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Wall[ace]

an ambient community experience

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“ **In the home of the future, walls will no longer divide.**

They will unite.”

Executive Summary & Problem Definition

Intel is developing cutting edge technology that can transform normal homes into smart homes. This transformation is made possible by high tech camera-projector units that have awesome potential for receiving voice and gesture commands and for displaying visual interfaces on any surface. Residents will live in an intelligent home environment that can accept commands and display information fluidly. Such technology is paradigm changing, and with it the experience of being at home will be unlike anything it has been before.

Certainly, such technology can make our lives at home more convenient. But can it accomplish something deeper? Can the home of the future help satisfy essential human needs?

We believe that it can. While exploring the home of the future as a design space, we asked ourselves this driving question:
How can the home of the future facilitate community?

The Team

Daren Chaisy

Why IxD?

I chose to take Interaction design because I wanted to gain a broad understanding of what human computer interaction entails. Interaction design was listed in my HCDE major as a class that gives a good foundation for what HCI is all about. This class helped me gain insight into how to start developing ideas to make interfaces for technology (new and old), and allowed me to collaborate with students from many different majors that all focus in HCI but specialize in many different aspects of the field, such as usability, design, visual communication, and computer science.

Why Community?

I chose to enter the group that focuses on community because it seemed to be the most challenging. People today are caught up in social networks and video chats (Facebook, MySpace, Skype, etc…) and there hasn't been a plan discussed on the next step of what social networking and video chat can look like in the future and in the comfort of one's home. I also chose to join the community group because it dealt with sharing life experiences with people who don't necessarily need to be there in person, and it doesn't restrict a person to stay in one area to communicate with someone like a computer restricts people. Creating an interface and designing an interaction with an aim to maintain closeness in long-term relationships is something that seemed the most innovative to me, compared with all the other groups' ideas.

Craig Kochis

Why IxD?

I wanted to get a better understanding of the design process, as well what is considered "good design".

Why Community?

I feel that online communities are becoming more influential in everyday life, and I wanted to explore new possibilities for ways they could be represented. The way people use technology as a means of interacting is of particular interest to me.

Jon Sandler

Why IxD?

I took this class because I wanted to gain a broader understanding of the design process. As one of the only design classes I was able to take outside of the major, I jumped on the opportunity to learn about anything I could that was design related. I hoped to get a peek into the design world, and build my skills in whatever area I could in preparation for the design entrance exam.

Why Community?

I chose the community group because from the start, a key word floating around was "avatar" and I thought that that would be interesting. I thought of the ways we represent ourselves now, and how that might change in the future to have our own little emissaries so to speak. I use social networking every day, and I have read a lot about the next generation of the internet and interconnectivity between people. The idea also seemed to have potential to bring people together in a novel yet effective way, which is important to me, so I decided to join the group and see what we could come up with, and I think that it was a well suited fit for me.

Jacob Warren

Why IxD?

I want to understand how design decisions translate into user experiences.

Why Community?

I believe that turning the home space into a social space changes the home environment in radical and exciting ways. I want to understand how this interaction can be made possible for users and what kinds of potential experiences they will have with it.

Leslie Ferguson

Why IxD?

I took this interaction design class because I am particularly interested in the big-picture process of designing how and why something works a certain way. I also took this course because unlike other design courses, there is much more freedom to define and create a solution to a problem that interests you. Furthermore, as a double major in both design studies and computer science and I see interaction design as an interesting and challenging cross-section of my two interests.

Why Community?

I decided to focus on the idea of facilitating community in the home of the future because it is currently such a popular and changing topic. Through the internet, the idea of a social network and one's sense of community has been entirely redefined. Furthermore, I think that the definition will continue to change as technology develops. By focusing on the community, I hoped to explore and have a say in how the this technology could impact our current definitions of these terms.

Ideation

Our mission as a design was to find a way to turn the home into a dynamic social network. Our first task was to brainstorm all the possibilities such a network implied. Our brainstorming sessions were fueled by the following questions.

How will people in a social network be represented by the system?

Now that we were relocating the social network from the computer screen to the surrounding home environment, we need to consider novel ideas for representing people in that network. In the extreme case, the walls of the home could be turned into visual portals into other people's homes, surrounding the user with constant live coverage of family and friends in their living spaces. Clearly, a less invasive solution needed to be devised. We concluded that live broadcasts of people in the network needed to be deliberately requested by the user and consented to by the network contact. When the network contact is not being shown live, he or she could be represented by a digital representation, an avatar.

What kind of community can this technology facilitate?

Will this technology help users reach out to strangers all over the world? Or will it be used to bring neighbors closer together and orient them around shared community goals? Can it be used to connect family members separated by distance? Or is it just a new way to hang out with friends? All these suggestions are possible, making the full gamut of possible networks overwhelming to a constrained design project. We chose to limit our focus on networking common acquaintances and family members.

What kind of experiences can users have with their community?

The face-to-face, live broadcast interaction made possible by this technology is a dynamic way for people to interact. But if users can only have conversations, they are apt to just pick up the phone as they always have. Somehow it needs to be possible to share experiences beyond conversation. These experiences might include playing board games, sharing meals, introducing new acquaintances to old acquaintances, or cooking together.

How is the house going to be used to host the interface?

The social network now occupies the three-dimensional, ambient atmosphere of the home. Yet the home is not a blank canvas for information display like the computer screen is. The home is composed of rooms, each characterized by a purpose, a feeling, and a connotation. Should the avatars arbitrarily inhabit these rooms? Or should an avatar's presence in a given room have some meaning? We believe that meaning should not be dissociated from location, that the presence of an avatar in a room in the user's house implies the presence of the contact in that same room in their own house.

How can this system benefit users?

As long as users have enough control over their own privacy, they can use this system to feel closer to their friends and family, to feel like they can always be in the loop, to be home alone yet totally social.

Meet Wall[ace]

The design decisions from our brainstorming sessions synthesized into Wall[ace] - an ambient community experience.

Final Design

Wall[ace] is a social networking interface that can be controlled from almost any location in the home.

Avatar-Based Network

The social contacts in the user's network are represented by avatars. These avatars are projected onto the wall and seem to inhabit the home environment. The dwell in rooms that are similar to the rooms being occupied by the contact in his or her own home. They perform actions that represent the contact's own actions. As a result, the user can tell at a glance what people in his or her network are up to. Naturally, the user is also represented by an avatar in the homes of others. Because the avatar is a digital representation, it is a step removed from reality and the privacy of all users is protected.

The avatars function as a starting point for interaction. The user can receive messages from an avatar, talk to an avatar directly, or request to have a live, face-to-face interaction with the person represented by an avatar. If the user wants to see a certain avatar that is not in the same room as the user, he or she can verbally tell Wall[ace] to bring the avatar into the room.

Facilitates Real Experiences

The next level of interaction beyond avatars is live interaction. In this setting, the living space of a given contact is projected onto a wall in the user's home. Likewise, the user's living space is projected onto a wall in the contact's home. User and contact can now have face to face interaction. This interaction could include simple conversation or shared activities such as gaming or meals. With this feature, friends and family members can have virtually in-person interactions more frequently. Time demands that prevent these interactions are less constraining, and physical distance is irrelevant.

Operated by Natural Language & Gesture Recognition

The user can activate the system, set his or her status, call for avatars, shut down the system, and in most ways control Wall[ace]'s functions through natural language or gestural commands. This enables the user to control Wall[ace] without having to interrupt what he or she is doing and without having to memorize a series of rigid verbal system commands. If the user needs assistance remembering all of Wall[ace]'s capabilities, a graphical user interface replete with menus and lists for issuing commands and controlling user settings can be accessed at a specific location in the home.

In addition to receiving natural language and gestural commands, Wall[ace] will observe the behavior of the user and intelligently deduce needed system changes. These system changes include updating the user's avatar and closing interactions with contacts. This functionality makes Wall[ace] less disruptive to operate. To maintain the user's control, Wall[ace] projects graphical confirmation messages onto surfaces near the user to inform about the action it is about to take. The user will always have the option to accept or reject Wall[ace]'s action.

System States

Users can control how much of their network they see and how available they are to others with these four system states:

System Shut Down
User Status: Unavailable
Avatars: Not visible

The user might set Wall[ace] to this state when leaving the home or simply when solitude is desired. Now that the user's status is set to unavailable, other people in the network will not see the user's avatar in their homes. If they request to contact the user, their own Wall[ace] systems will provide auditory and visual information that the user is unavailable.

Invisible
User Status: Unavailable
Avatars: Visible

The user can see the statuses of network contacts as shown by their avatars, but the user remains inaccessible to others. As above, the user cannot be contacted. If the user contacts someone in his or her network from this state, the user's status will remain invisible to everyone besides the contacted person.

Open but "Hidden"
User Status: Available
Avatars: Not visible

The user is willing to be contacted by others in his or her network, but does not want the home environment crowded by avatars. Even so, if a network contact reaches out to the user, that contact's avatar will appear in the user's field of view on the wall and will be able to talk to the user, leave a message, or request a live conversation. The user can reach out to any of the hidden contacts by issuing a verbal command to Wall[ace], specifying who he or she wants to interact with and the type of interaction desired.

System States

Open and Active
User Status: Available
Avatars: Visible

The user is in the mood for full interaction and wants to see the avatars while being open for contact. With verbal commands, the user can reach out to any visible network contact or accept requests from contacts to interact.

The user has control at all times over how his or her avatar appears to others. Wall[ace] will accept verbal commands regarding how and where the user wants the avatar to appear. But Wall[ace] will also intelligently deduce how the user's avatar should appear based upon the user's real location and behavior. However, Wall[ace] will not act on this deduction before asking the user for confirmation in the form of a visual, graphical confirmation message that shows what the updated avatar would look like and provides buttons to accept or reject the update. The user can choose to accept or reject with a verbal command or by pressing a button. The user can set Wall[ace] to automatically update the avatar's appearance or to lock it in the form the user specifies.

The user also has control over when and if a requested interaction begins and when it should end. When the user is interacting with a contact in any capacity, he or she can verbally inform Wall[ace] when the interaction is over and needs to be closed. As with the avatar updates, Wall[ace] will also try to deduce when an interaction is over based upon verbal and gestural clues. For example, if two people say goodbye to each other and wave, Wall[ace] will assume the conversation is over but will first display a graphical confirmation message.

Implications

Wall[ace] redefines the home with a simple command, changing it from a place of separation and privacy into a social arena. With Wall[ace] activated, the feeling of being at home will be characterized by the following:

The social network will occupy the user's ambient space at home

The social network contacts within Wall[ace] are not accessed by an alphabetized list in a GUI interface. They inhabit the home around the user. As the user moves from room to room, he or she sees avatars on the walls, portraying the contact's actions. This visual will provide new prompts for interaction as people in a network will be able to relate in the dimensions of place and behavior.

User's can have a constant feeling of presence

Even when home alone, users can be surrounded by avatars representing their friends and family. This will promote a feeling of being in a crowd, potentially helping to relieve depression associated with isolation. Therefore, the system complements modern lifestyles by helping to reverse trends of community breakdown.

User's can share live experiences

User's can project their living spaces into each other's homes and have face-to-face interaction. Time limitations become less considerable and distance barriers become irrelevant as friends and family continue to see each other on a regular basis.

Evaluation & Discussion

Daren Chaisy

The most interesting thing about this project is using new projection technology and finding different ways that this technology can benefit people living in the house of the future. It's interesting to think about how projection technology can be an advancement over today's social networking/video chatting/second life technology, and thinking of ideas that help show off the technology's true power in a way that's as useful or more useful than today's interfaces of those current technologies.

If there was more time to add to our system, I think that we would discuss more about the privacy issues involved with projection technology and social networking statuses, such as allowing people out of your network to view your environment and knowing how much of your everyday life can be shown through one's avatar. We would also flesh out the different settings one can customize for their Wallace system, to deal with the privacy issues.

I see system being used in everyday situations, as well as special occasions. The system's implications are to fuse second life, online social networking, web video chatting technology into one, and to be used anywhere in the household. The system can be used to communicate with anyone you have in your social network and go about regular home activities and share that everyday experience with someone who is not at your home at that time, and can also be used for special occasions such as for holiday celebrations when some members of your family can't make it there in person, this system is the next best thing. This system can also be used to create a more personal user experience with other users of the system, such as entertainment (i.e. playing games with other people).

Craig Kochis

I thought the most interesting thing about the project was how ubiquitous the potential technologies would become. Having computers be so pervasive could be seen as useful or invasive, and addressing these issues is something that is definitely intriguing to think about in the design process.

If more time were available, I would have liked to explore ways people would interact with the system, and develop that side of the project more. There are pros and cons to voice recognition systems, and it would be interesting to see which type of system people would prefer, as well as how it would hold up across cultural differences.

I could see this system being used for people who have a desire to be more in touch with those they know or care about. One major aspect of this project is the presence of family and close friends, and how their presence is an ambient part of the home. I think this idea has a strong impact on the relationships people have, and is a way to reinforce those relationships regarding where one is located.

Jon Sandler

The most interesting thing about this class is learning how far our technology is, and slowly be design process truly learning what the implications of it are, that not even the creators thought about . Being able to envision the future is an exciting feeling because it allows us to get a sneak peak of what's to come, and it looks like it will be great. To do this and all the while gain design process experience is the definition of what interests me.

If there were more time, I think that our group would have gone more in detail with the interface and settings such as privacy and setup. We focused on how the interaction would feel, but we lacked the time to go in depth into the technical aspect which could be fully thought and drawn out with a few more weeks.

The implications of this project are huge. Not just in our group but the technology. I see the individual groups designing "apps" for the technology, each can be used in a unique way. As for the specific implications of our group's project, I believe that social networking and the way we communicate will always be evolving. Communicating started out with paintings, stories around fires, written word, and now ambient community, the next step in communication evolution. I see our project as this next step in communications evolution and it integrates next generation internet and projection technology. It might not be the last step but it looks to be an important one.

Jacob Warren

I believe this project is interesting because we live in a world in which urbanization and population growth compel us to live closer together. Ironically, our sense of community seems to diminish as this trend takes place. Can technology help facilitate a new kind of community to help reverse the breakdown of community? And if so, what would such technology look like? These are the kinds of questions I wanted to explore through design.

With more time, I would like to detail how much control users have over the settings of the system. This would be an important aspect of this design because it relates to how much privacy users have as they interact with their virtual network.

I see this technology being used to help support a wide variety of relationships, everything from casual friendships to geographically distant family members. This means that users will be able to have face-to-face dialogs with people in their community, regardless of distance.

Leslie Ferguson

The most interesting part of this project is how it can transform the atmosphere of a home and the feelings of those who occupy it. The ability to feel completely social when you are technically alone is an amazing concept. In addition, the ability to provide these effects and still provide people with a feeling of control and security was an important challenge. The realization of the "home of the future" is undoubtedly coming, and what was fun about this project was being able to image how *we* would like it to act and feel.

With the time constraints of this project the design process was greatly condensed and many details of the final design were left undone. For example, outside of casual conversations, we were unable to test our ideas with a user population. Without this, it is unknown whether or not things in our design that seemed natural and comfortable to our team feel the same to our target user population. Furthermore, the details of managing your social network within this system were almost completely ignored for the sake of time. These sacrifices helped us to complete a solid foundation of the idea in the allotted time; however, with more time they would have been important avenues to pursue.

Wall[ace] has the ability to transform how relationships are formed and maintained. No longer are interactions limited by location or keyboard and mouse. By allowing live interaction in a way that is not currently possible, this system puts the power in it's users hands by giving them the freedom to choose how they will interact with each other. Furthermore, by allowing people to feel the presence of their community, this system transforms how it feels to be home alone. This has great implications with respect to the problems of loneliness that are often experienced by people feeling lost in large cities or the elderly who have trouble leaving their home. Finally, by using the avatar medium as a starting point for communication, a person's privacy and anonymity is in their control. Privacy was a major concern from the beginning of our design process. By using the avatars as a medium, people will feel more at ease and the system will be more inclusive to people with all levels of comfort with this type of interaction.

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