

Ambient and Social TV: A Conceptual Design that Connects Everyday Life in a Sporadic Community

K. Chorianopoulos

Department of Architecture
Bauhaus University of Weimar, Germany
k.chorianopoulos@archit.uni-weimar.de

Keywords: Locative media, ambient TV, social TV, shared experience, presence, awareness.

Abstract

In this research program, we explore the relationship between television use, architectural space, and community identity. In particular, we discuss the conceptual design of a system that brings together the physically distributed academic community (students, academic and administrative staff) of the University of the Aegean. We propose the employment of networked interactive video installations in everyday places (e.g. cafeteria, halls) of the university. In this paper, we explore previous related research and we discuss design issues and approaches for the case of the University of the Aegean.

1 Introduction

Situated technologies offer new ways of combining the emerging ubiquitous nature of digital technologies with the significant qualities of physical environments. Ambient Intelligence (AmI) holds the potential to facilitate, encourage, and enrich social interaction. Like dwellings or fireplaces, situated technologies can promote social interaction and become a placeholder for shared experiences. In this work, we examine whether and how the shared experience of TV could be extended with networked audiovisual content that connects everyday life across physically distributed communities.

The motivation for this work is based on previous findings about the sociological effects of TV use (Kubey and Csikszentmihalyi 1990). Despite the criticism concerning the value of TV, there are studies that reveal several worthwhile aspects, such as social communication. Indeed, TV content is used as a placeholder for interpersonal and group communication. This type of social communication around TV happens within co-located or distant groups of people. In addition, it takes place either in public or private space. Then, a significant research field is the study and design of ambient TV systems that facilitate and promote social communication in domestic or outdoor environments.

The use of interactive TV as a social glue is explored in a case study of a distance community. The University of the Aegean is a unique academic institute, which is spread of five islands in the Aegean archipelago (Abrahams 2007). Although the distance between the islands is not big in terms of kilometers, it is very big in terms of time, effort and cost in order to reach by frequent public transportation. As a matter of fact, there is minimum of academic life co-ordination between the different schools. In this context, we investigate the design and evaluation of Ambient Intelligence (AmI) tools that connect everyday life activities between the different islands of the University of the Aegean.

2 Related work

Although TV is implicitly assumed as a domestic technology, there are also several uses of TV in public space (McCarthy 2001). Furthermore, the integration of powerful communication mediums, such as TV, in the fabric of the social and build space is of central importance to the future of human-computer interaction (Dourish 2002).

There have been several artistic works that explored the connectedness of places. Hole-In-Space was a Public Communication Sculpture. It connected an art exhibition center in New York City with a department store located in an open-air mall at the west coast. The visitors of the two places had a surprising encounter with each other. The audiovisual link provided life-sized, television images of the people on the opposite coast. They could now see, hear, and speak with each other as if encountering each other on the same sidewalk. No signs, sponsor logos, or credits were posted –no explanation at all was offered. No self-view video monitors to distract from the phenomena of this life-size encounter (Galloway and Rabinowitz 1980). Besides the innovative Hole-in-Space, there has been an installation at a mall that employed rich audiovisual media, TV screens and sensors (McCarthy 2001).

Despite the many criticisms on the quality of TV content and on the passive nature of the watching activity, the social uses of TV have been documented in acclaimed

research (Gauntlett and Hill 1999, Kubey and Csikszentmihalyi 1990).

Karahalios and Donath (2004) have explored residential video use in the dormitories at MIT. Having connected two public locations in dormitories, they proceeded to experiment with various visual effects that help the technology serve as a social catalyst for interaction. They focused on optimizing the technology to promote spontaneous interactions.

Previous research in ambient intelligence has considered computing applications that are integrated with the physical environment (e.g. sensors, public displays), or mobile applications. In these cases, the main requirement for the design of the user interface is the automation of computing tasks and the minimal user intervention, which are based on detailed user models, sensors and context adaptation (Schmidt 2000). In addition, the focus of previous work in social research, such as the cooperative buildings conference, was on the organizational aspects of collaborative work (Streitz et al. 1998).

Open research questions

Artistic works and video-art installations have introduced innovative systems to the general public. Artists have been employing distance communication systems for a long time, but they have never been interested in measuring the effects or the reactions of the people involved in their works. They are interested in creating involvement and reaction without considering the nature or the size of these effects. Yet, ideas pioneered by artists and made possible by ubiquitous computing could be appropriated and exploited to the direction of augmenting social communication in everyday places.

Previous works in Computer Supported Cooperative Work (CSCW) have been installed in researchers' office and have been used to link distant offices of the same organization. Notable examples include innovative work performed at Xerox PARC, which was followed up by MIT Media Lab and Georgia Institute of Technology. These works have been focused in the work environment. Moreover, there are no systems that connect more than two locations at the same time and it is unlikely that the findings could scale very well.

Media researchers have studied the interaction between electronic media and humans, while architects have studied the interaction between humans and the build environment. What happens and how do these disciplines complement each other, when digital media become an integral part of everyday (home and city) life? Of particular interest is the use of interactive public displays in the city (Struppek 2006) and the interplay between the large displays and mobile end-user terminals. In this context, interesting research issues include the use of Ambient ITV systems to enhance awareness and human connectedness in public and domestic spaces.

Approach

The majority of previous research on interactive TV has over-emphasized the benefit of increased choice of content and of the interactivity. Instead, a worthwhile effort would be the fulfilment of seamless communication over, or about televised content. Such services could support human connectedness (Agamanolis 2006) over a distance (e.g. synchronous communication over a TV program between diasporic households), or enhancement of the shared experience that comes with TV co-viewing (e.g. asynchronous messaging and discussion about a TV program). For this reason, we propose an integrated view of the interpersonal communication together with the shared experience of mass communication.

Besides the role of TV as a communication medium, there is also a potential to exploit the familiarity of most people with TV as an interface to rich audiovisual information about people, places and events. Indeed, TV use does not require high skill or effort, which is ideal as a paradigm of use for ambient user interfaces. In this work, seamless access to situated computing is modelled after the use of TV in everyday life. Instead of considering TV only as a content medium and the focus of user activity, an alternative approach is to consider TV as a secondary function to other activities, such as socializing, leisure pursuits.

We plan to design and develop an Ambient and Social TV platform (hardware, software, physical installation, audiovisual content) that supports social communication in a positive way, with regard to the above research questions. Moreover, we plan to systematically evaluate both the technical and the social aspects of the prototype with real users along a feasible span of time (Ball-Rokeach et al. 2001). For this purpose, there should be a case study for a sporadic community that would need and welcome the installation of such a system. The ideal sporadic community would be an organization that is distributed and that has many social activities that matter as much as the main organizational goals described in the mission statement.

3 The case of the University of the Aegean

"No university is an island, and even universities situated on islands need to bear this in mind."

EUA

The University of the Aegean (<http://www.aegean.gr>) is distributed over five islands that belong to different clusters of islands in the Aegean archipelago. The five islands that host the five schools of the UniAegean are Chios, Mytilini, Rhodes, Samos, and Syros. This is a very unique situation when compared to other academic institutes that might have multiple remote campuses. Although the distance between the islands is not big in terms of kilometers, it is very big in terms of time, effort and cost to reach by frequent public transportation (Abrahams 2007). As a matter of fact, there is a

requirement for extra effort in order to achieve communication between the different schools. The distance between the islands and the respective schools could be regarded as disciplinary and identity distance.

The main motivation for distributing the schools of the university over different islands was to support local development and avoid the shrinkage of the population on the islands, which is a very worthwhile objective in Greece, where half the population lives and works (at least during the winter) in the greater Athens area. On the other hand, the distance between the islands has balkanised the student life of the university and created five different university identities. Could communication and situated technologies together with interaction design provide means of bridging the distance between the islands?

A distance communication system has been developed to connect primary education schools over five islands in Sweden (Groth et al. 2005). That system is targeted to teachers and is based on direct interaction with Table PC devices.

We propose the design of simple tools that connect academic life activities between the different islands of the University of the Aegean. A distance communication system could be installed in the architectural space at different sites of the University of the Aegean, and replace the missing awareness links between the members of the academic community or augment the need for remote presence in new ways.

MyAegean: An online community

Notably, the lack of a common academic awareness has been noticed by a pro-active group of students, who have set-up a community web portal, called MyAegean (<http://my.aegean.gr>). The portal provides several sections such as articles, forums, and gallery and it is popular among current and former students. We propose the extension of the digital community of the University of the Aegean into the physical space, by the means of interactive video installations in everyday places (e.g. cafeteria, halls) of the university, which present feeds and snapshots from the portal's content. In addition, we briefly present a scenario for simple awareness application.

WeAegean: A seamless distance communication video installation

The system that connects remote social places of the academic community could be based on Ambient TV screens installed at common places. The TV screen could be controlled by multimedia and networked computers. Input devices could include microphones, cameras, as well as other types of sensors. The software of the system should be web-based in order to allow straightforward interfacing with existing and emerging applications. In the pilot phase, a series of simple applications demonstrate the system and are used to evaluate it: 1) rolling dices, 2) interface with the existing digital community MyAegean. Further applications could be made possible by providing

a simple web-authoring interface that could turn most academic members into producers of this community TV station.

MyAegean interface

The most straightforward way to populate with content a close circuit TV system would be to harvest related online resources and present them in a carousel. Then, the digital community of the University of Aegean could be directly extended into the physical space by interfaces that connect the two systems. The MyAegean portal provides a placeholder for sustaining social communication. Nevertheless, the MyAegean system does not have direct and real-time input from the events in the physical space. For this purpose, we intend on building several sensor-based (e.g. microphone, camera) interfaces and applications that connect the distance places and could in turn provide information back to the online community. In many cases, the MyAegean content could remain on the screen or being part of a loop. The rolling dices application, which is described next, runs in parallel with the MyAegean carousel.

Rolling dices

Attending social places in universities in Greece is usually connected with cold coffee ('frappe') drinking and lots of hours spend playing backgammon. Especially during the relaxed periods at the beginning of the semesters the dices are rolling and create lots of noise, or for some the sound of "lightness of being". What if this atmosphere could be transmitted to the rest of the parts of this distributed cafeteria? The "Rolling dices" application listens to local activity and depending on the degree of backgammon playing it will display rolling dices in remote screens, which are seamlessly overlaid to current content feeds.

Some technical aspects

In this section, we outline the technological infrastructure necessary to support this project. In terms of bandwidth, there is need for a multicast network that streams at least one TV channel in real-time to multiple remote locations. Other technical capabilities include the use of multimedia computers with hardware-level MPEG decoders and powerful graphics that allow real-time rendering of video and dynamic graphics.

In terms of interaction design, the use of TV terminals is expected to offer an established and familiar mode of communication. In terms of technical requirements, TV terminals could be replaced by computer monitors, but the use of TV terminals implies a more relaxed, lean-back and ambient mode of interactivity with groups of collocated or distant users. Moreover, at the content level a TV-like content carousel is easier to manage for the content editors.

The exact effects that this system will bring to social communication of the community is not possible to determine. Assuming that the system will be adopted by

the majority of the community members, it is foreseen that the positive effects of TV watching (e.g. shared experience) could be replicated.

User evaluation methodology

The methodology employs a broad set of elements from many disciplines. The overall approach is user centered, where the user is regarded to have many roles such as casual passer-by, author of content, or stakeholder at an organization. The system design, development and integration phase will take place during the first part of the project. The focus will be on involving a panel of users and stakeholders from the University, creating enthusiasm, and gathering user requirements for the technical solution that follows. Next, the system development will be based on integration and adaptation of existing components from related research efforts.

The main aim of the project is to systematically evaluate the social aspects of the prototype with casual users with a longitudinal toolset. Potential data collection instrument include data logging in computers, diaries and questionnaires filled-in by a panel of users, ethnographic observations at the installation sites, interviews. For example, questionnaires and interviews could be employed during the life-time of the project in order to determine shifts in the reported community awareness. Moreover, objective instruments such as data logs and object tracking in video feeds will be employed to assess the participation of users in the uploading of content and in gathering around the system places respectively. The data collection and analysis will be performed continuously, in order to record the temporal effects on the community of the University.

4 Discussion

The connectivity of communities can be reinforced through new situated computing technologies, which lend themselves to shared experiences, such as content sharing and collaborative interaction. For example, public displays in the city enable interplay between large-scale shared displays and small-scale personal mobile terminals. These media offer a different model of sharing, individual and collaborative experience, as well as public reception of place-based media content. Therefore, we aim to explore how situated technologies enable new forms of social practice and contribute towards enhancing and perhaps expanding social encounters in everyday places, such as the streets, parks, cafes, malls, etc.

Acknowledgements

This work is supported by the MEDIACITY project (<http://www.mediacity-project.org>), which is sponsored by the European Commission Marie Curie Host Fellowships for Transfer of Knowledge (MTKD-CT-2004-517121) at. In addition, special acknowledgements go to the online (and off-line) community of the students of the University of the Aegean (<http://my.aegean.gr>).

References

- [1] Abrahams, M. Far fetched: Reaching out to students over seas, *Guardian Education*, Tuesday January 16, 2007.
- [2] Agamanolis, S. At the intersection of broadband and broadcasting: How ITV technologies can support Human Connectedness, *Proceedings of the 4th European Interactive TV Conference*, 2006.
- [3] Ball-Rokeach, S. J., Kim, Y., & Matei, S. (2001). *Storytelling neighborhood: Paths to belonging in diverse urban environments*. *Communication Research*, 28 (4), 392-428.
- [4] Dourish, P. *Where the Action Is: Foundations of Embodied Interaction*. MIT Press, 2002.
- [5] EUA, European University Association, Institutional Evaluation Programme at the University of the Aegean, December 2005, Accessed on March 25, 2007, <http://tinyurl.com/3c7fzd>
- [6] Galloway, K. and Rabinowitz, S. *Hole-In-Space*. <http://www.ecafe.com/getty/HIS/>.
- [7] Gauntlett, D. and Hill, A. *TV Living: Television, Culture and Everyday Life*. Routledge, 1999.
- [8] Groth, K., Bogdan, C., Lindquist, S., Räsänen, M., Sandor, O., and Lidskog, T. 2005. Creating a space for increased community feeling among geographically distributed teachers. In *Proceedings of the 4th Decennial Conference on Critical Computing: between Sense and Sensibility*. CC '05. ACM Press, New York, 145-148.
- [9] Karahalios, K. and Donath, J. *Telemurals: linking remote spaces with social catalysts*. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, CHI '04. ACM Press, New York, NY, 615-622, 2004.
- [10] Kubey, R. and Csikszentmihalyi, M. *Television and the Quality of Life: How Viewing Shapes Everyday Experiences*. Lawrence Erlbaum, 1990.
- [11] McCarthy, A. *Ambient Television: Visual Culture and Public Space*. Duke University Press, 2001.
- [12] McCollough, M. *Digital Ground: Architecture, Pervasive Computing, and Environmental Knowing*. MIT Press, 2004
- [13] Oehlberg, L., N. Ducheneaut, J. D. Thornton, R. J. Moore, E. Nickell. *Social TV: Designing for Distributed, Sociable Television Viewing*, In *Proceedings of the 4th European Interactive TV conference*. 2006.
- [14] Putnam, R. *Bowling Alone: The Collapse and Revival of American Community*. Simon & Schuster, 2001.
- [15] Schmidt, A. *Implicit Human Computer Interaction Through Context*. *Personal Technologies*, 4(2), 2000.
- [16] Streitz, N.A., J Gei ler, T. Holmer. *Roomware for Cooperative Buildings: Integrated Design of Architectural Spaces and Information Spaces*, *Lecture Notes in Computer Science*, Volume 1370, 1998
- [17] Struppek, M, *The social potential of Urban Screen*. *Visual Communication*, 5(2), pp. 173-188, Sage, 2006