Visual Web Exploration: Beyond Ranked Snippets and Thumbnails

Marian Dörk   Sheelagh Carpendale   Carey Williamson

Department of Computer Science, University of Calgary
2500 University Drive NW, Calgary, AB, Canada T2N 1N4

1 NAVIGATING THE GROWING WEB

Throughout the Web's 20 years of existence, we have witnessed a sustained increase of Web-based content. Thousands of blog posts, status updates, photos, podcasts, video clips, and other types of resources continually appear on the Web making it increasingly hard to have a sense of what is actually out there. In parallel with the explosive growth of information on the Web, we have seen a trend towards more sophisticated ways of navigating the Web utilizing growing computational capacities. At the beginning of the Web, one followed hyperlinks from one Web page to the next to find interesting but not always relevant information. A few years later, with the arrival of search engines, we gained access to far greater content with better control by entering search terms and browsing lists of mostly relevant results.

2 VISUAL SEARCH INTERFACES

As the Web continues to grow immensely, we think a logical next step is developing more visual and interactive ways for exploring the Web. However, most visual search interfaces that are currently appearing do not make use of information visualization as a way to aggregate or summarize information. Instead we see playful graphical interfaces or previews of visual Web resources that employ ranking algorithms to reduce the number of displayed items. For example, Google's News Timeline [3] provides a news table with magazine covers and textual news snippets arranged in a visual collage (Fig. 1). SearchMe [5] places large-sized screenshots of search results on panes in a three-dimensional interface allowing the searcher to flip through resulting Web pages. The search engine Bing [1] allows its searchers to play videos within the result page.
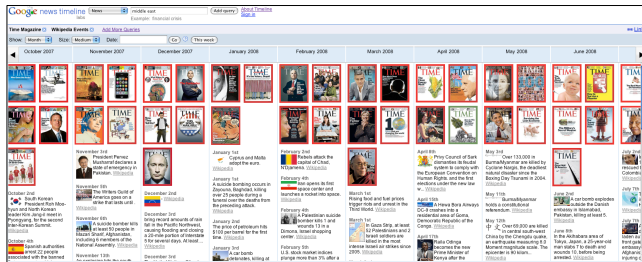

Figure 1: Google News Timeline: A visual information collage.

Visual displays of snippets, thumbnails, or video previews give searchers rapid access to some relevant Web resources. However, what is shown is typically only the tip of the iceberg determined by PageRank-like [4] algorithms with often unknown criteria and heuristics squeezed into a linear sequence. Sets of isolated items arranged as tables or three-dimensional panes provide little or no contextual information. To grasp the extent and nature of an information space one would have to go through many resources reading snippets, flipping page previews, or watching video clips.

3 FROM RANKING TO AGGREGATION

Most visual search interfaces rely on the established ranking paradigm geared towards satisfying text-based queries. Yet, we think that the ranking paradigm has constrained our thinking about what Web search should be. Instead of aiming for a subset of an information space, visual aggregation aims to provide an overview or summary thereof. One way to provide visual summaries is to visualize a collection's meaningful facets, such as time, location, and keywords for news-related blog posts. VisGets [2] (Fig. 2) provide a start in this direction by displaying visually summarized evidence of available content. This idea could be extrapolated to the display of results. There seem to be potential advantages to this approach when wading through results, in that the searcher does not have to look at large numbers of individual Web resources to get a sense of what is available. Furthermore, interactive visualizations provide new ways for query formulation beyond text-based search queries.
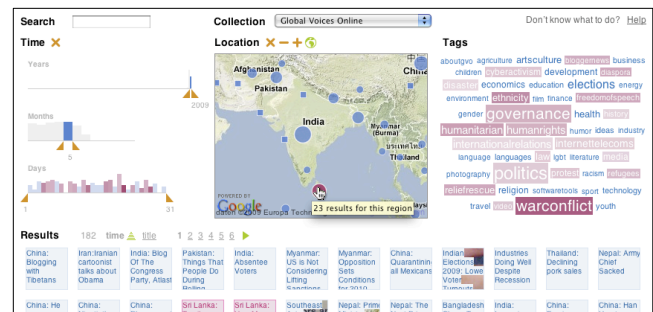

Figure 2: VisGets: blog posts from Global Voices Online visually aggregated and filtered along time, location, and tags.

We believe information visualization can play a great part in providing novel, useful ways for exploring the Web. However, while there is a progression toward more advanced navigation methods, earlier techniques will not likely be replaced soon. Like search has not taken over browsing, we anticipate that visual aggregation will complement and build on ranking. In fact, it would be interesting to study in more detail these navigation and search strategies and explore their strengths and weaknesses with regard to the type of information needs. Other research challenges include architecting robust and scalable infrastructures for visual aggregation, designing flexible and unobtrusive interfaces, and developing visualizations that take into account the diversity of the Web.

REFERENCES

[1] Bing. http://www.bing.com/videos (Retrieved 2009-07-15), 2009.

[2] M. Dörk, S. Carpendale, C. Collins, and C. Williamson. VisGets: Coordinated visualizations for web-based information exploration and discovery. *IEEE Transactions on Visualization and Computer Graphics*, 14(6):1205–1212, 2008.

[3] Google. News timeline. http://newstimeline.googlelabs.com/ (Retrieved 2009-07-15), 2009.

[4] L. Page, S. Brin, R. Motwani, and T. Winograd. The PageRank citation ranking: Bringing order to the web. Technical report, Stanford Digital Library Technologies Project, 1998.

[5] SearchMe. http://www.searchme.com/ (Retrieved 2009-07-15), 2008.