.

The results are encouraging. All the participants were able to perform basic interactions with PearlView immediately, and six out of seven participants did use PearlView to help them solve the task of finding an attorney. It was interesting to note that none of the users noticed PearlView until it was pointed out to them, which suggests that the design is indeed unobtrusive, and depending on how it would be introduced, might be too subtle.

We received feedback from users such as "it saves me a lot of time because when I have 50 hits to go through I can do it quickly". Although further testing is needed, we believe it would be very rare for the user to go through 50 hits without using PearlView and now he would be more likely to do so. Hence, PearlView could increase the chances of users finding better search results in large sets returned from the search engine.

OTHER WORK

While designing PearlView we looked at other approaches taken to improve the user experience of hyperlist browsing, focusing mostly on search engines. We found the greatest number of innovations in the industry itself, which can be understood in the context of both the current browser war, renewed with the popularization of Firefox; the search engine war, and everybody else trying to develop tools or enhancements for these popular applications.

We could classify the innovations in three groups, 1) new web designs and layout based purely on the current browser capabilities to render rich media (A9 [2], Teoma [3] to mention a couple), 2) plugins that enhance the browser's capabilities (Google Preview [1]), and 3) new browsers with new capabilities (Firefox [6] and Safari's [7] tabbing).

In this way, A9 is a relatively new search engine that combines everything that can be searched including images into one single view giving the users a interesting mosaique. In A9, isolated images can be previewed, but not web pages, partly alleviating the cognitive disruptions caused by going back and forth between web pages.

Another example is the Google Preview [1] plug-in from category 2, or the web version of it –category 3– from the same developer [8]. Here, a small preview of each page begins showing one by one after the skeleton of the page is downloaded. Although the thumbnail provides a glimpse of the page and this in itself provides useful information, the user can rarely read the text in the thumbnail and cannot click on the links. Since thumbnails need to have a reasonable size to be valuable and are permanently embedded in the list, they need to occupy more real estate for each row of results.

There are however legal implications [9] with the use of these tools and the copyright infringements they may incur. This is an ongoing debate that we hope will eventually be resolved for the benefit of users finding knowledge on the web. In general, we believe that all these tools, including PearlView, are at the core complementary to each other and promote the construction of a better web.

FUTURE WORK

We would like to further test PearlView in itself and also compare the differences between PearlView and other approaches described above to get a deeper understanding of how the search context affects the users' needs.

Eventually we would like to consider enriching PearlView with more options, for instance, indicating the location of the first occurrence of a search keyword in the hanging string.

CONCLUSIONS

The string of pearls is at the heart of what PearlView brings to the field, together with the harmonization of its different elements such as the floating window moving smoothly around the user movements.

The greater sense of trust –or distrust– of the pages that PearlView points to inevitably emerges as an important factor on what we heard from test users. We suggest that the fake example we used in our demo, although very specific (look for a lawyer in Illinois) is prototypical to some degree of the concerns of users when searching. Because of this anything we can do to increase trust without sacrificing other things such as cognitive disruptions is good.

In addition, we are curious about the implication that the widespread use of all these type of tools could have. For instance, would designers of web pages, even the more informal ones, be more careful in their aesthetic decisions if they knew that now users will access their site more effortlessly and therefore leave equally effortlessly? Of course, all this presumes that tools such as PearlView become 1) fully legal to use and 2) so pervasive that they make a difference in the minds of the web designers. However, we find ourselves optimistic about the future of the web, that visualization/navigations tools such as PearlView together with backend technologies that add more meaning to what is shown or searched or discussed such as [4], will bring us closer to the yet ethereal semantic web. We are eager to see and to help the web leaving its diapers.

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