ChatAmp: Talking with Music and Text

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Abstract. Current systems for synchronous, text-based communication offer more varied interactions than e-mail, but cannot easily convey non-verbal or emotional information in an unobtrusive and intuitive manner. In this report we introduce ChatAmp, a new chat system which incorporates music as a central part of social interaction. Music is used in order to create an unobtrusive ambient soundscape that gives information about conversational activity and emotion using changes to instrument behavior. This soundscape acts as a peripheral channel to let a multitasking user monitor the conversation while focused elsewhere without being interrupted by jarring alert sounds. By combining this with non-sequential visualization which groups all of a user's activity in his area of the screen, ChatAmp provides "at-a-glance" information through both auditory and visual channels. Informal user tests support the effectiveness of integrating music and conversation in achieving the goals above and suggest directions for further research.

1 Introduction

Instant messaging (IM) and chat systems have potential for much richer social interaction than asynchronous mediums such as e-mail. However, this potential has been largely unfulfilled by modern text-based interfaces which use bare sequential text. Conveying social cues or emotional information is difficult, and alerts that indicate events while users are focused elsewhere are distracting and uninformative. With this as a problem to be solved, we created a new system called ChatAmp which integrates text, visuals, and music to produce a new style of chat. Unlike existing systems, sound does not act as a mere decoration or distracting alert bell, but provides an unobtrusive ambient channel (reinforced by corresponding visuals) for relaying emotional cues and activity information.

Many past systems have used visualization or sonification to change the experience of chat. The Palace [6] visualizes users with portrait-based avatars that converse through speech bubbles. Closer in spirit to our project are pieces like Chat Circles and Talking in Circles [7] which provide an abstract visual avatar in the form of a circle whose location influences social dynamics. ChatAmp aims to use dynamic positioning of bare text in space to provide at-a-glance information and reinforce musical cues. Sonification projects like Listening Post [2] produce music from chat rooms, but are made to depict thousands of conversations, not to be used during a single chat.

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Recent ubiquitous computing research involves the use of an ambient soundscape to convey peripheral information to the user, as in A Whisper in the Woods [3]. ChatAmp provides a similar ambient channel specifically for chat, using music as a more natural sound environment than abstract sounds.

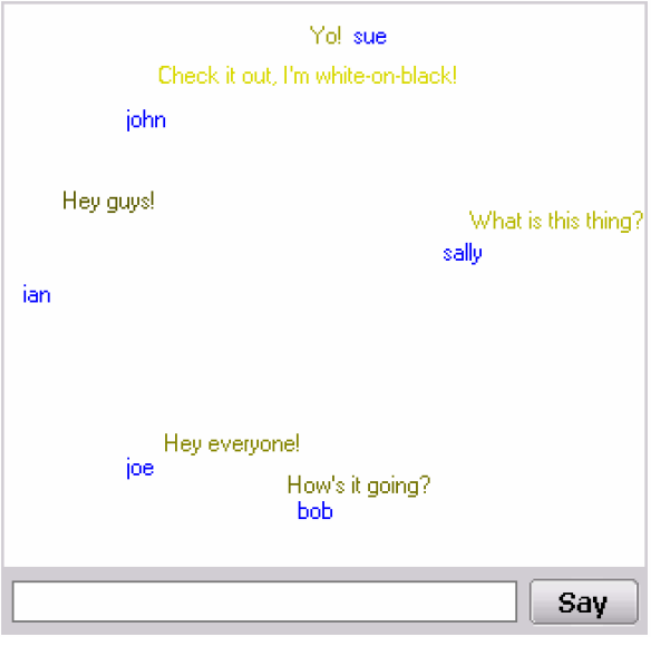

Fig. 1. Shot of an example conversation in ChatAmp. Usernames and corresponding messages are grouped in clusters and arranged in a roughly circular configuration.

2 ChatAmp

ChatAmp's visualization (see Fig. 1) arranges text in 2D to give activity information and support musical cues. Users are identified by "clusters" of text that consist of any recent messages plus the username indicated in a different color. Presence of these clusters on-screen gives an immediate indication of the number of people participating (and thus the size of one's audience). Messages fade and disappear over time, and when all are gone a user is considered inactive—this causes his instrument to stop playing. When an instrument is playing, the username on-screen comes to life, shifting back and forth with each note. Thus, both visual and auditory cues let the user see and hear who is talking, and give a brief history of activity.

Our design centers around the integration of music into a conversation, and uses changes to existing music data to enhance communication rather than generating new music algorithmically. The main issue we addressed is how to convey information through and give meaning to this music in the context of a text-based conversation.

To truly enrich users' communication, a mutual relationship between music and conversation is needed. We designed for such a relationship as follows:

- Given an arbitrary song, instruments are split among users of the chat space, and each participant is associated with the sound of a specific instrument.
- Music is audible to all users and is affected in real time by user activity. Instruments of active users produce sound while instruments of inactive users are silent.
- Visualization of the conversation is directly affected by the music. The visuals associated with one user will move in time with the sound of her instruments.

The effect of music on the visual display serves to strengthen the mapping between user and instrument. It is easier for a user to detect the effects of his activity if feedback is received through both visual and auditory information, and if these two are in concert then the outcome should be further improved [4].

Using music in this manner also allows for the communication of information to the user unobtrusively in the periphery, while her attention is on another application. Rather than using sudden discrete alert sounds as in current IM and chat systems, ChatAmp makes changes to music that is always present in the background. Because each user is associated with an instrument, an "auditory glance" will yield immediate information about who is active and who is inactive.

The association of a user with specific sounds also introduces the possibility of communicating emotion through the peripheral audio channel. An early approach to this which we take as a preliminary experiment is to detect a basic set of emoticons in a user's messages and respond with a simple operation on their instrument output. In our first attempt we use a simple pitch bend: an instrument bends up for happy emoticons and down for sad. Pitch bends were chosen because pitch-based representations of data like Earcons [1] have been proven effective as information displays.

ChatAmp was implemented as a Java Swing application. MIDI was selected as our music format to make real-time manipulation of songs straightforward.

3 Evaluation

Preliminary, informal evaluation of ChatAmp was conducted by letting ten students use the program and collecting feedback through verbal interviews. After brief testing of different genres, electronic music was selected for use with the program, as the removal of arbitrary instruments is much more likely to leave a coherent song.

With no instruction, users immediately intuited the function of text clusters in identifying individuals. Due to the motion of usernames, several users described their roles as "dancers" against the backdrop of their own words. Based on this feedback, the "avatar" in ChatAmp appears to arise not from spatial representation but rather from kinetic properties of text: users described each other as having different personalities based on a song's instruments. This seems to indicate that personality can be embodied in forms other than avatars based on static 2D images or 3D models [5], and prompts reconsideration of the nature of online avatars.

Testers found it very easy to judge approximately how many users are active at a given time by listening to the program's music output or glancing at the visualization. Determining the identity of specific individuals from the sound of their instruments

was a much harder task, with limited success. Whether this would improve with extended use is a question for future investigation.

Emotional cues through music were the one element of ChatAmp that users did not learn on their own. After being informed about pitch changes in response to emoticons, however, testers easily identified emotional events from prominent instruments in the song.

An unexpected finding is that the silence of inactivity is perceived as awkward and results in pressure on users to keep typing. This causes tension if messages fade too quickly. The fade time in our first implementation was 10 seconds, and this proved to be much too fast for relaxed conversation.

4 Future Work

Immediate work to follow in ChatAmp's development will involve detailed studies to determine its effect on users in comparison to current chat applications. Two important items to test are satisfaction levels and impact on productivity for tasks performed with different types of peripheral audio channels. Also, by comparing the number of messages sent with and without audio, we hope to quantitatively measure the effect of ChatAmp's music on user activity. Finally, a survey-based study will yield information about how an individual perceives others differently when their spatial or musical configuration changes.

The next important step is to consider how to redesign the UI of ChatAmp to provide users further ability to express themselves in new ways. Giving users more explicit musical control may allow for richer and more intuitive interaction.

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