

GroupWear: Nametags that Tell about Relationships

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ABSTRACT

We have built a set of computationally-augmented nametags capable of providing information about the relationship between two people engaged in a face-to-face conversation. This paper puts forward criteria useful for the design of such interpersonal augmentation, experiences that inform the principles, and initial evidence of their success.

Keywords

wearable computing, augmented reality, groupware, Computer Supported Cooperative Work (CSCW)

INTRODUCTION

There is growing interest in “active badges” and other wearable technologies, for example to determine locations or identities of people [4]. But research has focused on how badges can facilitate interaction between people and machines, not people and people. We are building a new set of nametags, called GroupWear, that display information about the *relationship between people*—for example, providing a measure of how much two people in conversation have in common [1]. After a brief description of the first major GroupWear trial, and related research, we will present two design principles we developed through our work augmenting face-to-face interaction.

DESCRIPTION OF FIRST USER TRIAL

We first deployed the GroupWear tags at an annual gathering of several hundred university faculty, students, and businesspeople. When the participants arrived at the event, they were given their GroupWear tags, which had their name and affiliation printed on them like regular nametags (Figure 1). Interspersed through the reception area were five kiosks, each holding a poster-board with a multiple-choice question and three buckets corresponding to each answer. Questions were chosen to be relevant and engaging for the given community—e.g., “What is your biggest fear about the Internet? (a) Loss of privacy, (b) inequity of access, or (c) lack of meaningful content.”

Participants then wandered among the kiosks, answering the questions by dunking their tag into the appropriate bucket. A small device at the bottom of the bucket instantaneously “programmed” their badge with the answer they had selected. Later, when two participants met during the course of the event, their tags invisibly exchanged information (via infrared communication), and then flashed a pattern of lights, indicating how many questions they had answered in common.



FIGURE 1: THE GROUPWEAR TAG

RELATED RESEARCH

GroupWear tags superficially resemble other “active badge” technology. Such badges may determine their wearer’s location and identity for building automation purposes, but have not been used to extend the main function of a nametag: to facilitate interaction at a social event.

Augmented Reality (AR) is concerned with how technology can insert context-relevant pieces of information into real-world environments [2], and therefore it is more applicable to GroupWear. Much of this work is focused on augmenting physical environments such as museums and airplanes, however—not on augmenting interactions between people.

Much of the work in AR that does focus on augmenting relationships (e.g., the Remembrance Agent [3]) is built with head-mounted displays. Such technology is costly, and is cumbersome to experiment with the large numbers of interacting people (several hundred) with which we have run GroupWear trials. More importantly, these displays violate an important social norm, since their contents are visible only to their wearer, thereby prohibiting anyone else from knowing what the wearer is looking at. *Both these factors make such technology more useful for augmenting individuals, not relationships.*

DESIGN PRINCIPLES

One Space per Social Event

A social event provides a coherent physical space for people to carry on their face-to-face interactions. Adding traditional desktop-style computers to such an event can render the space incoherent. This is because a traditional computer in a social environment creates two opposing spaces: the space contained by the room and the space contained in the screen. These spaces are on different scales and have different methods for interaction. For example, one moves through the space of the room with one's feet, but through the space of the screen with one's hand. Many people can simultaneously participate in exploring the physical space, but only one can enter the on-screen space at a time. Museums frequently suffer from this problem when they drop computer kiosks into exhibit spaces. As an interface designer, one can feel the tension while just passing through such spaces.

We designed the GroupWear tags to integrate into the physical space of face-to-face conversations. It was a challenge to integrate tag programming into this same space, however. What if we took the typical programming interface of the five questions, each with three radio button answers, off the screen and distributed it through a room, so the programming space and the social space were intertwined? This fusing of programming and social space yielded the approach of the "Bucket Kiosks." Instead of removing people from the social context, the bucket kiosks created a new sort of meaningful social interaction: guests engaged in conversations around the bucket kiosks, taught newcomers how to use them, and debated the questions as they made selections.

Build User Trust in Augmentation

It is not enough for any augmenting technology to simply insert context-sensitive information into a real-world environment. Because these technologies are usually unfamiliar, and often appear "magical," they must also help users learn to trust that their display is informed by what it pretends to be. As an example of a device that does not obey this principle, consider the digital road-side signs that claim to display a driver's speed. Because many cars often pass these signs in rapid succession, and because the information on the sign does not hail a particular driver, a driver has no reason to trust that the information pertains to him or her.

Our first goal was to make the GroupWear nametags trustworthy. To that end, we did extensive testing on the infrared communications mechanism to ensure that two people's tags were communicating exclusively when they were facing each other at a normal conversational distance. In other words, users would trust their tags only if both they and their tags had a similar understanding of what it physically meant to be in a conversation.

Although we did not realize it at the time, our decision to display something that was symmetric (e.g., how much two people had in common) on two interacting badges was crucial in helping users build trust. By observing that both

badges were flashing the same pattern, two people in a conversation could be confident that this pattern represented their relationship. We also designed the display to make it easy for people to verify its accuracy with a quick conversation.

CONCLUSIONS

The above design principles contributed to the success of the GroupWear nametags. The bucket kiosks integrated the tag programming into the primary social space, creating an enriched place where people were seen to linger and converse for long periods of time.

People clearly began to trust their tags. Informal observation revealed that after a short while, people would stop paying attention to their own tags and start looking only at their conversation mate's. Indeed, people formed such a strong bond with their tags that hundreds of them continued using them through dinner and into the next day—long after we imagined—causing some unexpected battery problems.

The GroupWear tags successfully augmented people's conversations during the meetings. The best evidence of this came from people's ability to draw on their knowledge about their relationships to make sense of the tag's information. For example, we witnessed two coworkers—one more senior than the other—interact. Their tags flashed four red lights, showing that they disagreed on four questions. Instead of interpreting this as a negative, however, the more senior colleague said "Perfect. We are complementary to each other." On another occasion, a participant saw that he was a better match with two people at the same company than they were with each other. The consensus was that this was a very good thing, since this person actually served as a liaison between these two people's groups.

Currently, we are trying to further solidify these design principles. We are engaged in more intensive user studies with the current generation of GroupWear tags. We are also further elaborating these principles in a new generation of more powerful nametags.

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