Awareness system for children in distributed families

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ABSTRACT
In recent decades the number of distributed families has increased, making it harder for family members to maintain a feeling of intimacy. In the traditional, closely located family, family members such as grandparents, and cousins are involved in a child's everyday life, contributing to his informal education and creating consistent intimate relationships. Current communication technology (such as telephone and email) doesn't support this kind of interpersonal relationship in distributed families. This paper presents an early prototype of CASY – a new communication tool, designed with children in mind. Using CASY, children send other family members video snippets in the context of routine daily activities, such as "good morning" and "good night" snippets. The recipient views the video snippets asynchronously, in the context of going to sleep or waking up, creating a non-stressful, continuous communication channel. CASY is designed to enhance connectedness and intimacy between distributed family members in a subtle and appropriate way.

Keywords
Computer-mediated communication, CMC, grandparent, grandchild, home, awareness, social, presence, telepresence, lightweight communication, asynchronous.

INTRODUCTION
In recent decades families have become more geographically distributed, making it challenging for family members to maintain a feeling of intimacy. Distributed families face many challenges trying to maintain a sense of intimacy: Different time zones, limited conversation topics, and limited knowledge of the other's availability and mindset, to name a few. When Distributed family members communicate, they share practical information (when and where to meet next time), special occasions (e.g. birthday events or job promotion), rather than emotional information. Patrick et al 2001 [1] found that "communication for shared experience, so important in maintaining distance relationships, is not adequately supported by the communication media available today". The result is a more fragmented relationship, which gradually leads to less intimacy. William Schutz's Interpersonal Theory, as described in Washington 2001 [2] lists three factors that motivate interpersonal relationships: Sense of control (influence), inclusion, and affection. In contrast to closely located family members, it is challenging for distributed family members to satisfy these motivations. In the past few years, the "Awareness and Presence Systems" field has emerged with pioneering projects such as Casablanca, D. Hindus S. et al, Portholes, Dourish, P. et al, Astra, P. Markopoulos, et al, Aroma, Pedersen, E.R et al [3, 4, 5, 6], focusing on connecting distributed family members in a more meaningful way.

Figure 1. family members and status icons.

This paper presents the CASY awareness system, designed to enhance connectedness and intimacy between children and their distributed family members, integrating audio/video messaging, asynchronous communication, and context-based delivery.

USER'S SCENARIO
It is a rainy afternoon in San Francisco, CA. Martha is coming home from shopping. She glances at her CASY picture frame on her furnace, showing three portraits of her grandchildren. From the portrait's icons she sees that Ethan (five years old, Chicago, IL) is not at home right now, Maya (four years old, Amsterdam, The Netherlands) is asleep, and Aden (nine years old, Brooklyn, NY) is at home. Martha decides to leave video messages to Maya and

Aden. She touches Maya's portrait and records a 'good morning' message for Maya (who is currently asleep). For Aden's she decides to read a few pages as a 'good night' story, from the new book she bought him: 'The Lion, the Witch and the Wardrobe' by C.S. Lewis.

A few hours later, at his home in Brooklyn, NY, Aden is about to go to sleep. He says good night to his parents, and goes to bed. He glances at the small screen mounted in his CASY pillow, and says 'good night' to the portrait of Martha, his grandmother. Martha's portrait reacts with a gentle warm smile, and he sees that there is a new 'good night' message waiting from her. Aden touches the screen to activate the audio/video message – Martha reading him a bedtime story. He relaxes in his bed, enjoying his grandmother's soothing voice. When the message is over, he can't wait to hear the rest of it. He replies to Martha through his CASY pillow, saying how much he wanted this book and pleading her to read him a few more pages when he wakes up the next morning.

IMPLEMENTATION

CASY is a client-server system. Multiple clients can communicate with a shared web server and perform queries on a shared database. Each client has the following modules: Record, Context, Sensing, and Display. The server has the following modules: Communication and Database.

The graphical user interface (GUI) is implemented in Java. The video capture is implemented in C#.

The record module uses a video camera (web cam), enabling easy recording of a video snippet. When the user records a message the GUI passes responsibility for creating the video message to the C# module. The C# perform the webcam capture.

The context module allows the sender to attach the snippet to a specific daily event in the recipient's life. The recipient defines the context events. The GUI creates a context object that is sent along with the video snippet to the web server.

The database module stores the video snippets, including the context information. When possible, the database uses the communication module to download the video snippet to the recipient's client.

The Display module at the client side is notified of a new message when a new snippet is available, but does not make it available for the recipient to view until the Sensing module verifies that the event has occurred.

The Sensing module has two methods to determine that an event has occurred: user-initiated or timer-initiated. User-initiated occurs when the recipient manually confirms an event, e.g. a child selects the "I am awake" icon in the client interface. The timer-initiated occurs when a pre-defined time-based event has been set, and the time has arrived, e.g a setting that a child wakes up every day between 7.30am-8.00am.

INITIAL EVALUATION

We have conducted a preliminary study with four sets of grandparents and their grandchildren. The families filled out a questionnaire about their current communication patterns and in a period of two weeks were asked to record video/audio messages, using a digital camera. The messages were sent as email attachments. The sender specified in the email if the message should be viewed in the morning, or at night before going to bed. The families logged the communication patterns for that period including number of phone calls, and at the end of the two weeks filled out another questioner. Preliminary analysis of these questioners show that even with the obstacles of current technology (such as ISP's size limitation on email attachments), grandparents reported that the asynchronous, context-based video communication increased the number of phone calls between them and their grandchildren, and increased their feeling of "connectedness".

FUTURE WORK

We plan to design new tangible interfaces for the Sensory and Display modules, making it easier for children to set their current state (I am going to sleep, I just woke up etc.) We plan to conduct a follow up study, this time using the CASY system, and compare our findings to the preliminary study. We plan to create new versions of CASY, designed for children-to-children communication.

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