Conversation Thumbnails for Large-Scale Discussions

Martin M. Wattenberg
IBM Research
One Rogers Street
Cambridge, MA 02142
+1 617.693.5650
mwatten@us.ibm.com

David R. Millen
IBM Research
One Rogers Street
Cambridge, MA 02142
+1 617.693.7490
David_R_Millen@us.ibm.com

ABSTRACT
We present a new interface for large-scale online conversations. Our technique, the Conversation Thumbnail, differs from existing discussion interfaces in two respects. First, it employs a focus+context visualization technique that exploits message-level metadata to provide an easily navigable overview of a discussion. Second, it helps reduce conversational redundancy and improve coherence via a fast automatic search mechanism that highlights related messages during message composition. The Conversation Thumbnail Viewer is currently implemented as a Java applet that can be applied to a variety of discussion data sources.

Keywords
Social Navigation and Visualization, User Interface, Persistent Conversations, Collaboration

INTRODUCTION

Large discussions are a key part of the internet. Usenet newsgroups, web sites like Slashdot.com, and intranet-based bulletin boards all present conversations that are so huge—often containing hundreds of messages adding up to the size of a full novel—that they are simply too vast to absorb in their entirety. Readers of such large conversations face two critical challenges. Can they identify and navigate to interesting messages? And when composing a message, how can they ensure they are not fragmenting the conversation by duplicating a previous message or ignoring a relevant thread they have not yet read?

Many researchers have tackled these problems by providing a visual overview of the conversation. Timeline representations of member activity have been used in the Babble interface [2]. Conversation Maps [8] display social and discourse structure, as well as highlighting key topic words. Loom [1] displays thread structure and emotional content. Smith and Fiore [9] explore interpersonal connections and thread structure.

All of these visualizations, however, are demanding for the user. In each case it is difficult to skim rapidly through many messages since individual messages can only be viewed via an additional explicit user action, such as a button click. Moreover they rely heavily on thread structure, which in a very large conversation may not be sufficient to pick out interesting messages. Finally, they do nothing at the time of message composition to encourage or support conversational coherence.

THE CONVERSATION THUMBNAIL VIEWER

In this paper we introduce *Conversation Thumbnails*, a prototype discussion interface that provides skimming-friendly navigation, exploits available metadata to help spotlight important sections of the discussion, and uses a special composition-time search mechanism to help maintain conversational coherence. Figure 1 shows a portion of the interface for an illustrative discussion. The interface has three parts: a navigable overview of the entire conversation, a detail window displaying individual messages, and a composition area for new messages.

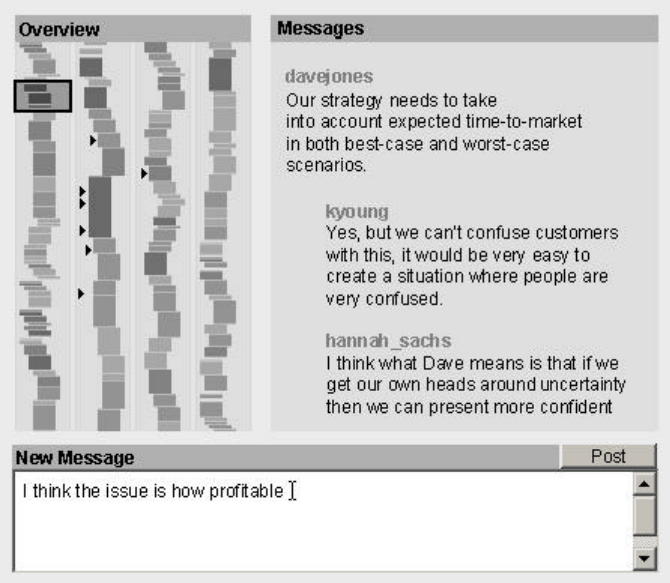

Figure 1. Conversation Thumbnail.

Conversation Overview and Detail

At upper left in Figure 1 is the Thumbnail Overview, a scaled-down view of the conversation. Each rectangle represents a message, with indentation indicating thread structure. Rectangle color, in this instance, indicates the perceived value of the message as voted on by conversation participants but can reflect a variety of other available metadata. We have found that some kind of data beyond thread structure is an important cue to relevant messages, and helps the user visually parse the overview. The user navigates by dragging a rectangular selector (top left); as the user drags, the detail window at right displays a full-size view of the messages. The overview is capable of displaying several hundred messages at once.

Related focus+context views [5] have been used in the SeeSoft project [2], as well as artistic representations of text [6]. The thumbnail technique has several important benefits. First, it is intuitive for novice users. Second, it provides an immediate view of the size and structure of the conversation as a whole. Third, it allows easy and rapid navigation. Compared to the standard method of navigating a hypertext discussion—clicking message by message—scrolling is rapid. As important than speed, however, is that fact that scrolling can be done without the user taking her eyes off of the messages, make it easy to skim material.

Composition Area and Automatic Searching

As the user types a new message, the software automatically searches the entire conversation for all occurrences of the word being currently typed. All occurrences are highlighted with small arrows in the thumbnail overview (Figure 1). For terms whose frequency is greater than a set threshold, no highlighting takes place, thus avoiding spurious visual activity for common, less significant words. Thus as the user types, he will occasionally see a cluster of arrows appear in his peripheral vision, alerting him to a potentially related sequence of messages.

This "just-in-time" searching (compare [7]) allows users to spot sections of the conversation that may address similar topics. Note that the integration of search results with the visual overview has proved critical in early tests, since it makes clusters of related posts evident. Alerting the user to potentially related messages provides conversational context, reduces redundant postings, and encourages better informed new contributions.

IMPLEMENTATION

The Conversation Thumbnail interface is implemented as a Java applet, written with JDK 1.1 and compatible with standard web browsers. On startup the applet loads an entire conversation into RAM so computation can be done on the client computer; this enables the rapid response times required by compose-time automatic searches. The initial download is not burdensome since a typical book-length conversation (on the order of 200K in ZIP format) can be accessed in under a minute on a dial-up modem.

CONCLUSION AND NEXT STEPS

The conversation thumbnail interface has been evaluated through informal usage, for navigating and exploring a large-scale discussion forum hosted on a corporate intranet as well as discussions taken from the web site Slashdot.com. Initial results indicate that users easily grasp the thumbnail metaphor and can navigate more rapidly than with a standard web interface. The tight integration of the thumbnail visualization with automatic search results has drawn special interest from testers. We will complete formal user assessment in a large-scale intranet forum later this year.

There are several natural extensions to the interface. Extracting and displaying additional metadata in the overview might improve navigability. It would also be natural to exploit syntactic tagging to enhance automatic searches. Further research is also needed to allow the visualization to scale to discussions with more than 1,000 messages, and to find effective ways to visually alert users to new contributions to the conversation.

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