Telemurals: catalytic connections for remote spaces

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Abstract
Mediated communication between remote social spaces is a relatively new concept. One current example of this interaction is video conferencing among people within the same organization. Large-scale video conferencing walls have begun to appear in public or semi-public areas such as workplace lobbies and kitchens. These connections provide a link via audio and/or video to another space within the organization. When placed in these spaces, they are often designed for casual encounters among people within that community. Thus far, communicating via these systems has not met expectations. We are exploring a different approach to linking spaces through the use of what we are defining as a social catalyst. These catalysts are incorporated into our installation, *Telemurals*. An ethnography study of *Telemurals* will be conducted between two graduate dormitories to see how the catalysts affect interaction.

1 Introduction

In this work, we are creating an audio-video communication link between remote spaces for sociable and casual interaction. Some drawbacks to current systems that have been studied include lack of privacy, gaze ambiguity, spatial incongruity, and fear of appearing too social in a work environment [5]. We believe that many of these problems stem from designing interfaces that directly map to face-to-face interaction.

With this work, we are diverging from the approaches of current audio-video connections and focusing on encouraging social interaction by designing a series of social catalysts. We are not creating a substitute for face-to-face interaction, but rather new modes of conversational and physical interaction within the spaces.

2 Social Catalysts

The main idea of the social catalyst is to initiate and create mutual involvement for people to engage in conversation. For example, in a public space, it is not customary to initiate conversation with random strangers. However, there are events that act as catalysts and connect people who would not otherwise be communicating with each other.

Such a catalyst may be an experience, a common object like a sculpture or map, or a dramatic event such as a street performer. Sociologist William Whyte terms this phenomena triangulation: *"A sign of a great place is triangulation. This is the process by which some external stimulus provides a linkage between people and prompts strangers to talk to each other as if they were not*." [6]

Our hypothesis is that the creation of a social catalyst as an integral part of the social environment will aid mediated communication between spaces by providing a spark to initiate conversation and the interest to sustain it.
The social catalysts of our installation extend Whyte's triangulation principle into the display and interface of the connected space. The form of our catalyst is abstract. It alters the space and communicative cues between the two spaces. One such catalyst is a connection where current conversation of the users appears as graffiti in the environment. This allows the occupants to see they are affecting the space and might encourage them to alter it. While the possibilities are infinite, the challenge is determining which agents on the interface are effective as social catalysts and why.

In our linking of two spaces in the *Telemurals* installation, we are augmenting the appearance of the familiar audio-video wall interface with stimuli that are initiated at either end of the connection. The wall is intended to be not only a display, but an event in itself; the system becomes both medium and catalyst.

3 Telemurals

Telemurals is an audio-video connection that abstractly blends two remote spaces. The initial setup is straightforward. Two disjoint spaces are connected through an audio-video wall. Video and audio from each space is captured. The two images are then rendered, blended together, and projected onto the wall of their respective space.

Duplex audio is transmitted between the two locations. To provide feedback and comic relief, the audio is passed to a speech recognition algorithm. The algorithm returns text of the closest matching words in its dictionary. This text is then rendered on the shared wall of the two spaces. The goal here is to make it clear that the users' words are affecting the space without necessarily requiring 100% accuracy of the speech recognition system.

A figure of the current implementation of *Telemurals* is shown in Figure 1. Silhouettes of the participants in the local space are rendered in orange. The participants at the remote end are rendered in red. When they overlap, that region

becomes yellow. The aim of this cartoon-like rendering is to transmit certain cues such as number of participants and activity level without initially revealing the identity of the participants.

Figure 1. Current Telemurals implementation.

Participation is required for this communication space to work. To reinforce a sense of involvement, we provide the system with some intelligence to modify its space according to certain movements and speech patterns. That is, the more conversation and movement between the two spaces, the more image detail will be revealed to the participants at each end. The silhouettes slightly fade to become more photo-realistic (see Figure 2). This prompts the participants to move closer into the space to see. If conversation stops, the images fade back to their silhouette rendering. We want the participants to choose their own level of commitment in this shared space [4]. The more effort they exert, the more they see of both spaces.

Figure 2. Example of fading from silhouette towards more photo-realistic.

Much thought has been given to the design of the renderings in *Telemurals*. We wanted to maintain the benefits of video in their simplest form. Adding video to a

communication channel improves the capacity for showing understanding, attention, forecasting responses, and expressing attitudes [3]. A simple nodding of the head can express agreement or disagreement in a conversation. Gestures can convey concepts that aren't easily expressed in words; they can express non-rational emotions, non-verbal experiences. Yet these cues are not always properly transmitted. There may be dropped frames, audio glitches. Lack of synchronicity between image and audio can influence perceptions and trust of the speaker at the other end. Other challenges include equipment placement. For example, camera placement has long been a reason of ambiguous eye gaze in audio-video links. A large camera offset gives the impression that the person you are speaking to is constantly looking elsewhere.

With *Telemurals*, we are creating an environment where rendered video maintains subtle cues of expression such as posture and hand motion, yet also enhances other cues. For example, changes in volume alter the style of the rendered video. By adding another layer of abstraction into the video stream, we can enhance cues in a manner that is not possible in straight video streams.

In this project, the abstraction of person, the blending of participants, the graffiti conversation, and the fading from abstract to photo-realistic are the social catalysts for the experience. This new wall created by filtering creates an icebreaker, a common ground for interaction, and an object for experimentation.

Telemurals is currently installed in a common area within the Media Lab. The first public *Telemural* installation will connect two recreation halls of MIT graduate dormitories. The connection will run for two months during a social hour at the two dormitories.

4 Evaluation

The field for this observation study is the semi-public space within the two chosen dormitories. We expect the participants to be graduate students who live in the respective dormitory and their friends. We are primarily interested in seeing, (1) how people use *Telemurals*, (2) if the catalysts attract them, and (3) how we can improve the system.

4.1 Methodology

The *Telemurals* observation will take place in March and April of 2003. *Telemurals* will run for two hours each Wednesday and Sunday night in conjunction with a coffee hour/study break. Signage will be placed in the

entryways of both spaces to describe what is being transmitted and the privacy concerns of the project.

Video cameras will record people in front of both *Telemurals* spaces. The footage from these tapes will be used to annotate patterns of use for this study and will then be discarded. There will also be a person at each *Telemurals* site to mitigate technical difficulties. The videotape and notes will then be annotated. Initially, we are interested in observing:

- How long people speak using *Telemurals*
- The number of people using the system at any one time
- The number of people present but not interacting
- The number of unique users (if possible)
- The number of repeat users (if possible)
- The number of times and the duration that people use *Telemurals* in one space only
- The number of times and the duration that *Telemurals* is used in photo-realistic mode
- Repeated patterns of interaction: gestures, kicks, jumps, screams

These are factors that we believe are indicative of levels of interaction. However, one must always be open to the unexpected and attempt to find other underlying patterns as well in studying the social catalysts.

4.2 Privacy

When running such a project and study, it would be irresponsible to ignore privacy concerns. The audio and video transmitted in the *Telemurals* interface is not saved or stored in any way. We hope to mitigate this problem with proper signage.

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