



Collaboration Meets Interactive Surfaces (CMIS): Walls, Tables, Mobiles, and Wearables

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Abstract

This workshop proposes to bring together researchers who are interested in improving collaborative experiences through the combination of multiple interaction surfaces with diverse sizes and formats, ranging from large-scale walls, to tables, mobiles, and wearables. The opportunities for innovation exist, but the ITS, CHI, CSCW, and other HCI communities have not yet thoroughly addressed the problem of bringing effective collaboration activities together using multiple interactive surfaces, especially in complex work domains. Of particular interest is the potential synergy that one can obtain by effectively combining different-sized surfaces and sharing information between devices.

Author Keywords

Collaboration, interactive surfaces, large display walls, tabletops, mobile, multi-touch interaction, wearables.

ACM Classification Keywords

H.5.m [Information interfaces and presentation (HCI)]: Miscellaneous.

General Terms

Design; Human Factors

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Figure 1: Eery Space: a remote user controls the wall, two users in different physical spaces engage in a collaborative activity (indicated by the same color of their auras) and a fourth user looks at them through a virtual window.

Introduction

Large scale displays and interactive surfaces offer a unique visualization environment favorable to both individual and collaborative design tasks [6, 8]. During the last decade these devices have become both affordable and easier to setup, providing highly interactive environments with high resolution and support for stereoscopic images. Combined with emerging input devices, these provide new ways to interact with content as well as enabling new applications to support collaborative engineering tasks as well as many other activities, which involve communication, coordination, and cooperation [7].

Additionally, new devices have become available to enhance these interactions, including tablets combining several sensors [4], non-intrusive tracking solutions based on depth cameras, wearable devices, and other equipment. Despite this rapid technological advance, however, it still remains an unsolved problem how to bring effective collaboration capabilities to this myriad of heterogeneous interactive surfaces. This workshop aims at bringing together the most advanced techniques, user interfaces, and technological issues that are crucial in fostering co-located collaboration and remote communication between users across different facilities simultaneously [9].

Following the success of the workshop on Collaboration Meets Interactive Surfaces (CMIS) co-located at ITS 2014 and 2013 [1, 3], we propose to host another workshop at ITS 2015 in Madeira, Portugal. In the 2014 edition of the workshop, a total of 21 participants attended and in 2013, 27 participants attended. Participants exchanged experiences regarding collaborative user interface design and evaluation techniques involving interactive surfaces, in both remote and co-located settings. Some previous CMIS workshop papers discussed issues focusing on collaborative

design space with proxemics [11] (see Figure 1), geospatial interaction on tabletops [13] (see Figure 2), collaborative medical visualization on tabletops [14] (see Figure 3), multi-user presentation software on large high resolution touch walls [12] (see Figure 4), mid-air gestures to support disabled users on tabletops [5] (see Figure 5), and software visualization on tabletops [2] (see Figure 6).

Relevance to ITS Community

The vast screen real estate, which is provided in large-scale interaction environments presents novel ways to visualize and interact with data-rich models. In parallel to this technological revolution, interactive surfaces have also become widespread in different sizes and devices, from large-scale walls to small tablets. Indeed, the ITS, CHI, CSCW and MobileHCI communities witnessed, in recent years, an increased usage of large display walls, interactive tabletops, tablet-sized surfaces, mobile phones, and wearables [10].

Topics of Workshop

Topics of the workshop to include (but not limited to):

- Design and evaluation of collaborative environments with interactive surfaces, either remotely or co-located;
- Collaborative applications on interactive surfaces for different domains (e.g. meeting rooms, 3D visualization, mechanical engineering, medical visualizations, emergency response scenarios, criminal intelligence);
- Communication, cooperation and coordination as well as social protocols;
- Interactive surfaces to enhance spatial perception of content and/or support navigation during collaboration activities;



Figure 2: Bancada: multiple users collaboratively exploring geospatial information space with an overview map displayed on a tabletop.



Figure 3: SimMed: multiple students collaborating around a tabletop for medical training.

- Issues when moving from desktop-based collaboration to large-scale walls, tabletops, touch-based mobile devices, and wearables;
- Integration of different devices and surfaces (Walls, Tables, Mobiles, Wearables) for collaboration;
- Physical navigation between different devices;
- Collaboration paradigms and user interface designs that address enhancement of collaborative activities using interactive surfaces and tabletops;
- Collaborative sense making and visual analytics with different interactive surfaces and devices;
- Theories and applications of social science for interactive surfaces and devices.

Organizing Committee

The following people form the organizing committee:

Craig Anslow is a Senior Postdoctoral Research Fellow at Middlesex University, UK. His research interests include multi-surface environments for emergency management and criminal intelligence as well as engineering novel visual analytics applications.

Pedro Campos is an Assistant Professor at the University of Madeira, Portugal. His research interests include interaction design, augmented reality, natural interaction for modelling, and museums and cultural heritage.

Laurent Grisoni Laurent Grisoni is a Professor in computer science at university of Lille (France), also associated to CNRS and INRIA (MINT research group).

His research interest deal with tactile and gesture-based interaction, in the fields of virtual reality and HCI. He is also interested in the art-science relation.

Andrés Lucero is an Associate Professor at the University of Southern Denmark in Kolding. His interests lie in the areas of mobile human-computer interaction, co-design, and design research.

Program Committee

The Program Committee (PC) for the workshop will review papers and help promote the workshop in the ITS, CHI, CSCW, MobileHCI, and other HCI communities. The following people have agreed to serve on the PC:

Jason Alexander - Lancaster University, UK
 Mirjam Augstein - University of Applied Sciences Upper Austria, Austria
 Robert Biddle - Carleton University, Canada
 Jacob Biehl - FX PAL, USA
 Rachel Blagojevic - Massey University, New Zealand
 Raimund Dachselt - TU Dresden, Germany
 Andreas Dippon - TU Munich, Germany
 Alfredo Ferreira - TU Lisbon, Portugal
 Nick Graham - Queens University, Canada
 Petra Isenberg - INRIA, France
 Judy Kay - University of Sydney, Australia
 Kris Luyten - Hasselt University, Belgium
 Frank Maurer - University of Calgary, Canada
 Alexander Nolte - University of Bochum, Germany
 Harald Reiterer - University of Konstanz, Germany
 Stacey Scott - University of Waterloo, Canada
 Tony Tang - University of Calgary, Canada
 Theophanis Tsandilas - INRIA, France



Figure 4: The Cube: running CubIT a large scale multi-user presentation and collaboration platform.



Figure 5: Disabled users performing mid-air gestures via a Leap Motion device to interact with a tabletop.

Time	Activity
0900–0930	Welcome and introductions
0930–1030	Invited talk by Joaquim Jorrgge (Technical University of Lisbon)
1030–1100	<i>Morning Break</i>
1100–1230	Presentation of workshop papers (lightning talks)
1230–1400	<i>Lunch Break</i>
1400–1530	Split into groups based on themes: from the workshop and discuss
1530–1600	<i>Afternoon Break</i>
1600–1730	Group design activity Closing remarks from OC

Table 1: Workshop Planned Activities

Planned Activities and Format

Table 1 outlines the proposed planned activities of the one-day workshop. In the first session we will have welcome and introductions by all attendees, followed by an invited talk by Joaquim Jorge from the Technical University of Lisbon. After the morning break the second session will have lightning talks of workshop papers from attendees. Lunch will follow to allow attendees to meet and mingle. In the third session attendees will split into groups based on themes related to the goals of the workshop. Once the groups have been formed discussions will happen amongst attendees and the groups will report back about this discussions. The fourth session will involve a group design activity based on the discussions from the previous session. Finally there will be some closing remarks from the organizing committee as well as feedback from attendees.



Figure 6: SourceVis: multiple users collaborating with multiple software visualizations being displayed on a tabletop.

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