
Towards a Cooperative Media Space

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Abstract

In this paper we introduce our current work on the concept and implementation of a cooperative media space that connects two remote labs via a permanent audio-video channel and supports single-user, single-group, and group-to-group interaction on synchronised large displays.

Author Keywords

Computer-Supported Cooperative Work; Computer-Mediated Communication; Media Space; Roomware; Tabletops; Single-Display Groupware.

ACM Classification Keywords

H.5.2 [Information Interfaces and Presentation]: User Interfaces — Graphical User Interfaces, User-Centred Design; H.5.3 [Information Interfaces and Presentation]: Group and Organisation Interfaces — Computer-Supported Cooperative Work.

Introduction

In our cooperative media space we aim to build a flexible environment supporting easy communication and cooperation within collocated groups, and among distributed sub-groups. We combine concepts for easy interaction among remote users based on permanent audio or video connections, and for easy interaction among collocated users based on shared hardware and software.

In computer-supported cooperative work and computer-mediated communication several concepts and systems for remote interaction have been developed within the last decades. For instance, media spaces are systems that 'support distributed work groups through access to information that supports general awareness', which 'may lead to informal interactions, spontaneous connections...' [2]. They were motivated by the fact that 'informal interaction, spontaneous conversations, and even general awareness of people and events at other sites' should not be neglected in geographically distributed groups [1].

In human-computer interaction several novel styles of single-user and cooperative interaction with emerging hardware have been developed. For instance, the i-LAND environment consists of several roomware components that are 'computer-augmented objects integrating room elements with information technology' [5]. Two prominent roomware components are the DynaWall: a very large display that can be shared among users and that features some novel interaction styles; and the InteracTable: a tabletop that can be used cooperatively.

On a whole the concepts of media spaces and roomware are highly complementary. Media spaces and related approaches provide informal awareness and support spontaneous, synchronous, distant communication. They are permanently available and offer walk-up and simple interaction. The i-LAND, its roomware components and related approaches provide enhanced support for close cooperation in collocated groups.

Cooperative Media Space

The cooperative media space has to meet both requirements for general awareness and informal communication from traditional media spaces and additional requirements for enhanced cooperation support. The following are three core requirements:

- *Awareness and communication on large displays:* CMS should provide general awareness among distributed groups in order to support informal and spontaneous interaction.
- *Group interaction with large displays:* CMS should provide easy and intuitive single-user and cooperative interaction based on large displays.
- *Group-group interaction over distance:* CMS should support distributed cooperation among distant sub-groups based on large displays.

Approach

CMS have considerable technical pre-requisites. We, therefore, combined a human-centred approach putting the users and their interaction with the CMS in the centre, with a technology-push approach informing design by exploring existing base technology, and developing new technology.

Current State

With respect to the human-centred design we developed a concept for a CMS with a group of designers with backgrounds in media design and in architecture. Figure 1 our first mock-up of the CMS: its basic concept and a picture of a trial of the group-group interaction.

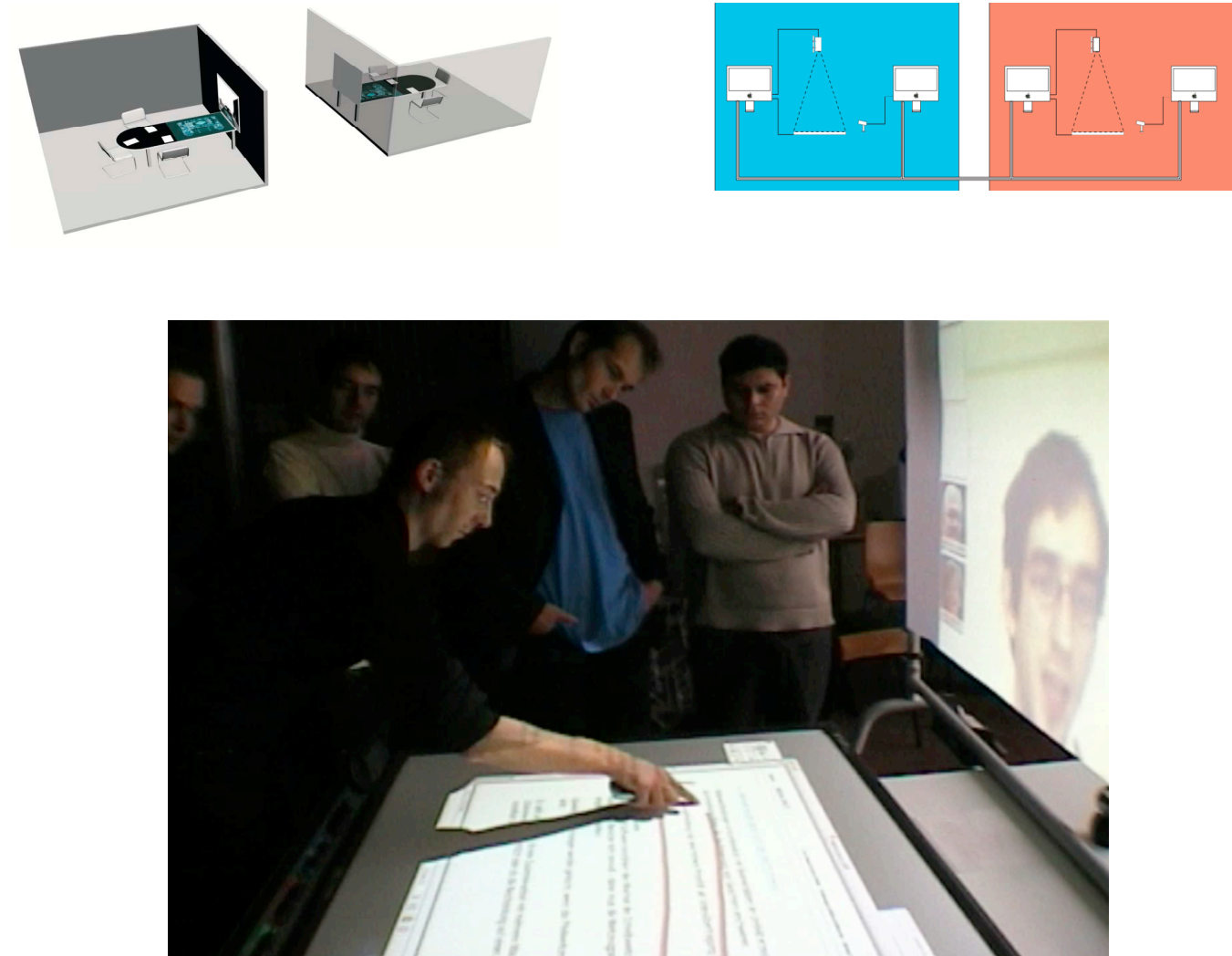


Figure 1. First mock-up of the CMS: concept (top); picture of a trial of the group-group interaction (bottom).

With respect to the technology-push we have developed two platforms that provide important base technology: Sens-ation and PRIMI. Sens-ation provides a platform for the development of sensor-based environments [3]; and PRIMI provides a platform for the development of instant messaging applications and awareness displays [4]. Furthermore, we are currently exploring multi-user, multi-device input for the single-groupware display and bluetooth for the identification and authentication of users.

Conclusions

In this paper I have described some issues of cooperative media spaces, and introduced the environment we are currently developing.

In this position paper I could only address some selected items. In the workshop I would be particularly interested in discussing results and ideas for conceptual issues of single-display groupware where multiple users with multiple devices are interacting with large displays, of group-group interaction based on coupled large displays, and so forth as well as technical issues of developing base technology for these types of environments.

Biographical Information

Tom Gross is associate professor for Computer-Supported Cooperative Work and head of the Cooperative Media Lab at the Faculty of Media of the Bauhaus-University Weimar, Germany. His research interests include Computer-Supported Cooperative Work, Human-Computer Interaction, and Ubiquitous Computing. From 1999 to 2003 he was a senior researcher at the Fraunhofer Institute for Applied Information Technology FIT in St. Augustin, Germany.

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