A Visualisation Technique to Communicate Implicit Feedback Decisions

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ABSTRACT

This poster describes a visualisation technique for communicating the effects of implicit feedback decisions using a familiar interface component, the scrollbar. The results of a pilot evaluation show the technique is unobtrusive and encourages focused interaction.

KEYWORDS: Top-ranking sentences, implicit feedback, scrollbar.

INTRODUCTION

Implicit feedback systems gather relevance information unobtrusively from searcher interaction and use the information they gather to change the query or retrieval strategy. These systems remove searcher burden, but also searcher control, and as such, should communicate decisions in a way that does not impede information seeking.

In earlier work (White et al, 2002) we presented a list query-relevant *top-ranking sentences* as a means of facilitating access with highly-ranked retrieved documents. The approach reordered the list of sentences using relevance information gathered from searcher interaction. The interface used was successful however searchers found the reordering distracting. This poster describes a technique for presenting the *effects* of dynamically reordering such lists of potentially relevant information objects.

The approach we propose does not directly reorder the list itself, but a representation of the list, imposed on the scrollbar. The approach treats each sentence as a *tile* on the bar, assigns each tile a shade to represent its relevance and recolours the tiles to communicate the reordering. These *ScrollTiles* use scrollbars in a similar way to (Hill et al, 1992) which does not consider degrees of relevance or dynamically update the scrollbar to communicate feedback decisions. The work of (Harper et al, 2003) is also related but does not use scrollbars to communicate relevance information.

SCROLLTILES

Figure 1a shows the top-ranking sentences with the ScrollTiles and Figure 1b the effects of a series of feedback iterations on the ScrollTiles. The scrollbar is a familiar interface component and since the length of the bar represents the length of the list it is easy for searchers to navigate through the available information.

As the searcher views relevant information, terms are chosen from the information they view, weighted based on their estimated utility and the most useful terms used to reorder the list of sentences. This action *does not directly affect the order of the list*, but the shading of tiles on the scrollbar. Each sentence is assigned a degree of relevance (in relation to the most relevant sentence) communicated through the depth of shading of that tile (Hearst, 1995). That is, the highest scoring sentence will have the darkest shade and the lowest the lightest. As is shown in Figure 1b, the relevance score of top-ranking sentences originally placed at the bottom of the list (i.e. originally regarded as having low relevance) can change in light of relevance information. Using the scrollbar to communicate implicit feedback decisions means we can utilise searchers' experience with windowing environments and encourage focused interaction with the most potentially useful information objects.
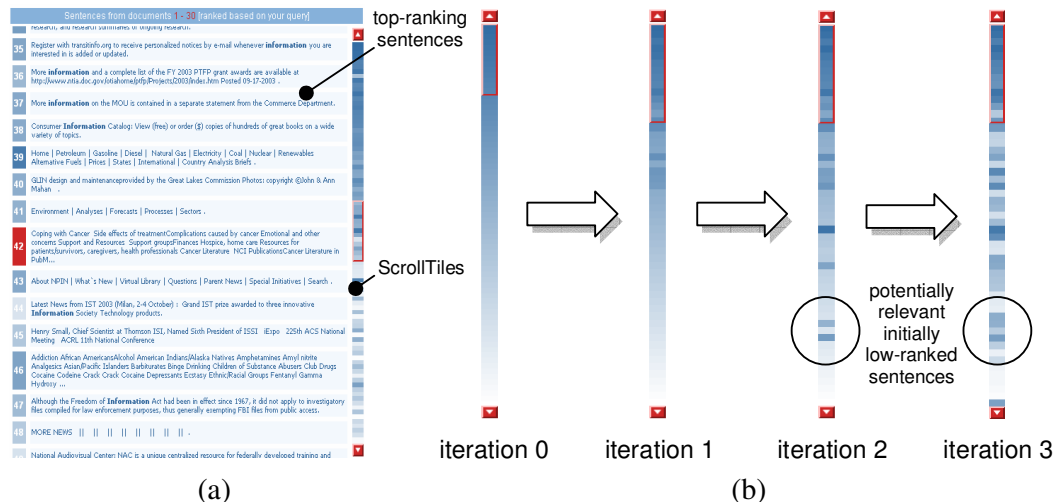
Figure 1. a. The ScrollTiles and top-ranking sentences b. Changes in ScrollTile over 3 feedback iterations

EVALUATION

We carried out at preliminary evaluation of the ScrollTile approach, in which we compared a system using it (S_1) with a system that reordered the top-ranking sentences (taken from (White et al, 2002)) (S_2). We recruited 9 searchers with varying levels of search experience. The searchers used a training task on a static version of the system (i.e. with no reordering) to familiarise themselves with the interface. Searchers then attempted two simulated work tasks of different types (*decision* search and *background* search), one on each system (upper limit of 10 minutes per task). The systems were assigned so that some searchers began with S_1 and others S_2. The tasks only facilitated interaction with the systems tested, and no measurements of task success were taken. All searcher interaction was automatically logged and searcher opinion gathered.

DISCUSSION

The results demonstrated that by using such techniques we can get searchers to exhibit more focused interaction with retrieved information. The amount of exploratory scrolling (i.e. scrolling only to see what was in the list) was reduced, replaced by clicks that targeted the darker, more relevant parts and led to more efficient searching. Participants also found the dynamic updating through the ScrollTiles less distracting than reordering the list. The implicit component of the system worked in concert with the searcher, and did not hinder their search. The use of the scrollbar *to communicate feedback decisions* in this way has uses other than that demonstrated here. It is conceivable that the approach could be used, say, in interactive query expansion to convey changes in large lists of potential expansion terms, or to communicate changes in system perceptions about which *parts of document* are currently most relevant.

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