UbiComp 2006 Workshops, Part 2

John Krumm and Ken Anderson

EDITORS’ INTRODUCTION

This is the second part of the workshop summaries from the 8th International Conference on Ubiquitous Computing. The first part appeared in the Jan.–Mar. issue. We asked each workshop’s organizers to highlight the more interesting and unexpected parts of their workshops.

—John Krumm and Ken Anderson

SYSTEM SUPPORT FOR UBQUITOUS COMPUTING

Rodger Lea and Michael Blackstock, University of British Columbia

This year’s UbiSys workshop focused on four interrelated themes: common abstractions, new and emerging middleware and software engineering approaches, widescale interdomain deployment, and techniques and benchmarks for effective evaluation of ubicomp systems.

Owing to the workshop’s large size (47 participants), the day started with a “one-minute madness” where each participant had a minute to state his or her position on these issues. It then continued with a mix of two paper sessions and three panel discussions.

During the discussions, several key issues emerged. One subject of lively debate was the possibility of a common set of ubicomp abstractions and of the community adopting a toolkit or platform to facilitate research. Many felt this would help address a second issue that participants frequently raised—namely, evaluation and benchmarking of ubicomp systems research. A key aspect of this issue, described as “magic in ubicomp systems,” was that many researchers failed to adequately explain their assumptions and relied on some future “magic” to help justify their approach.

An equally important issue was the community’s poor record in addressing resilience and reliability. Many participants perceived this problem as a stumbling block to real-world deployment of ubicomp technologies. As an antidote to this problem, many participants agreed with the suggestion that ubisys researchers should increasingly strive to reuse their own work and reduce reinvention and replication within the community.

The metatheme that evolved during the day was the need for better coordination among the community. This theme was particularly evident in the last panel, which focused on common scenarios to aid evaluation and on the need to develop a community-supported set of grand challenges.

More details, including an online paper archive, are at www.magic.ubc.ca/ubisys.

PERSVATIVE IMAGE CAPTURE AND SHARING

Mirjana Spasojevic, Nokia Research Center
Mizuko Ito, University of Southern California
Nancy Van House, University of California, Berkeley
Ilpo Koskinen, University of Art and Design, Helsinki
Fumitoshi Kato, Keio University

The second Pervasive Image Capture and Sharing: New Social Practices and Implications for Technology workshop brought together a diverse, multidisciplinary group of researchers. Our goals were to examine new technical developments and social practices and their implications for further research.

During the opening presentations, the participants shared their research covering new applications and services for capturing images and context, augmenting the images and context with sound or text, and sharing them via the Web or in printed form. We also learned about new practices in certain countries, such as Japanese teenage girls’ use of Purikura (printed sticker pictures).

Most of the day involved field and design exercises. We used the ZoneTag camera phone application, which automatically tags photos with the time and location and uploads them to Flickr, a photo-sharing Web site. In addition, users can add tags that ZoneTag suggests or that they create. The field exercise aimed...
to stimulate ideas and thinking from users’ viewpoints by capturing photos in a realistic context. Small teams walked around Fashion Island, a nearby shopping mall, pretending to be one of the suggested personas, capturing and uploading photos. The persona descriptions provided details of several fictional individuals including their occupations (for example, office worker, student, or marketing executive), family status, hobbies (for example, cooking, skydiving, and traveling), and currently owned phones and typical use patterns. The design exercise involved brainstorming new ways of capturing and sharing these images. Several interesting ideas emerged, including a proposal to “hijack” satellite images and an application for consulting friends and family regarding shopping decisions.

Our wrap-up discussion revisited a number of open questions, such as how to provide the most compelling image-sharing experience, whether image sharing and social software will converge, and how to anticipate developments in this domain. Much of the debate focused on privacy issues, such as inadvertent disclosure of your whereabouts or activities, the many uncertainties regarding this personal information freely traveling through the network, and the ultimate questions of who would care about these “Big Brother” effects, and why.

**USABLE UBQUITOUS COMPUTING IN NEXT-GENERATION CONFERENCE ROOMS**

Maribeth Back, FX Palo Alto Laboratory
Masatomi Inagaki and Kazunori Horikiri, Fuji Xerox
Saadi Lahlou, EDF R&D and CNRS-EHESS
Rafael (Tico) Ballagas, RWTH Aachen University
Jeffrey Huang, Swiss Federal Institute of Technology Lausanne
Surapong Lertsithichai, Silpakom University

In our second workshop on applied ubicomp in conference room settings, participants came from 10 countries in Europe, Asia, and the Americas and from both industry and academia. From our first workshop (in 2005) we had learned that usability is a primary challenge in cutting-edge meeting spaces. Although smart rooms often have interesting and effective functionality, they’re seldom designed with usability in mind. Their systems are designed for and assume the presence of human “wizards,” resident experts who keep them functioning. By focusing on usability, we aimed to discern some cross-cultural commonalities and discover differences in how people use conference room technology. We also looked at new technologies being developed for conference rooms and tried to understand how (and whether) the design intent was informed by usability studies.

Recurring themes in the day’s presentations and discussions included:

- Integrated document and metadata systems that support different types of sessions, security, privacy, and easy document handling and sharing.
- Interoperability between different systems in widely distributed places.
- Methods for understanding context and agenda. This involves both micro-agendas—what each person brings into the room—and macro-agendas—not only the meeting’s overt substance but also the context in which the meeting occurs: company directions, corporate culture, and business climate.
- Furniture and environmental design: furniture and architecture with integrated electronics, and room-based sensor systems that provide lightweight, easy-to-use interaction with mobile devices (including laptops).

Although meeting-room technology has been an active research topic for decades, the community remains vital. The conversations and presentations engaged people deeply, leading us to continue our interaction beyond the workshop’s scope: not only through online document sharing but also by creating links between the smart spaces that many of us have built. As yet, there’s no technology standard for next-generation conference rooms. By linking together disparate sites, we might discover commonalities in practice that point us in the right direction for standards creation.

**NURTURING TECHNOLOGIES IN THE DOMESTIC ENVIRONMENT**

Ame Elliott, Palo Alto Research Center
Scott D. Mainwaring and Allison Woodruff, Intel Research
Phoebe Sengers, Cornell University

Participants kicked off the workshop by sharing descriptions and images of a nurturing place from their own experience. Even though the examples came from different social contexts (rural Southern US, India, Singapore, Jamaica, and so on), a common theme was the importance of mysterious or secret places. One such example was a shed hidden behind a house that opened to reveal a light, airy sanctuary where young men learned woodworking and socialized without much talking.

Using these personal examples as inspiration, small teams of participants sketched storyboards illustrating ways of interacting with nurturing technology. One example was an audio channel that let kids in a tent in a suburban backyard listen in on the adults’ chatter inside the house if their imaginations ran away with them and they became scared. As each team presented its storyboard, people individually recorded key ideas on
stickies. After open-ended discussions, we formed new teams that merged the collections of sticky notes into a group affinity diagram. Negotiating boundaries, especially between parents and children as in the tent example, emerged as one of the strongest themes across groups. Other themes included ways of being alone together, environments that support playful exploration, and physical expressions of transition.

The 20 participants’ diverse backgrounds—computer scientists, anthropologists, designers, and psychologists, from industry and academia—contributed to lively discussions. Although the participants specialized in a broad range of technologies (for example, videogames and home automation) and application domains (for example, healthcare, home entertainment, and spiritual practices), enough common ground existed for a cross-fertilization of ideas.

UBIHEALTH
Thomas Riisgaard Hansen, University of Aarhus
Jakob E. Bardram, IT University of Copenhagen
Ilkka Korhonen, VTT Technical Research Centre of Finland

This was the fourth UbiHealth workshop in conjunction with UbiComp; its main goal was to provide an overview of the state of the art of pervasive and ubiquitous computing in healthcare. Healthcare and ubiquitous computing fit together in the sense that healthcare involves collaborating in the physical world, moving around, working in a special environment, using many different systems, and relying on systems that are tailored to the task at hand. Ubiquitous computing can potentially address some of these issues. However, combining advanced technology with a complex work setting in a safety-critical environment isn’t easy, and some of the workshop’s recurring themes addressed this problem.

One very practical topic was the ease of doing research in an actual health facility. Many participants had very different experiences in dealing with hospital review boards. One researcher had to wait more than 18 months for approval to shadow nurses. Others knew clever tricks to get the approval more smoothly—for example, by directly involving clinicians in the research team.

Another hot topic was the use of sen-

John Krumm is a researcher at Microsoft Research. Contact him at jckrumm@microsoft.com.

Ken Anderson is an anthropologist and manages the People and Practices Research Group at Intel Research. Contact him at ken.anderson@intel.com.

Rodger Lea is an adjunct professor with the University of British Columbia’s Media and Graphics Interdisciplinary Centre. Contact him at rodgerl@ece.ubc.ca.

Michael Blackstock is a computer science PhD student at the University of British Columbia. Contact him at michael@cs.ubc.ca.

Mirjana Spasojevic is a senior principal scientist at the Nokia Research Center in Palo Alto, California. Contact her at mirjana.spasojevic@nokia.com.

Mizuko Ito is a research scientist at the University of Southern California’s Annenberg Center for Communication. Contact her at mito@ltfisher.com.

Nancy Van House is a professor in the School of Information at the University of California, Berkeley. Contact her at vanhouse@sims.berkeley.edu.

Ilpo Koskinen is a professor of industrial design at the University of Art and Design, Helsinki. Contact him at ikoskine@uiah.fi.

Fumitoshi Kato is an associate professor in Keio University’s Faculty of Environmental Information. Contact him at fk@fsc.keio.ac.jp.

Maribeth Back is a senior research scientist at FX Palo Alto Laboratory. Contact her at back@fxpal.com.

Masatomi Inagaki is a corporate technology planner at Fuji Xerox. Contact him at masatomi.inagaki@fujixerox.co.jp.

Kazunori Horikiri is an engineer at Fuji Xerox. Contact him at kazunori.horikiri@fujixerox.co.jp.

Saadi Lahlou is the director of the Laboratory for Design for Cognition at EDF R&D. Contact him at saadi.lahlou@gmail.com.

Rafael (Tico) Ballagas is a doctoral candidate at RWTH Aachen University. Contact him at ballagas@cs.rwth-aachen.de.

Jeffrey Huang is the director of the Media and Design Laboratory at the Swiss Federal Institute of Technology Lausanne (EPFL). Contact him at jeffrey.huang@epfl.ch.

Surapong Lertsithichai is an associate professor at Silpakorn University. Contact him at benlerti@hotmail.com.

Ame Elliott is a research scientist at the Palo Alto Research Center. Contact her at aelliott@parc.com.

Scott D. Mainwaring is a senior researcher at Intel Research. Contact him at scott.mainwaring@intel.com.

Allison Woodruff is a researcher at Intel Research. Contact her at allison.woodruff@intel.com.

Phoebe Sengers is an assistant professor of Information Science and Science & Technology Studies at Cornell University. Contact her at sengers@cs.cornell.edu.

Thomas Riisgaard Hansen has a postdoctoral position at the University of Aarhus. Contact him at thomasr@daimi.au.dk.

Jakob E. Bardram is a professor at the IT University of Copenhagen. Contact him at bardram@it.edu.

Ilkka Korhonen is a docent and team leader at the VTT Technical Research Centre of Finland. Contact him at ilkka.korhonen@vtt.fi.
sors in healthcare, which proved to be both technically challenging and challenging for these systems’ end users.

At a breakout session, one group focused directly on human factors in healthcare systems, and the outcome was the manifesto, “Ten Commandments for Human Factors in UbiHealth—For Mental, Social and Physical Wellness.” For example, the sixth commandment was, “Thou shalt incorporate exception handling, creating fail-safe, fail-soft systems and backup systems incorporating hazard/risk management for Food and Drug Administration compliance.”

Overall, the workshop’s most interesting part was hearing how people addressed related problems. Each research group had different approaches. For instance, when designing sensors to detect falls, should you use cameras, accelerometers, or another type of sensor? Can you actually detect that people are about to fall and take preventive measures?

Workshop slides and notes are available at www.healthcare.pervasive.dk/UbiHealth2006.