Remix rooms: Redefining the smart conference room

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ABSTRACT
In this workshop we will explore how the experience of smart conference rooms can be broadened to include different contexts and media such as context-aware mobile systems, personal and professional videoconferencing, virtual worlds, and social software. How should the technologies behind conference room systems reflect the rapidly changing expectations around personal devices and social online spaces like Facebook, Twitter, and Second Life? What kinds of systems are needed to support meetings in technologically complex environments? How can a mashup of conference room spaces and technologies account for differing social and cultural practices around meetings? What requirements are imposed by security and privacy issues in public and semi-public spaces?

Author Keywords
Virtual reality, mobile media, collaboration, smart rooms, augmented environments, meeting practices, ubiquitous displays

ACM Classification Keywords
H5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

INTRODUCTION
Meeting room research has been and remains a focal point for some of the most interesting and applied work in CSCW. What lessons can we take from the research to date as we move forward? We are confident that a lively and useful discussion will be engendered by bringing directions from recent research in videoconferencing, virtual worlds, mobile multimedia applications, and social software to ongoing research in conference rooms systems. The challenge here is to strike an effective balance between media in mashups of new kinds of functionality (such as multiple displays, new video and virtual space interfaces, mobile media systems, new uploading/access/security systems, to name just a few areas of interest). Therefore, we propose a workshop to focus more specifically on how the design of meeting systems can support the mashup of diverse media. In particular, how do we enable easy and effective crossover between media like virtual worlds, videoconference systems, and mobile applications? What's useful in applying mashup techniques in the context of a meeting or classroom, with multiple streams of input from a many devices and systems? And what kind of displays and system management tools are needed in a "Remix Room?"

Figure 1. A meeting participant communicating with avatars in a virtual space via mobile chat.

This workshop grows out of a series of workshops at UbiComp for a community of people interested in the changing uses and technologies of "smart" meeting rooms. We see a deep interest in this community in the subject of meeting practices and group collaborations across a variety of media spaces and contexts. The CSCW conference is an ideal venue for a more extensive exploration of this aspect of meeting space and context research.

MEDIA AND CONTEXTS FOR MEETING MASHUPS

Virtual worlds

Online virtual worlds (e.g. Second Life, Gaia, Qwaq Forums, and There.com) are increasingly used for meetups both casual and formal: political and academic lectures, art exhibit openings, museum tours, and even business meetings. What happens when the broadcast model that is currently used for many of these meetings (by necessity -- technical constraints) becomes more interactive? What kind of meeting support (document sharing, meeting capture and recall) can be developed, and can this support reach into multiple virtual worlds as well as to other media?

Videoconferencing

Useful video systems range from personal desktop or mobile video communication systems such as Skype to professional systems like PolyCom, Sony, and the high-end, high-definition "telepresence" systems like Cisco Telepresence and HP's Halo. How can these people using teleconferencing systems "dial in" to meetings in virtual worlds, or invite participation from people using mobile applications? How are people represented across these diverse environments?

Mobile media

Increasingly distributed work processes along with the ubiquity of mobile devices provide motivation and means for mobile meeting support. But what does it mean to be in a meeting while mobile? Mobile users face higher contextual demands on their attention and thus it may be difficult for them to maintain the level of awareness necessary to follow a meeting in real time [3]. By the same token, it can be difficult for non-mobile participants to understand the disposition of a mobile user [1]. However, systems should not merely make allowances for mobile participants but also allow them to contribute in ways non-mobile participants are not able to.

There are a wide variety of concerns for mobile media: How do people who are mobile contribute to a meeting? How can they interact seamlessly with other mobile users as well as participants in augmented environments? How can systems support mobile meeting participants who may be distributing their attention across multiple activities? What is the right level of awareness to convey between mobile participants and those in augmented environments? How can a system support activities unique to mobile users, such as data capture in the field? How can systems stay user-friendly while dealing with firewall, security and bandwidth issues introduced by involving mobile participants?

Distributed displays or distributed desktops

Current research in high-end room systems often features a multiplicity of thin, bright display screens (both large and small), along with interactive whiteboards, robotic cameras, and smart remote conferencing systems [4,5]. Added into the mix one can find a variety of meeting capture and metadata management systems, automatic or not, focused on capturing different aspects of meetings in different media: to the Web, to one's PDA or phone, or to a company database. Smart spaces and interactive furniture design projects have shown display systems embedded in tables, podiums, walls, chairs and even floors and lighting. Exploiting the capabilities of all these technologies in one room, however, is a daunting task. For example, faced with three or more display screens, all but a few presenters are likely to opt for simply replicating the same image on all of them. Even more daunting is the design challenge: how to choose which capabilities are vital to particular tasks, or for a particular room, or are well suited to a particular culture. How can media mashups take advantage of distributed display systems? What goes where, and why? What control systems are necessary, and how can they adapt quickly to changing technologies?

Social software: applying lessons learned

The impact of lessons from large-scale social software can hardly be overstated in exploring media mashups. Creative uses of filtering and aggregation technologies and enabling multiple open channels between people and their devices/data have led to some of the most interesting and useful applications: Flickr, Twitter, Shozu, and Mosh, for example. Following these models, we see potential for new models of smart meeting space usage and development.

Remixing

When using a variety of different media to collaborate, many aspects of communication require reinspection [2]. For example, shared context, effortlessly managed in face-to-face communication, may take on new meaning when mobile participants interact via voice, video, and text with colleagues in a virtual space. Another challenge is interface consistency across media and contexts: How might a meeting participant connected via videoconferencing or a mobile device control an avatar? And how might a participant who is using an avatar indicate non-verbal cues to a mobile participant? Finally, expectations of response times may different considerably across media. How can collaboration software be designed to bridge synchronous and asynchronous interaction?

WORKSHOP FORMAT, ACTIVITIES, GOALS, SCOPE

Format: Focus will be on discussion and idea sharing, rather than presentation. We will start with a round-robin introductory session (a couple of minutes per participant), immediately followed by a subset of invited panels, demonstrations and/or short talks on workshop sub-topics, which will serve as provocations and points of departure for later discussion.

Activities: We will begin with brief reviews of and remarks on salient research; a few lightning demos; discussions (alternating between breakout teams to identify and classify areas of interest, and larger whole-group discussions) and

finally proceed to a collation of ideas. The session will also provide a quick "state of the art" overview to participants.

Goals: We will focus on the theme of remixing media in collaborative spaces with the goal of better understanding how to support a wider variety of meetings. This may also encourage a redefinition of the notion of a meeting. Another goal is to outline a set of open research challenges for media mashups in support of meetings that span technological and usability issues.

Scope: The scope of interest includes but is not limited to (in no particular order): the integration of augmented environments and smart conference rooms with virtual reality and mobile technologies; tools, applications, and other infrastructure to support a blending of media during meetings; the roles of sensing and context awareness; and evaluation metrics and methodologies for mixed media meeting spaces.

ORGANIZERS OF THE WORKSHOP

We are a deliberately diverse group, drawing from several disciplines (computer science, electrical engineering, business systems, smart room hardware/software design, social science, and interactive architecture/design) and cultures (Japan, US, France, Canada). All of us have been working in aspects of collaborative environments and smart meeting rooms in particular, for many years in both academia and industry.

Maribeth Back is a senior research scientist at FXPAL, and heads the Immersive Collaboration Environments project, focused on mixed-reality workplaces. She has worked on a number of smart environment systems as well as mixed reality projects at Xerox PARC, MIT Media Lab and Harvard Graduate School of Design. **Scott Carter** is a research scientist at FXPAL. He has developed several ubicomp technologies, including peripheral displays and capture and access systems. **Saadi Lahlou** is a social psychologist who heads the Laboratory of Design for Cognition at EDF R&D, a user laboratory in a large end-user organization that pushes the state of the art and fosters dissemination. He is the coordinator of the RUFAE (research on user-friendly augmented environments) network. **Masatomi Inagaki** is a technology planner who heads the smart environment design team in Fuji Xerox's ubiquitous technology area. Currently, his work is focused on designing next-generation workplaces for effective and creative collaboration. **Kazunori Horikiri** is a senior architect at Fuji Xerox with expertise in ubiquitous computing and distributed computing. Currently, his work is focused on designing computing-embedded workplaces that enable knowledge workers to achieve effective and creative collaboration. **Gerald Morrison** is Director of External Research for SMART Technologies.

SOLICITING PARTICIPATION

We will strive to attract diverse viewpoints, including people from different cultures, research areas, and disciplines, while maintaining a cohesive line of inquiry throughout the workshop. We hope to engage people with expertise in virtual worlds, social software, smart environments for the workplace, multimedia communication, ubiquitous display systems, user-centered design, evaluation methods, and mobile and ubicomp applications; and to draw engineers, researchers, and designers from both industry and academia. We will post a web site at http://www.fxpal.com/CSCW2008/ to describe the workshop. The site will be linked from each of our organizations' web sites. We will also distribute flyers at appropriate related sites, post to email lists, and directly solicit potential attendees.

Selection of workshop participants and presentations will be based on refereed submissions. Authors are invited to submit a 1-2 page position statement describing their interest, experience or ongoing research in the field, and including a brief biography. Position statements should have only one author, and admission to the workshop will be for that person only. Position statements should be sent directly to back@fxpal.com and will be published on the website. We would like to cap the workshop at about 20 participants (including organizers). The depth of response to previous workshops reveals considerable continued interest in the topic, and we believe that entry will be competitive.

EXPECTED OUTCOME OF THE WORKSHOP

One objective of this workshop is to form an ongoing framework for media mashups to support meetings. This includes writing a collective paper outlining different approaches as well as infrastructural support, with the aim of publication in a major journal.

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