

Ambient Agoras – InfoRiver, SIAM, Hello.Wall

Thorsten Prante, Richard Stenzel, Carsten Röcker, Norbert Streit, Carsten Magerkurth

Fraunhofer IPSI, AMBIENTE – Smart Environments of the Future
Dolivostraße 15, D-64293 Darmstadt, Germany
{prante; stenzel; roecker; streitz; magerkurth}@ipsi.fraunhofer.de

ABSTRACT

This demonstration reports results from the EU-funded project Ambient Agoras, investigating future applications of ubiquitous and ambient computing in workspaces. Instead of presenting underlying system technologies or evaluation findings, this demonstration will focus on three running prototypes that emerged from the project: InfoRiver, SIAM, and Hello.Wall. The systems are meant to support work-related processes in office buildings while at the same time fostering informal communication. The *InfoRiver* implements the information river metaphor for information flow through a building or an organization. *SIAM* is a task-management system enriched with collaboration support to foster group communication and awareness. *Hello.Wall* is a new ambient display that can “borrow” mobile artefacts. All prototypes are multi-user and multi-device systems enabling coherent and engaging interaction experiences with a variety of sensor-enhanced smart artefacts.

Categories and Subject Descriptors:

B.4.2 [Input/Output and Data Communications]: Input/Output Devices; H.5.2 [Information Interfaces and Presentation]: User Interfaces — Interaction Styles; H.5.3 [Information Interfaces and Presentation]: Group and Organization Interfaces; H.3.4 [Information Storage and Retrieval]: Systems and Software — Current Awareness Systems; H.4.3 [Information System Applications]: Communications Applications — Bulletin Boards

Keywords:

Ubiquitous computing, interaction design, smart artefacts, communication support, ambient displays, informative art, zones of interaction, borrowed display

INFORIVER

The InfoRiver system implementing the information river metaphor is meant to support and foster the flow of information through an office building or an organization, e.g., company-related news and announcements or messages. This requires, on the one hand, providing tailored user interfaces for a variety of artefacts and, on the other hand, supporting convenient content generation to determine, among other things, expiration date and recipients of the information. The implemented application scenario for the

InfoRiver is a “marketplace” of skills and projects where people can offer their competencies and project managers can search for people and offer their projects. The prototype supports a standard PC user interface for item generation and four user interfaces tailored to support different interactions with information items at the InforMall, ConsulTable, ViewPort, and GossiPlace artefacts. The InforMall is a vertical large interactive display meant to attract user attention at frequented places while the GossiPlace notifies users passing by. The ViewPort is a wavelan-equipped PDA-like computer to create and host personal information selections. Finally, the ConsulTable presents a stand-up interactive table supporting face-to-face discussions. To ensure that the artefacts smoothly work together, they are provided with integrated sensor technology.



Figure 1. User Interfaces to the InfoRiver system – clockwise from upper left: InforMall, GossiPlace & ViewPort, ConsulTable

Items floating in the InfoRiver can be accessed at the InforMall. The items’ content is only shown when dragging them out of the river to the “beach”. Items can further be dragged to a ViewPort or vice versa. The ViewPort user interface serves as an interface to personal collections of InfoRiver items – people pick up personal favorites for further processing at a different location. The InforMall comprises a sensor-enhanced user interface (Bridge) to enable information exchange with ViewPorts. Users passing by the GossiPlace are sensed and can be notified about interesting messages by a color change in its display. The contents of messages can be viewed using a ViewPort. The Consul-Table user interface provides support for discussions about information river items. Again, items can be exchanged between ViewPorts and the ConsulTable via a Bridge interface. On the interactive tabletop, items can be annotated and rotated.

SIAM

SIAM is a lightweight task-management system. Moreover, it is meant to foster group communication and to provide awareness of what other people are doing. Tasks are not only descriptions of what has to be done or what was done, but are also conversational items and subject to collaboration. Thus, task management in small co-located teams is not only about structuring, assigning, processing, and documenting progress in task processing, but also benefits from the integration of collaboration support and from presenting common task items in a way that aids conversation about them. Support for awareness about who is doing what becomes crucial in a team where members have only a relatively small amount of overlapping presence at the office. SIAM focuses on a collaboration infrastructure and user interface to manage tasks, where every object can be synchronously shared and every change is immediately visualized at all machines. SIAM has a very simple and yet powerful black board user interface including task items, directed links, and means to grant access rights on a higher level than task items. Each task item can be pinned on multiple boards at once, where all appearances are synchronously updated and thereby, e.g., undiscovered at the same time upon completion. Each task item has a complete interaction history for comprehension and to prevent misuse of the system. Each user has a personal history to be able to track her achievements. This can also be a list of all completed, currently processed and planned tasks. The system runs on standard PCs to have it accessible at the personal workplace where most of the task processing and documenting is done. Moreover, it runs at the InforMall for public awareness and at the ConsulTable to support two to three people in reflecting about and planning of tasks as well as in joint task processing. To further support fluent collaboration, RFID-based multi-user login is facilitated at both the InforMall and the ConsulTable. This enables fast personalized access to task boards via pop-up menus on the respective personal icon. Finally, a second version of the GossiPlace has been used to notify users about new tasks, which was especially appreciated (fig. 1).

HELLO.WALL

The *Hello.Wall* is a new wall-sized ambient display [1,4] that emits information via light patterns and is considered informative art (see fig. 2).



Figure 2. Interaction at the Hello.Wall using a second generation ViewPort as a „borrowed display“

Using large public displays as notification and awareness systems can be annoying and inappropriate. Therefore, we

set out to design a piece of calm technology [3] which unobtrusively serves an informative role to the initiated members of an organization or a place, whereas visitors might consider it only as an atmospheric decorative element and enjoy its aesthetic quality. In order to communicate more detailed and personal information, the system can *borrow* mobile artifacts, in this case our 2nd generation *ViewPorts*. The system realizes three *zones of interaction* to define "distance-dependent semantics", meaning that the distance of an individual from the wall defines the interactions offered and the kind of information shown on the Hello.Wall and the ViewPort. When people are outside the range of the wall's sensors, i.e. in the *ambient zone*, the display shows general information that is defined to be shown independent of the presence of a particular person. Once a person and its personalized ViewPort are detected in the *notification zone*, depending on the kind of application, data can be transmitted to the ViewPort and/or distinctive light patterns can be displayed for notification. These can be personal patterns known only to a particular person, group patterns, or generally known patterns. Within the *cell interaction zone*, people that are very close to the Hello.Wall can interact with each single cell or several cells at once using a ViewPort to read the cells' IDs. Simultaneous interaction using several ViewPorts at a Hello.Wall is supported as well. These features allow playful and narrative interactions and there is also a charming element of surprise that may be discovered via single cell interaction.

RELATED WORK

This work is a foray into the emerging domain of ambient intelligence. It builds upon our previous work on interweaving information technology with architectural spaces [2]. There is not enough space here to do justice to all the work that influenced our research. We just mention [3, 4].

ACKNOWLEDGMENTS

This work is supported by the European Commission (IST–2000-25134) within the Disappearing Computer initiative (www.ambient-agoras.org). Special thanks are due to our project partners at EDF and Wilkhahn as well as to Daniel van Alphen, Daniela Plewe, and Stefan Zink.

REFERENCES

1. Prante, T. et al. Hello.Wall - Beyond Ambient Displays. *Adjunct Proceedings of UbiComp 2003*, 277-278.
2. Streitz, N. et al. Roomware: Towards the Next Generation of Human-Computer Interaction based on an Integrated Design of Real and Virtual Worlds. In: *J. Carroll (Ed.): Human-Computer Interaction in the New Millennium*, Addison-Wesley, 2001, 553-578.
3. Weiser, M., Brown, J. S. Designing calm technology. *PowerGrid Journal*, Vol. 1, No. 1, 1996.
4. Wisneski, C. et al. Ambient displays: Turning architectural space into an interface between people and digital information. *Proc. of CoBuild '98*, 22-32.