Coterie: Live, Dynamic Visualization of Social Interaction Online

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ABSTRACT

Coterie, a visualization of online social interaction in IRC channels, provides a rich and highly informative display of social patterns. A viewer is presented with an explicit portrayal of the social patterns and interaction within a chat room through a live, dynamic, and aesthetic display of the activity within a channel mediated by historical interaction information.

KEYWORDS: Social visualization, social interaction online, chatroom, conversation, IRC

INTRODUCTION

Online chat has become a very popular setting for social interaction on the Internet. Traditional textual chat systems, such as Internet Relay Chat (IRC), provide users with a scrolling text window that shows participants' posts in chronological order and a list of the people currently logged onto the system [1]. Newer, graphical chat systems, such as Chat Circles, additionally provide users with a visual representation of everyone in the virtual room [2]. Such systems, however, display live activity with no integrated historical context, making it difficult to note recent trends in participants' activity or gain a quick sense of what a particular IRC channel's conversational patterns are.

Coterie addresses some of the limitations of these previous chat systems by providing a live visualization of a chat room that takes into account the previous interactions of the people within that room and the dynamics of individuals (how a user participates and how that interaction changes over time) and the group as a whole. Using color, size, and motion, Coterie builds a dynamic representation of the structure and activity within a chat room, based loosely on crowd configuration in real life [3].

COTERIE

Coterie presents an IRC channel in a window with the group's name drawn in the background, and members of that group laid out along the bottom of the window. Each person within the channel is represented by a colored oval. Each oval is placed horizontally on screen according to both group and individual participation statistics. The brightness, opacity, and size of an oval are also based on individual interaction information, and change over time. The basic layout can be seen in Figure 1. A person who is active will move to an area within the center of the group (the center of the window), while one who is inactive—a lurker, defined as someone who hasn't participated within the last five minutes—will inhabit a space at either the left or the right edge of the group. This automatic placement of people provides a visual center for the activity in the group, allowing active participants in the group to maintain a presence in the space. It also provides context for the channel as a whole, letting viewers see the structure of the channel at a glance (how many active people, how many lurkers, etc.) and note how this makeup changes over time. Several channels can be viewed simultaneously side-by-side, with each channel assigned a different hue.

When a user joins an IRC channel, Coterie generates statistical information about the interaction within a channel, and maintains an evolving history of each user and the channel as a whole. Individual statistics—such as message post rate, average message individual length, and length of last post—are computed using a five-minute sliding time window. Group statistics—such as population growth rate, percentage of people that talk, and group average message length—are computed using a 60-minute sliding time window. Sliding time windows are used so that the collection of recent events is reflected in the measures of the group's interaction.

The visualization is dynamic: when a person posts a message to the channel, they will come to the front of the conversation. Their representative oval will bounce from its current location towards the center of the group with the person's name and post displayed above it. The text of the last four posts floats up the screen, thereby allowing viewers to see the relative timing of recent posts within a group. The height of the bounce depends directly on the length of their post. The oval will also become opaque and increase in size by ten percent (every oval has a baseline size of 20 pixels in height). After a short time without further interaction, a person's oval will move back towards the edge of the group, become more transparent, and shrink to the baseline size. The length of time that it takes for the oval to drift back to the

Figure 1: a conversation group in Coterie. People are represented by ovals, and are positioned in the center of the group if they are active or at the edges if they are lurking.

norm depends on the person's recent interaction level.

For example, the more active a person is, as measured by their rate of posting, the longer they will maintain their location around the center of the group, their opacity, and their size. When an oval is at the edge of the group (representing a lurker), it will slowly shrink in size by ten percent of its normal height and width. This size decrease allows a viewer to easily distinguish between a person who has been lurking for a long time (a small oval) and one who has just recently started lurking (an oval of baseline size).

The layout of the group as a whole also changes with time. The distance between the edge of the group and the group's center is directly related to the percentage of active people in that group. A group with a high participation rate will appear more closely knit, with representative ovals clustered around the center of the screen, while a group with a low participation rate will have most of its ovals at the group's edge. The width of the edge (see Figure 3) of the group is dependent on the population growth rate for that group. A group that has more people leaving than joining will have a wider band of people at its edge than one that has only a few people leaving. Since these statistics are computed based on events over the last 60 minutes, the visual display of the group will change dynamically based on its recent history.

SEEING SOCIAL PATTERNS

When using traditional (textual or graphical) interfaces for chat, when a user posts a message there is no distinction made as to whether they are active in the conversation or have been lurking in the background. With Coterie, users appear differently depending on their social behavior. Since active users maintain their presence visually in the group representation, and lurkers fade rapidly back into the background, a viewer can quickly contextualize a user's post, distinguishing a post from an active user who is part of the conversation from an unexpected comment from a lurker.

All users in each IRC channel are shown in this way, and their collective visual portrayal based on their history creates a unique display for each group. This unique display allows a viewer to see immediately the different types of behavior of individuals and different interaction levels of each group. For example, a channel that has a large number of lurkers, but only a few active participants, will have a large edge crowd, with only a few people ever inhabiting the center of the group. A channel with a smaller number of participants, most of whom are active, will have a large percentage of people who move within the center of the group, with only a few people along the edge of the group.

As a channel's social dynamic changes over time, the overall structure of the visualization of that channel will also change. A channel will appear differently (in terms of crowd radius, percentage of users with opaque ovals, etc.) at different times of the day. While the number of users within a channel can be seen in traditional IRC interfaces, changes in interaction level go mostly unnoticed. For example, when users within a group become very active after an extended period of inactivity, their representations will reflect the sudden change

Figure 2: a person's visual appearance when they post is different depending on the history of the user. The person on the left is more historically active than the person on the right, and thus will maintain their visual presence longer.
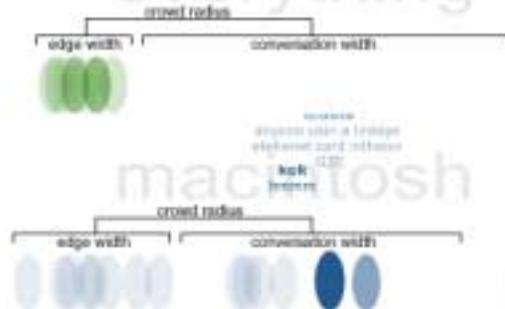

Figure 3: by viewing multiple conversation channels simultaneously, the different types of interaction present in each channel become apparent. Channel everything is a group that has few if any active members, while most of the members of channel macintosh do participate in the conversation.

(slipping into the background quickly). A group that has been sustaining a similar level of activity for a while will have users that maintain their visual presence, and do not fade quickly into the background.

FUTURE WORK

Coterie provides a rich and dynamic visualization of social activity on IRC, however it is just the first in a suite of such visualizations. Keeping track of longer-term statistics, such as presence within a group over a period of days or weeks would allow visual differentiation of long-term users and new members of a group. Drawing from traditional animation techniques, the oval representations can be given more life-like behavior and a sense of intentionality. Simple emotive expressions can be found in user's post and portrayed by changing the composition their oval, making each person's oval more visually unique.

Further information on this project can be found at http://smg.media.mit.edu/projects/coterie.

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