Connecting Families through Technology

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STATEMENT OF INTEREST

Over the last decade, research in the CHI and CSCW communities has expanded in scope to move away from a solely-workplace focus to investigations of the ways in which family members appropriate and make use of technology as a part of domestic life. Our research premise is 'the home is not the office'; in order to understand how to design technology to fit within and extend the routines of family members, one must carefully consider the intricate nuances of domestic life, including family and friend relationships and the everyday routines people employ. Within this space, our research broadly focuses on the study and design of ubiquitous and mobile technologies for family members. This has included the study of communication and awareness needs for families [1,7], family calendars [8-10], family photo sharing [11,13], and video communication systems for families [2-4,6,13]. We are now building on this research to explore: connecting family members over distance in situations where technology may be limited, the design of systems for families to share health information, and the design of technologies focused on mobile shopping.

We are interested in participating in this workshop to discuss domestic computing research and establish collaborative ties with other researchers and designers who are similarly studying families and technology design for domestic life. We are also interested in helping with the workshop organizers' efforts to create a bibliography of papers related to technologies for homes and families.

RECENT RESEARCH

Many people desire to stay in touch and be connected with their family members and loved ones when they are separated by distance [1,7,15,16]. For example, grandparents want to know about their grandchildren's activities, couples wish to stay connected when they travel, and parents desire to know the whereabouts of their children throughout the day. Given these needs, our recent research and collaborations have focused on designing technologies to support family connectedness over distance. One technology that shows promise in these situations is video-based communication systems, such as Skype or Apple's FaceTime, given their ability to come close to replicating face-to-face communication. In our studies of such systems, we found that families with children, as well as distance-separated partners often left their video link open for extended periods of time in order to see the remote household's activities, and to simply feel the presence of the remote family members [2,12]. However, most existing video chat systems are not designed to support these routines and extended usage very well; instead, they are designed to be used like a telephone where a person calls another for a short duration of time [2,6,12].

Figure 1. The Family Window.

In order to better support the sharing of everyday life over video, our recent research has explored the design of video communication systems for families called *media spaces* These spaces enable video links to intentionally be left 'always-on' to easily share normal everyday situations between two or more locations.

1. *The Family Window:* The Family Window was an always-on media space that connected two homes with a continuous video link [3]. Figure 1 shows the design running in a touch-sensitive tablet display, prototyped to act as an information appliance. With the system, families could see into the remote family's home, much like they were visiting it as guests. While this may seem 'creepy' or privacy-intrusive to some, our field trials revealed that families really valued being able to see the remote family members and this 'seeing' led them to feel closer to their loved ones [3,6]. In addition, families were not concerned with privacy issues after only a few days of usage.

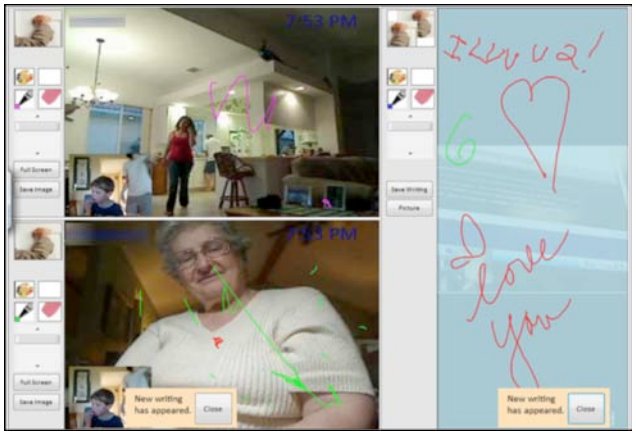

Figure 2. Family Portals.

2. ***Family Portals:*** The Family Portals system was an always-on media space designed to explore multi-family connections and allowed three households to connect together and share their lives through a video link [4]. Figure 2 shows the design, again as an information appliance in a tablet computer, where the local family sees the two remote families' homes (left). Family members can also leave handwritten messages for one another (right). Our field trials revealed that, again, family members valued being able to see the lives of the remote families; in this case, it was two remote homes and not just one. Yet the addition of a third family led to a larger number of privacy concerns, especially from those family members who did not share a strong relationship with one another [4].

3. Peek-A-Boo: Peek-A-Boo was a media space that we designed to explore how family members could extend their media space viewing capabilities to a mobile device and be able to 'see' family members at home while one is out and about [13]. Peek-A-Boo shares live video between a mobile phone and digital frame in a family's home (Figure 3). The mobile client is turned on and off by launching/closing the iPhone application; this intermittent usage is the reason for the name, Peek-A-Boo. The home client is always running and visible on a dedicated display. Once the iPhone application starts, video is automatically transmitted between the two devices [13].

4. Honey: Honey was a media space we designed to investigate how we could connect a parent at work with his partner and children at home during the day [6]. Figure 4 shows the media space running in a tablet computer with attached keyboard. Always-on video (right) provided views between the work office and home kitchen and a chat channel (left) allowed partners to asynchronously or synchronously message each other during the day. Our autobiographical usage of the system showed that the placement of the media space within the work office was critical to avoid privacy issues arising where office visitors could see into the home [6].

Figure 3. Peek-A-Boo: mobile client (left), home client (right).

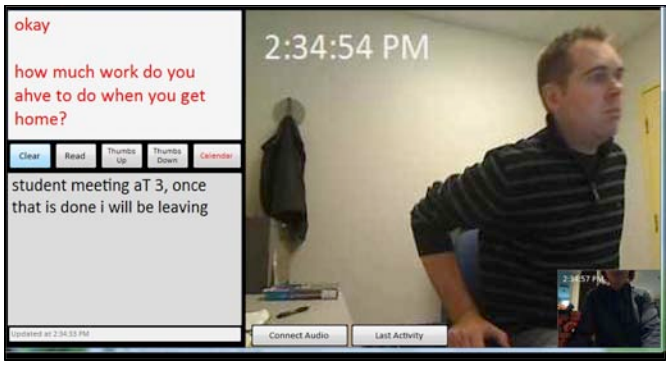

Figure 4. The Honey Media Space.

CURRENT RESEARCH PROJECTS

Currently we are pursuing a number of different projects that build on our recent research and expand it in new ways.

Enhanced Media Spaces

We are expanding our media space research to look at two new situations. First, we are exploring the social and technical challenges of creating and using a video conferencing system that supports multiple cameras and multiple displays. Such technologies are available for office environments, but, to date, nobody has explored their usage and potential benefits in domestic settings. Second, we are investigating how family members can communicate over large distances where a mismatch in technical capabilities limits the use of devices for video communication. For example, imagine trying to connect between two homes where one has high bandwidth capabilities and one is severely restricted with its Internet connection. Our plan is to design technologies that bridge this type of technological gap and additionally address the social challenges that emerge as a result.

Health Information Sharing

We are extending our studies of family communication and information exchange to focus specifically on the sharing of health-related information between family members and close friends over distance. Our research in this area aims to understand how to design a personal health record system that assists families coping with chronic illnesses. Such a system is envisioned to provide the means to store medical information, manage expert resources, share data with various social groupings, and integrate the forms of media required by remote family members to maintain feelings of connectedness with patients.

Mobile Shopping and Trust

There has been widespread growth of mobile shopping and buying; with this comes a need to understand how and if trust issues manifest themselves in mCommerce activities and how to design for trustful mobile transactions. In past research we have used daily electronic journal entries in hopes to better understand their routines and, specifically, issues or moments related to trust in their mCommerce activities [5]. Our results describe a variety of usage patterns including spontaneous purchasing and routine shopping where people gravitate to their mobile device even if a computer is nearby. Participants generally faced little issues with trust because they had very limited access to unknown companies and app marketplaces or family and friends offered a form of brand protection. Understanding how family plays a part in establishing this trust is a focus of ours moving forward.

BIOGRAPHIES

Carman Neustaedter is an Assistant Professor in the School of Interactive Arts + Technology at Simon Fraser University, Canada. His research is in design, human-computer interaction, and domestic computing. Here he focuses on the design and use of technologies for connecting people who are separated by distance or time. This includes design for promoting family connectedness, support for workplace collaboration, and bringing people together through pervasive games. To learn more about his research group, the Connections Lab, visit http://clab.iat.sfu.ca

Tejinder Judge is a User Experience Researcher at Google. She studies users and shares insights to make Google's social products more usable, useful, and delightful. Her research background is in domestic computing with a focus on connecting families separated by distance. She received her Ph.D. in Computer Science from Virginia Tech.

Serena Hillman is a PhD student in the School of Interactive Arts and Technology at Simon Fraser University, Canada. She studies the characteristics of user's perceived trust concerns related to everyday routines and social behaviors while participating in mobile shopping and mobile commerce.

Erick Oduor is a PhD student in the School of Interactive Arts + Technology at Simon Fraser University, Canada. He is investigating the challenges that are involved in the design of a media space that can assist family members who are separated by distance keep in touch with each other akin to how they would feel connected while at home. This includes designing for video technologies to support the everyday activities of people through space and time through the use of mobile devices.

Carolyn Pang is an MSc student in the School of Interactive Arts + Technology at Simon Fraser University, Canada. Her background includes ten years of professional experience delivering design projects spanning the arts, service, and public sector industries. Carolyn's previous research explored the design of interactive environments for government bodies to promote civic engagement.

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