ITS 2014

November 16 - 19
Dresden, Germany

Program

2014 ACM International Conference on
Interactive Tabletops and Surfaces

Association for
Computing Machinery

SIGCHI
special interest group computer human interaction

MULTI TACTION

Interaction Unlimited

Marker id: 2447

This is your personal
MultiTaction Codice card

Codice # 2591

MULTI TACTION
www.multitaction.com

Code: 2591
-89.2

Code: 46
-90.0

Pen id: 2537

er id: 2532

Finger id: 2533

er id: 2535

Finger id: 2548

Finger id: 2534

Live demo
@ Salon Rotterdam

www.multitaction.com   sales@multitaction.com

Table of Contents

SPONSORS & SUPPORTERS

Sponsor:

Academic Supporter:

Gold Supporter:

Silver Supporters:

Bronze Supporters:

Friends of ITS:

Additional Supporter:

WELCOME TO ITS 2014

We are very happy to welcome you to the ninth ACM International Conference on Interactive Tabletops and Surfaces, held November 16-19, 2014 in Dresden, Germany. This is a city of music, art and beautiful architecture, hosting baroque heritage and stunning art treasures. Dresden is also a thriving modern city on the forefront of technological advances and research, in particular in micro-electronics and information technology. Held in a city of science and culture, ITS 2014 will focus on the *culture of interaction*, reflecting that interactive surfaces have become part of our everyday life and culture.

The nine years over which the conference has been held have seen a tremendous evolution in technologies supporting surface-based interaction, leading this year's program to include a range of novel topics around the use of both horizontal and vertical surfaces, mobile surfaces in various sizes, mixed-surface interaction, and embodied interaction around the many displays that surround us. Since its earliest days, ITS has involved partnership between industry and academia. This is as true as ever in 2014, which features a strong selection of papers devoted both to pure research and to concrete application of surface technologies. This year, the conference received 112 paper and note submissions from all over the world, of which 31 were selected, for an acceptance rate of 27.7%.

A traditional highlight of ITS is its demonstration session, held on Monday evening. It showcases latest technologies and inspiring ideas. Share with others a unique hands-on experience of 14 demonstrations from academic presenters plus several industrial exhibits. In addition, the ITS poster session will allow early access to work in progress, with 23 posters presented. Six students are presenting their work in the Doctoral Symposium. All 43 contributions will be presented in a breath-taking fast-forward madness.

Besides a collection of studios, tutorials and workshops on cutting-edge topics on Sunday, we also welcome two distinguished keynotes. The opening plenary will be presented by Professor Jun Rekimoto of the University of Tokyo and Sony Computer Science Laboratories. The closing keynote will be delivered by Professor Joachim Sauter of the University of the Arts in Berlin and co-founder of ART+COM.

We are highly grateful to our sponsor ACM SIGCHI and the corporate supporters (see opposite side), without whom the conference would not have been possible. Finally, the conference has been organized completely by volunteers who have selflessly performed a tremendous amount of work. We list on the back of the program the many people who contributed to making this conference happen. To all of you, we offer our most sincere and grateful thanks.

Now it is time to assemble in Dresden, to exchange ideas, to meet people and to celebrate.
Enjoy the conference!

| Raimund Dachselt | Nicholas Graham | Kasper Hornbæk | Miguel Nacenta |

GENERAL INFORMATION

ACM ITS 2014

As the 9th event in an annual series starting in 2006, ACM ITS has been established as a premier venue for research in the design, development and use of new and emerging tabletop and interactive surface technologies. Interactive Surfaces increasingly pervade our everyday life, appearing in various sizes, shapes, and application contexts offering a rich variety of ways how to interact with them. Dresden as a beautiful city of culture with stunning baroque architecture will be a broad-minded host for bringing together researchers and innovators from a variety of backgrounds from all over the world.

Cloak Room & Luggage

There is no central Cloak Room, but several coatracks, which are at your disposal. Be aware that the host takes no warranty for your attire. This also includes things you leave in the conference rooms between talks. There will be a lockable storage room for luggage during the last day. Please ask at the registration desk for access.

Holiday

On Wednesday, November 19, 2014 Saxony is celebrating the „Day of Prayer and Repentance" (Buß- und Bettag). This means stores are generally closed, with some exceptions. Gas stations are still open, as are restaurants and hotels. The LIDL supermarkets at "Dresden Hauptbahnhof" and "Bahnhof Dresden Neustadt" are also open during holidays, so you can buy food and other basic products.

Mobile App

You can get the "ACM ITS 2014" mobile app from the Google Play Store or Apple App Store. A Windows Phone version is not available. The app enables you to browse the conference program, create your own schedule, view the map of the conference area and create your own reading list for papers, which you are interested in.

Public Transport

The next public transport station from the Hilton is "Synagoge" to the east. To get to "Dresden Hauptbahnhof" (central station) you can access the tram line 3 direction "Coschütz" or the tram line 7 direction "Pennrich Gleisschleife". The website of the public transport company of Dresden, www.dvb.de, provides you with additional information regarding lines and departure times and is available in English. As an alternative source to access this information, you can use the "Öffi" android app from the Google Play Store or the "FahrInfo Dresden" app from the Apple App Store.

Registration Desk

The registration desk is your central point of information for your registration, questions and concerns. Here you can find useful information all around the conference. The opening hours are:

Sunday	08:00 - 18:00
Monday	07:30 - 19:00
Tuesday	08:00 - 19:30
Wednesday	09:00 - 17:30

Smoking Policy

The Hilton is a non-smoking facility. If you want to smoke, please use the designated smoking areas outside of the building.

Student Volunteers

ITS 2014 has many Student Volunteers, easily recognizable by their colored ITS Hoodies. They are at your disposal to answer questions and help your way around the conference. Don't hesitate to approach them.
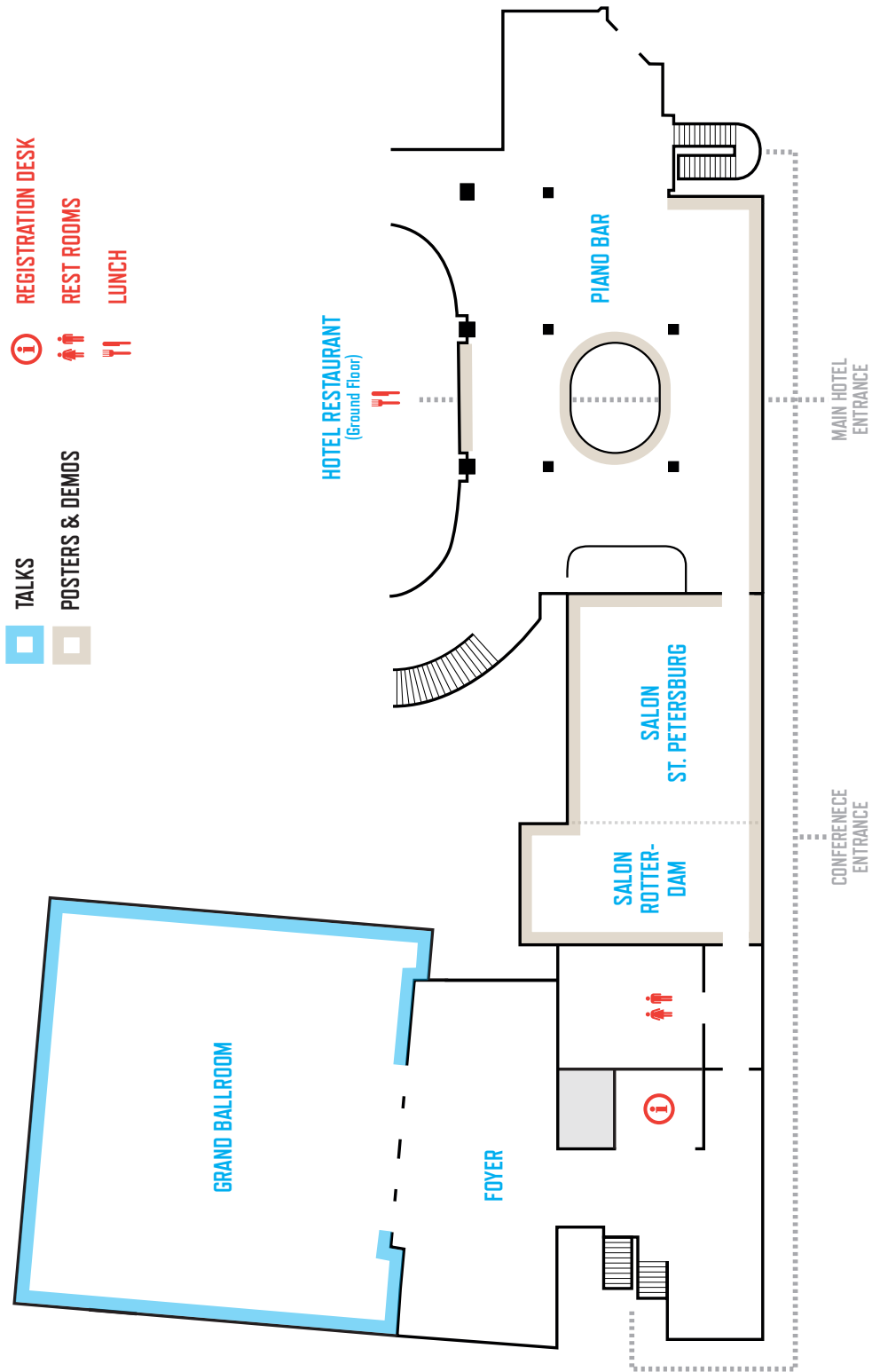
Taxi

Taxis can be called either by using the central taxi call for Dresden or by using the '8mal8' chauffeur service, which provides black limousines.

Central taxi call: +49 (0) 351 211 211
8mal8: +49 (0) 351 8888 8888

FLOOR PLAN

page 6

page 7

SALON
DRESDEN

SALON
DÜSSEL-
DORF

SALON
FRANK-
FURT

SALON
MAINZ

SALON
BERLIN

SALON
WEIMAR

BUSINESS
CENTER

EXECUTIVE
LOUNGE

FROM
PIANO
BAR

**WORKSHOPS, TUTORIALS,
STUDIOS & DOCTORAL
SYMPOSIUM**

REGISTRATION DESK
REST ROOMS
LUNCH

TALKS
POSTERS & DEMOS

HOTEL RESTAURANT
(Ground Floor)

PIANO BAR

MAIN HOTEL
ENTRANCE

SALON
ST. PETERSBURG

SALON
ROTTER-
DAM

CONFERENECE
ENTRANCE

GRAND BALLROOM

FOYER

CONFERENCE AT A GLANCE

	SUNDAY, **NOV 16**	MONDAY, **NOV 17**

SUNDAY, NOV 16

09:00 - 12:30   p.10
Workshops, Tutorials & Studios
Doctoral Symposium
Morning Sessions

(coffee break from 10:30 - 11:00)

Lunch Break

14:00 - 17:30   p.10
Workshops, Tutorials & Studios
Doctoral Symposium
Afternoon Sessions

(coffee break from 15:15 - 15:45)

19:00 - 22:00   p.13
Welcome Reception
Pulverturm an der Frauenkirche

MONDAY, NOV 17

09:00 - 10:15   p.15
Conference Opening
Opening Keynote by Jun Rekimoto

Coffee Break

11:00 - 12:00   p.16
Session 1: Gestures

Lunch Break

13:45 - 15:00   p.17
Session 2: Hardware, Sensing and Frameworks

Coffee Break

15:30 - 16:10   **Poster & Demo Madness**

16:10 - 17:10   p.18
Session 3: Surfaces for Geo-Applications

18:30 - 22:00   p.20
Posters & Demos Night
with Buffet Dinner

Time column: 09:00, 10:00, 11:00, 12:00, 13:00, 14:00, 15:00, 16:00, 17:00, 18:00, 19:00, 20:00, 21:00, 22:00, 23:00

TUESDAY, **NOV 18**

09:00 - 10:20	p.31
Session 4: Multi-Surface	

Coffee Break

10:50 - 12:00	p.32
Session 5: Children and Learning	

Lunch Break

13:00 - 14:00
Guided Tour: Frauenkirche

14:30 - 15:30	p.33
Session 6: Space, Activities & Workplace	

Coffee Break

16:15 - 17:15	p.34
Townhall Meeting	

20:00 - 23:00	p.34
Conference Banquet	
Ballroom Lindengarten	

WEDNESDAY, **NOV 19**

09:30 - 10:25	p.37
Session 7: Touch, Pressure and Reality	

Coffee Break

11:00 - 12:20	p.38
Session 8: In the World	

Lunch Break

13:00 - 14:00
Guided Tour: City Center

14:00 - 14:55	p.39
Session 9: Tangibles	

Coffee Break

15:30 - 16:30	p.41
Closing Keynote by Joachim Sauter	
16:30	
Farewell	

09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
19:00
20:00
21:00
22:00
23:00

TUTORIALS, WORKSHOPS AND STUDIOS

9:00 - 17:30
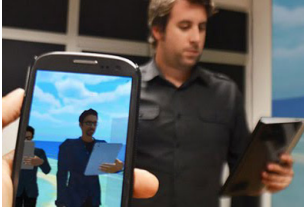
Workshop

Salon Dresden

Full-day event

9:00 - 17:30

Collaboration Meets Interactive Surfaces: Walls, Tables, Tablets, and Phones

Craig Anslow, Pedro Campos, Alfredo Ferreira

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, tablets and phones. The opportunities for innovation exist, but the ITS, CSCW, and 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.
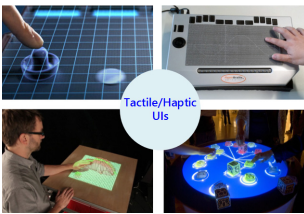
Workshop

Salon Frankfurt

Half-day event

13:30 - 18:00

Tactile/Haptic User Interfaces for Tabletops and Tablets

Limin Zeng, Gerhard Weber

Tactile/haptic user interfaces have been becoming one of the important approaches to improve user experiences on various tabletops and tablets. This workshop proposes to bring researchers who are working or interested in the field together, and share their research experiences. In addition to tactile displays and tablets, the workshop focuses on haptic tangible user interfaces, fusion of visual and tactile/haptic feedback, and accessibility studies via tactile/haptic user interfaces. Through this workshop we plan to establish a working group for possible collaboration.
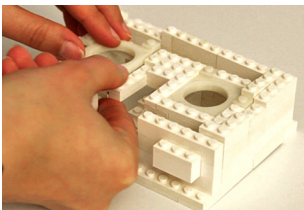
Tutorial

Salon St. Petersburg

Half-day event

14:00 - 17:30

Hot Topics in Personal Fabrication Research

Stefanie Mueller, Alexandra Ion, Patrick Baudisch

In this tutorial, we survey novel ways for interacting with personal fabrication machines, such as laser cutters, milling machines, and 3D printers. The goal is to provide attendees with an overview of recent HCI research in personal fabrication and together with attendees build a roadmap for future research directions. Towards this goal, the tutorial will provide background knowledge in how personal fabrication machines work, which types of objects they can fabricate, and how they are currently being operated.

TUIO Hackathon

Martin Kaltenbrunner, Florian Echtler

While the original TUIO specification has been implemented for various hardware and software environments, the next TUIO generation does not yet provide many feature complete reference implementations, although its specification has been finalized and partially implemented by community members. This TUIO Hackathon is addressing expert users and developers of hardware and software environments for surface-based tangible user interfaces that are interested in experimenting with the new TUIO framework, with the goal of initiating the development and integration of new TUIO implementations.

Studio

Salon Düsseldorf

Full-day event

9:00 - 17:30

DOCTORAL SYMPOSIUM

9:00 - 17:30 *Salon Mainz • Morning Sessions: 9:00 - 12:30 • Afternoon Sessions: 14:00 - 17:30*
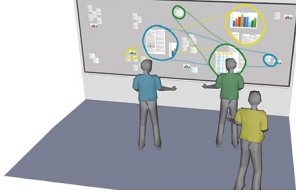
Explicit & Implicit Interaction Design for Multi-Focus Visualizations

Simon Butscher

The aim of this work is to explore alternative interaction concepts for multi-focus visualizations in the context of single and multi-user scenarios. Alongside explicit interaction for navigating within multi-focus visualizations implicit interaction for making the visualization react on the social and spatial context is investigated.
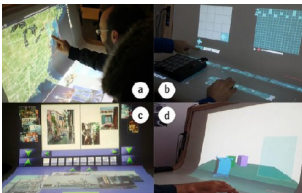
Towards an Interaction Model for Multi-Surface Personal Computing Spaces

Henri Palleis

In my thesis I want to provide guidelines that help user interface designers to develop interaction techniques for multi-surface personal computing spaces that comprise both horizontal and vertical touchscreens and show potential benefits of a seamless connection between them (e.g. a curved display segment).

Improving Interaction Discoverability in Large Public Interactive Displays

Victor Cheung

This work models the underlying interaction process with public interactive displays, and develops a laboratory-based experimental methodology that enables more rapid and controlled evaluation of potential interaction design strategies. Readers can benefit from gaining insights in designing and building better and more usable large interactive systems for public settings.
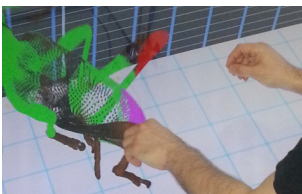

Touching the Third Dimension

Paul Lubos

Natural interaction offers the user a great immersive experience and is easier to learn and utilize than classic human-computer interfaces. Our research aims to identify the problems during the design of 3D UIs and the interaction with virtual objects in 3D space, and find ways to solve or avoid those problems.

Supporting Everyday Thinking Practices in Information Visualization Interfaces

Jagoda Walny

People commonly sketch externalizations on paper and whiteboards in their everyday thinking processes. My research aims to better understand these thinking sketches from the perspective of information visualization and pen-and-touch interaction and to apply this understanding to the design of interfaces that better support complex and free-form everyday thinking practices.
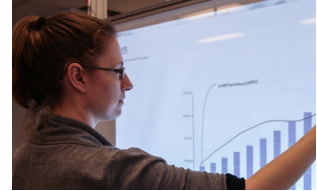
Exploiting Spatial Memory and Navigation Performance in Dynamic Peephole Environments

Jens Müller

One way to handle the representation of (and the navigation in) large datasets is by provisioning movable viewports – so-called dynamic peepholes. In my research I investigate how information spaces and the navigation with dynamic peepholes need to be designed in order to exploit spatial memory and navigation performance.

WELCOME RECEPTION

19:00 - 22:00 *Pulverturm an der Frauenkirche*

Pulverturm an der Frauenkirche
An der Frauenkirche 12
01067 Dresden

For a better orientation you can find this location labeled on our city map on the last page!

NOTES

CONFERENCE OPENING

9:00 - 9:15 *Grand Ballroom • General and Program Chairs*

OPENING KEYNOTE BY JUN REKIMOTO

9:15 - 10:15 *Grand Ballroom* *University of Tokyo • Sony Computer Science Laboratories*

A New You: From Augmented Reality to Augmented Human

Abstract

Traditionally, the field of Human Computer Interaction (HCI) was primarily concerned with designing and investigating interfaces between humans and machines. The primary concern of Surface Computing is also still about designing better interfaces to information. However, with recent technological advances, the concept of „enhancing", „augmenting" or even „re-designing" humans themselves is becoming very feasible and serious topic of scientific research as well as engineering development.

„Augmented Human" is a term that I use to refer to this overall research direction. Augmented Human introduces a fundamental paradigm shift in HCI: from human-computer-interaction to human-computer-integration. In this talk, I will discuss rich possibilities and distinct challenges in enhancing human abilities. I will introduce recent projects conducted by our group including design and applications if wearable eye sensing for augmenting our perception and memory abilities, design of flying cameras as our external eyes, a home appliance that can increase your happiness, an organic physical wall/window that dynamically mediates the environment, and an immersive human-human communication called „JackIn".

Biography

Jun Rekimoto received his B.A.Sc., M.Sc., and Ph.D. in Information Science from Tokyo Institute of Technology in 1984, 1986, and 1996, respectively. From 1986 to 1994, he worked for the Software Laboratory of NEC. During 1992-1993, he worked in the Computer Graphics Laboratory at the University of Alberta, Canada, as a visiting scientist. Since 1994 he has worked for Sony Computer Science Laboratories (Sony CSL). In 1999 he formed, and has since directed, the Interaction Laboratory within Sony CSL.

At Sony CSL, Rekimoto initiated and has led the „Real-World User Interfaces" project since 1994. This project produced several notable research accomplishments, including NaviCam (a situationally-aware mobile assistant), Pick-and-Drop (a direct-manipulation technique for inter-appliance computing), Multiple-Device Digital Whiteboard, Augmented Surfaces, and TimeScape (a time-machine user interface environment). Some of these are being commercialized in Sony's VAIO personal computer series.

Rekimoto's research interests include computer augmented environments, mobile/wearable computing, virtual reality, and information visualization. He has authored dozens of refereed publications in the area of human-computer interactions, including ACM, CHI, and UIST. One of his publications was recognized with the 30th commemorative papers award from the Information Processing Society Japan (IPSJ) in 1992. He also received the Multi-Media Grand Prix Technology Award from the Multi-Media Contents Association Japan in 1998, the Yamashita Memorial Research Award from IPSJ in 1999, and the Japan Inter-Design Award in 2003. In 2007, he was elected to ACM SIGCHI Academy.

SESSION 1: GESTURES

11:00 - 12:00 *Chair: Andy Wilson • Grand Ballroom*
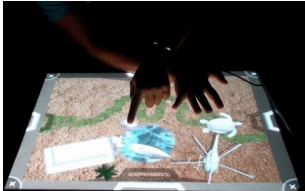
Exploring Narrative Gestures on Digital Surfaces

Mehrnaz Mostafapour, Mark Hancock

This work investigates narrative hand gestures used on digital surfaces while interacting with virtual objects to narrate a story. We found that narrative gestures are fundamentally different than traditional gestures used to interact with on-screen objects. Narrative gestures are used to communicate visual meaning to an audience.

Web on the Wall Reloaded: Implementation, Replication and Refinement of User-Defined Interaction Sets

Michael Nebeling, Alexander Huber, David Ott, Moira Norrie

This paper replicates Morris's Web on the Wall guessability study first using Wizard of Oz for multimodal interaction elicitation around Kinect. To obtain reproducible and implementable user-defined interaction sets, the paper argues for extending the methodology to include a draft of the system for mixed-initiative elicitation with real system dialogue.
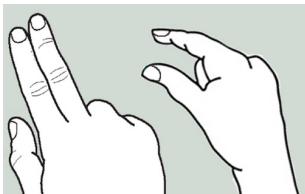
User-defined Interface Gestures: Dataset and Analysis

Daniela Grijincu, Miguel A Nacenta, Per Ola Kristensson

We present a video-based gesture dataset, a taxonomy, and a methodology for annotating video-based gesture datasets. We design and use a crowd-sourced classification task to annotate the videos. The results are made available through a web-based visualization that allows researchers and designers to explore the dataset.

LUNCH BREAK 🍴

12:00 - 13:45

SESSION 2: HARDWARE, SENSING AND FRAMEWORKS

13:45 - 15:00 *Chair: Jason Alexander • Grand Ballroom*

A Survey on Multi-touch Gesture Recognition and Multi-touch Frameworks

*Mauricio Cirelli, Ricardo Nakamura*

We present a survey on touch-based gestures recognition techniques and frameworks. We propose an extended set of requirements such techniques and frameworks should meet in order to provide better support to multi-touch applications. Gestures may be described formally or by user-provided examples. Frameworks integrate the multi-touch sensors drivers to the application and may use different gesture recognizers.
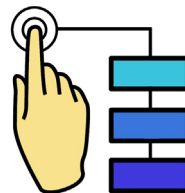
HuddleLamp: Spatially-Aware Mobile Displays for Ad-hoc Around-the-Table Collaboration

Roman Rädle, Hans-Christian Jetter, Nicolai Marquardt, Harald Reiterer, Yvonne Rogers

We introduce HuddleLamp and its novel hybrid sensing approach. This approach combines RGB and depth input for detecting and tracking movements of multiple mobile screens with sub-centimetre precision by exploiting their optical characteristics in both the RGB and IR range.
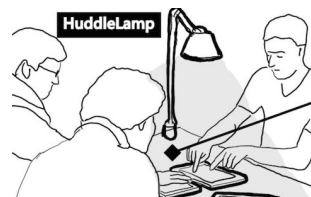
Uminari: Freeform Interactive Loudspeakers

Yoshio Ishiguro, Ali Israr, Alex Rothera, Eric Brockmeyer

We present freeform interactive loudspeakers for creating spatial sound experiences from a variety of surfaces. Our proposed system creates directional sound and can be easily embedded into architecture, furniture and many everyday objects.

Multi-push Display using 6-axis Motion Platform (Note)

Takashi Nagamatsu, Masahiro Nakane, Haruka Tashiro, Teruhiko Akazawa

We developed a novel tactile display that provides a multi-push sensation by using a 6-axis motion platform. When a second finger touches the display, the surface panel declines and the position of the first finger remains unchanged. Thus, the user can push at two positions on the surface panel.
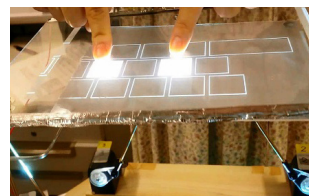
COFFEE BREAK ☕

15:00 - 15:30

POSTER AND DEMO MADNESS

15:30 - 16:10   *Chair: Roman Rädle • Grand Ballroom*

In this session, authors of each demo, poster and doctoral symposium poster have 40 seconds to present their work in a row. This breathtaking fast forward session will whet your appetite to attend their demo or poster. Don't forget to vote for your favorite in the end!

SESSION 3: SURFACES FOR GEO-APPLICATIONS

16:10 - 17:10   *Chair: Harald Reiterer • Grand Ballroom*

Multi Surface Interactions with Geospatial Data: A Systematic Review

Zahra Shakeri Hossein Abad, Craig Anslow, Frank Maurer

Even though Multi Surface Environments (MSE) and how to perform interactions in these environments have received much attention during recent years, interaction with geospatial data in MSEs is still limited. To summarize the earlier research in this area, this paper presents a systematic review of MSE interactions with geospatial data.

The Effects of View Techniques on Collaboration and Awareness in Tabletop Map-Based Tasks

Christophe Bortolaso, Matt Oskamp, Greg Phillips, Carl Gutwin, Nicholas Graham

We report on two studies to understand the effect of view techniques on collaboration and awareness. We first studied the performance of view-techniques on spatial arrangement to understand by how much different view configuration affect group performance in mixed-focus tasks. Then we studies how do people choose to configure their environment when working in a realistic mixed-focus activity.

Spatial Querying of Geographical Data with Pen-Input Scopes

Fabrice Matulic, David Caspar, Moira Norrie

This work presents pen-based techniques to annotate maps and selectively convert those annotations into spatial queries to search for POIs within explicitly input or implicit scopes (areas and paths). We further provide pen gestures to calculate routes between multiple locations. A user evaluation confirms the potential of our techniques.
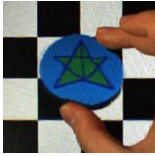
NOTES

MONDAY

POSTERS AND DEMOS NIGHT WITH BUFFET DINNER

18:30 - 22:00 *Salon St. Petersburg, Salon Rotterdam, Piano Bar*

POSTERS

3D Tabletop User Interface Using Virtual Elastic Objects

*Hiroaki Tateyama, Takumi Kusano, Takashi Komuro*

We propose a method to reduce the inconsistency between virtual and real spaces in manipulating 3D virtual objects with users' fingers. By elasticizing a virtual object, our system prevents users' fingers from thrusting into the virtual object and enables 3D interaction with a greater sense of reality.

Cyber Chamber: Multi-user Collaborative Assistance System for Online Shopping

Masafumi Muta, Kenji Mukai, Ryoutarou Toumoto, Motoi Okuzono, Junichi Hoshino, Hiromi Hirano, Soh Masuko

Cyber Chamber system that provides a novel online shopping environment in which several people can shop together in same room, using tablets and projector.
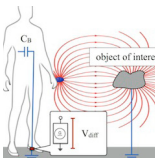
Corona: Haptic Sensation Using Body-Carried Electrostatic Charge for Body Area Network Feedback Companion

Adiyan Mujibiya

Corona is a wearable haptic feedback device that uses electrostatic force to provide physical stimuli when a user touches objects that are electrically grounded, or of opposite polarity. Unlike previous approach, we neither physically actuate objects nor use any hand-worn tactile feedback devices. We introduce a mechanism to artificially build up electrostatic charge within the human body.
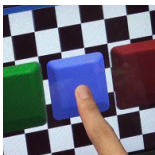
Evaluation of Visuo-haptic Feedback in a 3D Touch Panel Interface

Xu Zhao, Takehiro Niikura, Takashi Komuro

We evaluate the relation between visual and haptic feedback in a 3D touch panel interface and show the optimal latency for natural interaction. The result showed that the visual synchronization of finger and button movements is more important than visual and haptic synchronization.
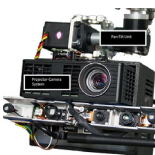
### UbiBeam: An Interactive Projector-Camera System for Domestic Deployment

Jan Gugenheimer, Pascal Knierim, Julian Seifert, Enrico Rukzio

We conducted an in-situ user study by visiting 22 households and exploring specific use cases and ideas of portable projector-camera systems in a domestic environment. Using a grounded theory approach, we identified several categories such as interaction techniques, presentation space, placement and use cases. Based on our observations, we designed and implement UbiBeam, a domestically deployable projector-camera system.

Task Assignment and Visualization on Tabletops and Smartphones

Benedikt Haas, Florian Echtler

We present MultiTask, a hybrid tabletop/mobile system to enable face-to-face discussion, editing and assignment of tasks related to a project team.
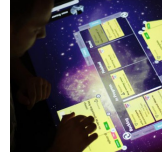
X-O Arch Menu: Combining Precise Positioning with Efficient Menu Selection on Touch Devices

Felix Thalmann, Ulrich von Zadow, Marcel Heckel, Raimund Dachselt

We draw upon existing work in the area of touch accuracy and touch menus to contribute the X-O Arch Menu, which seamlessly combines precise positioning and fast, hierarcial menu selection. Furthermore, we introduce a novel optimization to pie menus that allows usage in limited screen space.

Second Look: Combining Interactive Surfaces with Wearable Computing to support Creative Writing

Pedro Campos, Frederica Gonçalves, Michael Martins, Miguel Campos, Paulo Freitas

We present "Second Look", a platform of interactive surfaces and wearable computing for helping people, in particular creative writers, to overcome writer's block. The novelty of our systems stems from the addition of wearable devices (Google Glass) and crowdsourcing to improve creative writing on tablets and phones.

Making Tabletop Interaction Accessible for Blind Users

Andreas Kunz, Dirk Schnelle-Walka, Ali Alavi, Stephan Pölzer, Max Mühlhäuser, Klaus Miesenberger

This poster describes how the content of a tabletop as well as the corresponding deictic gestures can be made accessible to blind users. Using LEAP Motion sensors and sensor fusion, deictic gestures are detected and output to the blind user together with the serialized content of the tabletop.

Intelligent Ink Annotation Framework that uses User's Intention in Electronic Document Annotation

Hiroki Asai, Hayato Yamana

We propose the Intelligent Ink Annotation Framework that helps the system to increase learnability of annotation systems by detecting recognizable intentions from natural annotation behavior on paper-based documents. Our framework recognizes „Targeting Content" and „Commenting", which are related to extraction of annotation information.
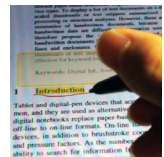

Studying Teacher Cognitive Load in Multi-tabletop Classrooms Using Mobile Eye-tracking

Luis P Prieto, Yun Wen, Daniela Caballero, Kshitij Sharma, Pierre Dillenbourg

In this initial study, we used a mobile eye-tracker to follow the facilitator's cognitive load in several simulated lessons with real school children, conducted in a multi-tabletop environment. The video coding of high- and low-load episodes provided insights on what aspects of managing such multi-tabletop setting can be more challenging for a teacher (e.g., class-wide awareness).


estimated cognitive load
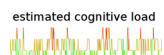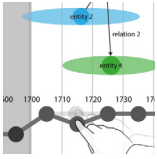
Combining Timeline and Graph Visualization

Robert Morawa, Tom Horak, Ulrike Kister, Annett Mitschick, Raimund Dachselt

Node-link diagrams are the predominant visualization for relations in data. However, nodes' temporal properties are difficult to visualize. Combining timeline and graph visualization, we introduce Time Shadows and Time Beads. Time Shadows provide temporal context for nodes. Time Beads present a new form of timeline supporting continuous and discrete navigation, and multiple focus regions.
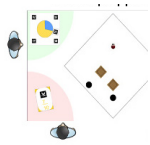
Single Locus of Control in a Tangible Paper-based Tabletop Application: An Exploratory Study

Daniela Caballero, Yun Wen, Luis P Prieto, Pierre Dillenbourg

We describe the design of a novel tangible, paper-based tabletop application for learning about fractions collaboratively. We also describe in detail how we designed its interface with a single element of control (locus of control) to foster equal participation, and how the analysis of its position and rotation can provide insights on the collaboration processes of students.

Interact! An Evidence-Based Framework For Digitally Supported School Field Trips

Alexandra Tanner, Beat Vollenwyder, Michael Kalt, Ulrike Schock, Magdalena Mateescu, Doris Agotai, Peter Gros, Manfred Vogel, Carmen G. Zahn

Interact! is an evidence-based framework for the support of school class visits to science exhibitions featuring a large vertical multi-touch surface and a set of tablet computers. The framework is designed to foster interest in computer sciences and collaborative learning by drawing upon subject areas of personal importance and encouraging small group knowledge processes
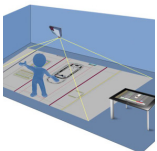
Using Scalable, Interactive Floor Projection for Production Planning Scenario

Michael Otto, Michael Prieur, Enrico Rukzio

A novel system for interactive evaluation and verification of manual assembly processes will be presented. The approach utilizes a scalable, interactive augmented floor surface in combination with a tangible tabletop hardware and a material zone planning software. The floor projection hardware is used for true to scale assembly station layout visualizations.

Interactive Surface Composition Based on Arduino in Multi-Display Environments

Lili Tong, Audrey Serna, Sébastien George, Aurélien Tabard, Gilles Brochet

We presented a new infrastructure that allows dynamic reconfiguration of the interactive space by grouping different devices together. The architecture is based on a Web server and websockets that enables rapid pairing of devices, and simple magnetic switches to provide location awareness of devices relative to each others.

Overcoming Interaction Barriers in Large Public Displays Using Personal Devices

*Victor Cheung, Diane Watson, Jo Vermeulen, Mark Hancock, Stacey Scott*

This work presents a design space in which personal devices are used as a means to facilitate "socially safe", ad-hoc interaction with large public displays. We identify barriers hindering this process, and focus on minimizing the effort required to initiate, sustain, and withdraw from interaction with a large
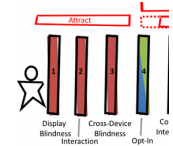
Interactive Tactile Maps for Blind People using Smartphones' Integrated Cameras

Timo Götzelmann

This approach integrates barcodes into tactile maps to allow their detection by standard smartphones' cameras. A mobile application automatically obtains more detailed map data to auditively support the user's exploration of the tactile map. An experimental implementation shows the principal feasibility and provides the basis for comprehensive user studies.
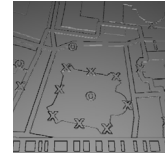
A Cooperative Multitouch Scrum Task Board for Synchronous Face-to-Face Collaboration

Jessica Rubart

A Multitouch Scrum Task Board is presented, which is designed for being used by a team synchronously during face-to-face collaboration. Tasks can be created, explored, sorted, resized, and visually arranged in parallel simultaneously by multiple users on a multitouch display. We present our first experiences using the cooperative Scrum Task Board on a multitouch table.

Exploring Multi-Surface Interactions in Retail Environments

*Sydney Pratte, Teddy Seyed, Frank Maurer*

In this paper we present our early work in the exploration of a multi-surface prototype to create immersive retail environments. Our goal was to utilize interactive devices to explore interactions in a spatially aware retail environment.
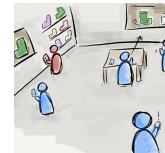
A Multi-Display System for Deploying and Controlling Home Automation

Yucheng Jin, Chi Tai Dang, Christian Prehofer, Elisabeth Andre

This paper introduces a concept of using a home devices mashup tool to wire home devices on a tabletop display in combination with web based UIs on mobile devices to control home devices. This multi-display system supports multiple people to deploy home networked devices co-located collaboratively and control home devices universally with high accessibility and mobility.
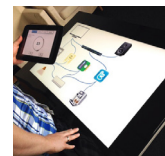
ThumbCam: Returning to single touch interactions to explore 3D virtual environments
Daniel Mendes, Maurício Sousa, Alfredo Ferreira, Joaquim Jorge
Most solutions to navigate 3D virtual environments using small handheld devices rely on multi-touch, which is not always feasible. ThumbCam is a novel single-touch technique for camera manipulation, which allows users to move and look around using only the thumb, offering more operations with a single touch than existing techniques.

### Bancada: Using Mobile Zoomable Lenses for Geospatial Exploration
Francisco Marinho Rodrigues, Teddy Seyed, Frank Maurer, Sheelagh Carpendale
Bancada is a system developed for the exploration of geospatial information in multi-display environments. Users interact with tablets (Zoomable Magic Lenses) to augment an overview map displayed on a tabletop. Bancada is currently being used to research user interfaces separated across multiple devices and interactions with high-resolution mobile devices.
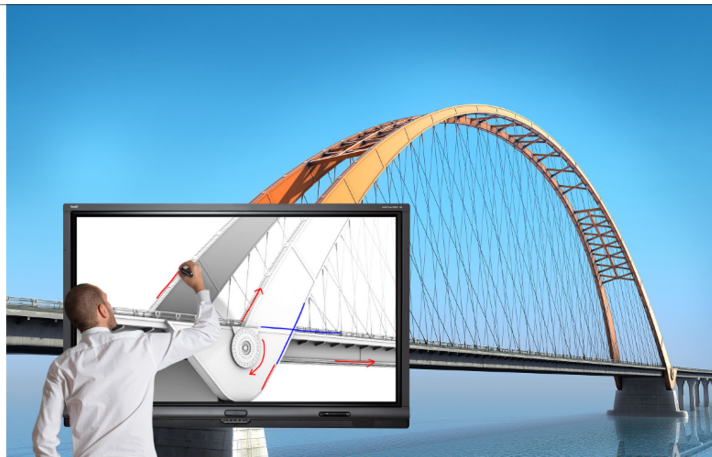
NOTES

NOTES

DEMOS

ClothLens Demo: Simultaneous Multi-User Interaction with Shared Content on a Tabletop

Christian Lander, Sven Gehring

Multiple users simultaneously interacting with the shared content by panning or zooming on a tabletop often lead to conflicts due to interference. We present ClothLens, a technique allowing for simultaneous interaction of multiple users with shared digital content. ClothLens utilizes the Focus+Context pattern enabling users to create personal lenses on top of the map. The map is organized as a physical cloth object that can be bend or stretched.

The Interactive Dining Table, or: Pass the Weather Widget, Please

Florian Echtler, Raphael Wimmer

Large-scale interactive surfaces have not yet made the transition from the lab to everyday life. We explore 3 potential scenarios for an interactive dining table in the home: augmented board games, ambient notifications and augmented dining.

CubeQuery: Tangible Interface for Creating and Manipulating Database Queries

Ricardo Langner, Anton Augsburg, Raimund Dachselt

We demonstrate CubeQuery, a tangible user interface providing a physical way to both create and manipulate basic database queries. This interactive installation is designed for individual faceted browsing and allows users to explore contents of a music library by physically arranging tangibles on an interactive tabletop.

Fusion of Mixed-Reality Tabletop and Location-Based Applications for Pervasive Games

*Chris Zimmerer, Martin Fischbach, Marc Latoschik*

Quest - UbiquX fuses a multimodal mixed reality implementation of a traditional tabletop role-play game with a location-based mobile aspect to provide a novel Ubiquitous gaming eXperience (UbiquX).

Multi-Touch Manipulation of Magic Lenses for Information Visualization

*Ulrike Kister, Patrick Reipschläger, Raimund Dachselt*

We present a prototype on touch-enabled magic lenses where each generic lens can be manipulated and parametrized. For activation of different lens functions and parameter setting, we suggest both a widget-based approach for novice users and continuous gestures for experts in one coherent tool.
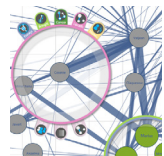

Demonstrating HuddleLamp:
Spatially-Aware Mobile Displays for Ad-hoc Around-the-Table Collaboration

Roman Rädle, Hans-Christian Jetter, Nicolai Marquardt, Harald Reiterer, Yvonne Rogers

We demonstrate HuddleLamp, a desk lamp with an integrated RGB-D camera that tracks movements and positions of mobile displays on a table. HuddleLamp's hybrid sensing combines RGB and depth input for tracking movements of multiple mobile screens with sub-centimetre precision by exploiting their optical characteristics in RGB and IR range.
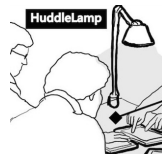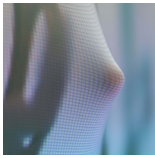
FlexiWall: Exploring Layered Data with Elastic Displays

Mathias Müller, Anja Knöfel, Thomas Gründer, Ingmar Franke, Rainer Groh

By their deformable screen-materials elastic displays and projection screens provide physical three-dimensional interaction modalities like push, pull or bend. Compared with conventional Multi-Touch displays they offer an additional interaction dimension which can be used to explore data. Novel techniques and tools are presented to interact with layered data sets.
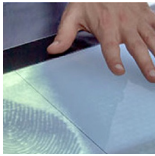
Demonstration and Applications of Fiberio: A Touchscreen That Senses Fingerprints

*Sven Köhler, Christian Holz, Patrick Baudisch*

Presents a tabletop system that simultaneously projects output and scans users' fingerprints on the same surface. A GPU pipeline extracts fingerprint features in real-time for user authentication.

ComforTable - A Tabletop for Relaxed and Playful Interactions in Museums

Michael Storz, Kalja Kanellopoulos, Claudia Fraas, Maximilian Eibl

The ComforTable is an all-in-one interactive tabletop system with integrated seats and a camera based user tracking system. It allows groups of users relaxed interactions with the interface and was designed for and tested in museums and exhibitions. Applications allow competitive play for up to six players. The tracking system tracks tabletop users to offer them information in their proximity.
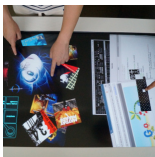
NEMOSHELL Demo: Windowing System for Concurrent Applications on Multi-user Interactive Surfaces

Junghan Kim, Inhyeok Kim, Taehyoung Kim, Young Ik Eom

NEMOSHELL is the windowing system for concurrent applications on multi-user interactive surfaces, which is designed to support multiple simultaneous applications, legacy input devices, legacy applications, and dynamic user interfaces.
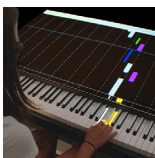
P.I.A.N.O.: Faster Piano Learning with Interactive Projection

Katja Rogers, Amrei Röhlig, Matthias Weing, Jan Gugenheimer, Bastian Könings, Melina Klepsch, Florian Schaub, Enrico Rukzio, Tina Seufert, Michael Weber

(Abstract from their accompanying paper) We propose P.I.A.N.O., a piano learning system with interactive projection that facilitates a fast learning process. Note information in form of an enhanced piano roll notation is directly projected onto the instrument and allows mapping of notes to piano keys without prior sight-reading skills. We report the results of two user studies, which show that P.I.A.N.O. supports faster learning.

BullsEye: High-Precision Fiducial Tracking for Table-based Tangible Interaction

Clemens Klokmose, Janus Kristensen, Rolf Bagge, Kim Halskov

(Abstract from their accompanying paper) BullsEye improves the precision of optical fiducial tracking on tangible tabletops to sub-pixel accuracy down to a tenth of a pixel. Techniques include a fiducial design for GPU based tracking, calibration of light that allows for computation on a greyscale image, and an automated technique for optical distortion compensation.

The Usability of a Tabletop Application for Neuro-Rehabilitation from Therapists' Point of View

*Mirjam Augstein, Thomas Neumayr, Irene Schacherl-Hofer*

(Abstract from their accompanying paper) This paper describes a study that has been conducted to evaluate selected fun.tast.tisch. (a tabletop system for neuro-rehabilitation) modules. The target group usually involves patients (most of them incurred acquired brain injury) and therapists. The study described here focuses on the usability of the system from therapists' point of view.

NetBoards: Investigating a Collection of Personal Noticeboard Displays in the Workplace

Erroll Wood, Peter Robinson

(Abstract from their accompanying paper) NetBoards are situated displays designed to fulfil and augment the role of non-digital personal noticeboards in the workplace. By replacing these with large, networked, touch-enabled displays, we replicate the existing physical systems' flexibility and ease-of-use, while enabling more expressive content creation techniques and remote connectivity.
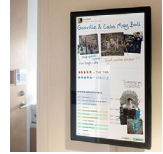
NOTES

SESSION 4: MULTI-SURFACE

9:00 - 10:20 *Chair: Jürgen Steimle • Grand Ballroom*

Surface Ghosts: Promoting Awareness of Transferred Objects during Pick-and-Drop Transfer in Multi-Surface Environments

Stacey D. Scott, Guillaume Besacier, Julie Tournet, Nippun Goyal, Michael Haller
Surface Ghosts virtual embodiments provide user feedback during Pick-and-Drop style cross-device transfer in a tabletop-centric multi-surface environment. Surface Ghosts take the form of semi-transparent "ghosts" of transferred objects displayed under the "owner's" hand on the tabletop surface during transfer.
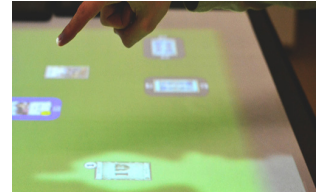
PolyChrome: A Cross-Device Framework for Collaborative Web Visualization

Sriram Karthik Badam, Niklas L. E. Elmqvist
PolyChrome is an application framework for creating collaborative web visualization. The framework supports (1) synchronous and asynchronous collaboration through an API for operation distribution and display management; (2) co-browsing existing webpages; and (3) maintenance of state and input events for managing consistency and conflicts. PolyChrome makes way for creating multi-device ecosystems for ubiquitous analytics over the web.

Cross-Device Interaction
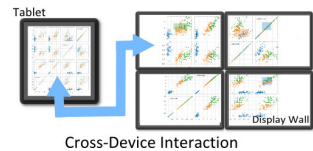
ActivitySpace: Managing Device Ecologies in an Activity- Centric Configuration Space

Steven Houben, Paolo Tell, Jakob E Bardram
To mitigate multi-device interaction problems (such as lack of control, intelligibility and context), ActivitySpace provides an activity-centric configuration space that enables users to integrate and work across several devices by using the space between the devices. We report on a study with 9 participants that shows that ActivitySpace helps users to easily manage devices and their allocated resources while exposing a number of usage patterns.

SleeD: Using a Sleeve Display to Interact with Touch-sensitive Display Walls

Ulrich von Zadow, Wolfgang Büschel, Ricardo Langner, Raimund Dachselt
We present SleeD, a touch-sensitive Sleeve Display that facilitates interaction with multi-touch display walls. We discuss design implications and propose techniques for user-specific interfaces, personal views and data transfer. We verified our concepts using two prototypes, several example applications and an observational study.
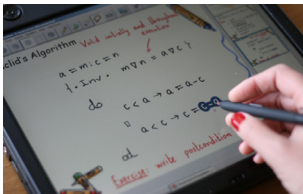

TUESDAY

COFFEE BREAK ☕

SESSION 5: CHILDREN AND LEARNING

10:50 - 12:00 *Chair: Mark Hancock • Grand Ballroom*

Structure Editing of Handwritten Mathematics - Improving the Computer Support for the Calculational Method

*Alexandra Mendes, Roland Backhouse, João F. Ferreira*

We present the first structure editor of handwritten mathematics oriented to the calculational mathematics involved in algorithmic problem solving. The editor provides features that allow reliable structure manipulation of mathematical content, including structured selection of expressions, the use of gestures to manipulate formulae, and definition/redefinition of operators in runtime.
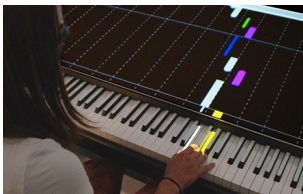
P.I.A.N.O.: Faster Piano Learning with Interactive Projection

Katja Rogers, Amrei Röhlig, Matthias Weing, Jan Gugenheimer, Bastian Könings, Melina Klepsch, Florian Schaub, Enrico Rukzio, Tina Seufert, Michael Weber

We propose P.I.A.N.O., a piano learning system with interactive projection that facilitates a fast learning process. Note information in form of an enhanced piano roll notation is directly projected onto the instrument and allows mapping of notes to piano keys without prior sight-reading skills. We report the results of two user studies, which show that P.I.A.N.O. supports faster learning.
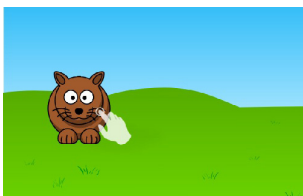
Improving Pre-Kindergarten Touch Performance (Note)

Vicente Nacher, Alejandro Catala, Javier Jaen, Elena Navarro, Pascual Gonzalez

Pre-kindergarten children have problems with double tap and long pressed gestures. We empirically test specific strategies to deal with these issues. The study shows that the implementation of these design guidelines has a positive effect on success rates, becoming feasible their inclusion in future touch based applications for pre-kindergarten children.
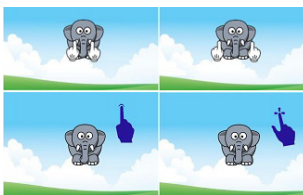
Exploring Visual Cues for Intuitive Communicability of Touch Gestures to Pre-kindergarten Children (Note)

Vicente Nacher, Alejandro Catala, Javier Jaen

In this paper, we evaluate two approaches to communicate three different touch gestures (tap, drag and scale up) to pre-kindergarten users. Our results show, firstly, that it is possible to effectively communicate them using visual cues and, secondly, that an animated semiotic approach is better than an iconic one.

LUNCH 🍴

12:00 - 14:30

GUIDED TOUR OF THE FRAUENKIRCHE (CHURCH OF OUR LADY)

13:00 - 14:00 *English and German tours (number of participants limited)*

SESSION 6: SPACE, ACTIVITIES AND WORKPLACE

14:30 - 15:30 *Chair: Katrin Wolf • Grand Ballroom*

TUESDAY

DT-DT: Top-down Human Activity Analysis for Interactive Surface Applications

Gang Hu, Derek Reilly, Mohammed Alnusayri, Ben Swinden, Qigang Gao

We present a novel human tracking and activity analysis approach using a top-down 3D camera. Our hierarchical tracking models local and global affinities, scene constraints and motion patterns to track people in space, and a novel salience occupancy pattern (SOP) is used for action recognition. We validate the tracker using two different interactive surface applications: Proximity Table and My Mother's Kitchen Exhibit.
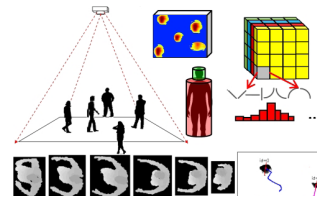
NetBoards: Investigating a Collection of Personal Noticeboard Displays in the Workplace

Erroll Wood, Peter Robinson

NetBoards are situated displays designed to fulfil and augment the role of non-digital personal noticeboards in the workplace. By replacing these with large, networked,touch-enabled displays, we replicate the existing physical systems' flexibility and ease-of-use, while enabling more expressive content creation techniques and remote connectivity.
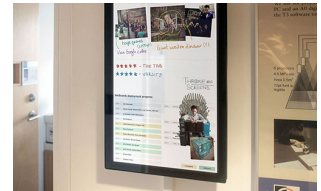
Supporting Situation Awareness in Collaborative Tabletop Systems with Automation

Y.-L. Betty Chang, Stacey D. Scott, Mark Hancock

In collaborative complex domains, while automation can help manage complex tasks and rapidly update information, operators may be unable to keep up with the dynamic changes. To improve situation awareness in co-located environments on digital tabletop computers, we developed an interactive event timeline that enables exploration of historical system events, using a collaborative digital board game as a case study.

COFFEE BREAK ☕

15:30 - 16:15

TOWNHALL MEETING

16:15 - 17:15 *Grand Ballroom*

CONFERENCE BANQUET

20:00 - 23:00 *Ballroom Lindengarten*
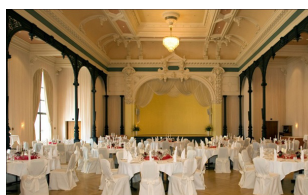
Ballroom Lindengarten
Königsbrücker Strasse 121a
01099 Dresden

Bus shuttles are organized between the Conference Venue (Hilton Hotel Dresden) and Ballroom Lindengarten (Quality Hotel Plaza Dresden). Get detailed information at the registration desk. If you prefer using public transportation, take tram 7 from „Synagoge" to „Stauffenbergallee" (six stops in direction „Weixdorf").

NOTES

TUESDAY

NOTES

SESSION 7: TOUCH, PRESSURE AND REALITY

9:30 - 10:25 *Chair: Nicolai Marquardt • Grand Ballroom*

An Empirical Characterization of Touch-Gesture Input-Force on Mobile Devices
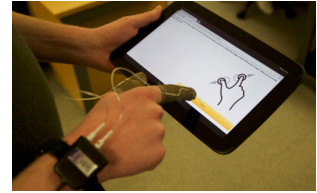
*Faisal Taher, Jason Alexander, John Hardy, Eduardo Velloso*

This paper provides a characterization of input force for common touch gestures on mobile devices. This characterization is intended to aid the design of interactive devices that integrate force-input with common touch gestures in different conditions.

Characterising the Physicality of Everyday Buttons (Note)

Jason Alexander, John Hardy, Stephen Wattam

We conducted a survey of 1515 electronic push buttons in everyday home environments. We report a characterisation that describes the features of the data set and discusses important button properties that we expect will inform the design of future physically-dynamic devices and surfaces.
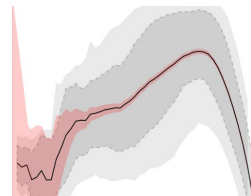
Towards Habitable Bits: Digitizing the Built Environment

Yuichiro Takeuchi

This paper identifies an emerging trend of technical research aimed at the „digitization of architectural space", and describes the range of contributions the HCI community can make in this domain. Opens up a new research field with relevance not only to HCI but also to architecture and urban design.
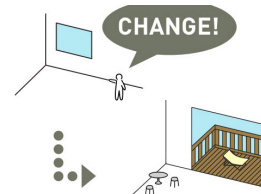
COFFEE BREAK ☕

10:25 - 11:00

WEDNESDAY

SESSION 8: IN THE WORLD

11:00 - 12:20 *Chair: Stacey Scott • Grand Ballroom*

ePlan Multi-Surface: A Multi-Surface Environment for Emergency Response Planning Exercises

Apoorve Chokshi, Teddy Seyed, Francisco Marinho Rodrigues, Frank Maurer

In collaboration with a military and emergency response simulation software company, we developed ePlan Multi-Surface, a multi-surface environment for communication and collaboration for emergency response planning exercises. We describe the domain, how it informed our prototype, and insights on collaboration, interactions and information dissemination in multi-surface environments for emergency operations centres.

Designing a Remote Video Collaboration System for Industrial Settings

*Veronika Domova, Elina Vartiainen, Marcus Englund*

This paper presents a remote collaboration system that enables a remote expert to guide a local worker during a technical support task. The system was designed for industrial settings, which introduced specific requirements for the design. To validate the applicability of the system in a real setting, we conducted a user study with operators and field workers that used the system in their working environment in a water treatment plant.

The Usability of a Tabletop Application for Neuro-Rehabilitation from Therapists' Point of View

Mirjam Augstein, Thomas Neumayr, Irene Schacherl-Hofer

This paper describes a study that has been conducted to evaluate selected fun.tast.tisch. (a tabletop system for neuro-rehabilitation) modules. The target group usually involves patients (most of them incurred acquired brain injury) and therapists. The study described here focuses on the usability of the system from therapists' point of view.
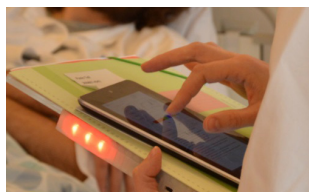
HyPR Device: Mobile Support for Hybrid Patient Records

Steven Houben, Mads Frost, Jakob E. Bardram

The Hybrid Patient Record (HyPR) consists of a paper record, tablet to access the digital record and a mobile mediating sensing platform (HyPR Device) that supports pairing of the tablet and the paper record using proximity sensing, and augments the record with a notification system (color and sound) and indoor location tracking. We report on the user-centered design process and medical simulation in which the HyPR was tested by 8 clinicians.

LUNCH 🍴

HISTORICAL EXPERIENCE TOUR THROUGH THE CITY CENTER

13:00 - 14:00 *Walking tour, English (number of participants limited)*

SESSION 9: TANGIBLES

14:00 - 14:55 *Chair: Martin Kaltenbrunner • Grand Ballroom*

ACTO: A Modular Actuated Tangible User Interface Object

Emanuel Vonach, Georg Gerstweiler, Hannes Kaufmann

ACTO is a customizable, reusable actuated tangible user interface object. Its modular design allows quick adaptations for different tabletop scenarios, making otherwise integral parts like the actuation mechanism or the physical configuration interchangeable. This qualifies it as an ideal research and education platform for tangible user interfaces.

BullsEye: High-Precision Fiducial Tracking for Table-based Tangible Interaction

Clemens N Klokmose, Janus B Kristensen, Rolf Bagge, Kim Halskov

BullsEye improves the precision of optical fiducial tracking on tangible tabletops to sub-pixel accuracy down to a tenth of a pixel. Techniques include a fiducial design for GPU based tracking, calibration of light that allows for computation on a greyscale image, and an automated technique for optical distortion compensation.

An Interaction Model for Grasp-Aware Tangibles on Interactive Surfaces (Note)

Simon Voelker, Christian Corsten, Nur Al-huda Hamdan, Kjell Ivar Øvergård, Jan Borchers

Tangibles on interactive surfaces enable users to physically manipulate digital content by placing, manipulating, or removing a tangible object. However, the information whether and how a user grasps these objects has not been mapped out for tangibles on interactive surfaces so far. Based on Buxton's Three-State Model for graphical input, we present an interaction model that describes input on tangibles that are aware of the user's grasp.
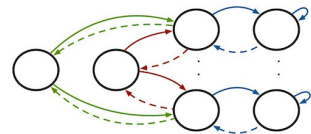
COFFEE BREAK ☕

14:55 - 15:30

NOTES

CLOSING KEYNOTE BY JOACHIM SAUTER

15:30 - 16:30 *Grand Ballroom*   *University of the Arts, Berlin • ART+COM*

Sensitive Skins in Media Art and Design

Abstract

After the spread of personal computers in the mid 1980ies, media art and design focussed primarily on the screen as an interface for nearly two decades. In order to overcome the limitation of the screen as a small rectangular, flat, single-user device, ART+COM developed touch-sensitive surfaces applicable to objects of almost any size and form in the early years of the new century. When encountering these new interfaces in exhibitions and in the museum, the audience accepted them emphatically. Instead of being faced with some wall projection with a classic single-user input interface as usual, visitors were enabled to explore content together and interact with each other.

The first touch-sensitive tables Behind The Lines (2003) and floating.numbes (2004) for the Jewish Museum in Berlin turned users into interactive participants who could jointly explore the data surface and discuss what they had discovered. The installations' implicit form of a table encouraged users to interact with each other - after all, tables have served as places of communication and exchange throughout human history. Driven by the success of this multi-user, face-to-face experience ART+COM developed dozens of content and context specific installations ranging from large, rectangular tables to amorphous touch-sensitive sculptures. The talk will discuss the history of installations and spaces using dynamic sensitive surfaces including sensitive tables, sculptures, floors, costumes and architecture and spanning from ART+COMs pre- to post-sensitive-surface era.

Biography

After graduating from the academy of fine arts in Berlin, Joachim Sauter studied at the ‚German Academy for Film and Television', Berlin. Since the early 1980s, he has been working as a media artist and designer. From the beginning, Joachim Sauter has focussed on digital technologies and is experimenting how they can be used to express content, form, and narration. Fuelled by this interest, he founded ART+COM in 1988 together with other artists, designers, scientists and technologists. Their goal was to practically research this new up-and-coming medium in the realm of art and design. Until now, he is leading this interdisciplinary group.

In the course of his work he was invited to participate on many exhibitions. Beside others he showed his work at ‚Centre Pompidou' Paris, ‚Stejdilik Museum' Amsterdam, ‚Museum for Contemporary Art' Sidney, ‚Deichtorhallen Hamburg', Kunsthalle Wien, ‚Venice Biennial',‚ICC' Tokyo, ‚Getty Center' Los Angeles, MAXXI Rom. He received several awards like the ‚Golden Lion, Cannes', the ‚D&AD Black Pencil', the ‚Ars Electronica Interactive Award', the ‚British Academy for Film and Television Interactive Award', ADC New York and ADC Germany Gold, the ‚Grand Clio', the ‚Red Dot Grand Prix', the „Designaward of the Federal Republic of Germany" and many other national and international awards'.

Since 1991 he is full professor for „New Media Art and Design" at the ‚University of the Arts' Berlin and since 2001 adjunct professor at UCLA, Los Angeles.

WEDNESDAY

NOTES

CONFERENCE ORGANIZATION

General Chairs: Raimund Dachselt *(Technische Universität Dresden, Germany)*
Nicholas Graham *(Queen's University, Canada)*

Program Chairs: Kasper Hornbæk *(University of Copenhagen, Denmark)*
Miguel Nacenta *(University of St. Andrews, UK)*

Posters Chairs: Petra Isenberg *(INRIA, France)*
Johannes Schöning *(University of Hasselt, Belgium)*

Demos Chairs: Christophe Bortolaso *(Queen's University, Canada)*
Ulrich von Zadow *(Technische Universität Dresden, Germany)*

Doctoral Symposium Chairs: Mark Hancock *(University of Waterloo, Canada)*
Jürgen Steimle *(MPI Saarbrücken, Germany)*

**Tutorials, Workshops
and Studios Chairs:** Kentaro Fukuchi *(Meiji University, Japan)*
Nicolai Marquardt *(University College London, UK)*

Proceedings Chair: Fabrice Matulic *(Technische Universität Dresden, Germany)*

Local Arrangements Chairs: Ramona Behling *(Technische Universität Dresden, Germany)*
Ricardo Langner *(Technische Universität Dresden, Germany)*

Student Volunteers Chairs: Y.-L. Betty Chang *(University of Waterloo, Canada)*
Ulrike Kister *(Technische Universität Dresden, Germany)*

Sponsor Chair: Stacey Scott *(University of Waterloo, Canada)*

Industry Chairs: David Smith *(Clemson University, USA)*
Edward Tse *(SMART Technologies, Canada)*

Web Chairs: Annett Mitschick *(Technische Universität Dresden, Germany)*
André Viergutz *(Technische Universität Dresden, Germany)*

Publicity Chair: Aaron Genest *(Solido Design Automation, Canada)*

Madness Chair: Roman Rädle *(University of Konstanz, Germany)*

Mobile Chairs: Eiji Hayashi *(Carnegie Mellon University, USA)*
Stephen Oney *(Carnegie Mellon University, USA)*
Jason Wiese *(Carnegie Mellon University, USA)*

Steering Committee: Chair: Chia Shen *(Harvard University, USA)*
Sheelagh Carpendale *(University of Calgary, Canada)*
Shahram Izadi *(Microsoft Research, UK)*
Gerald Morrison *(SMART Technologies, Canada)*
Miguel Nacenta *(University of St. Andrews, UK)*
Siram Subramanian *(Bristol University, USA)*
Andy Wilson *(Microsoft Research, USA)*

Program Committee: Jason Alexander *(University of Lancaster, UK)*
François Berard *(Grenoble Institute of Technology, France)*
Gilles Bailly *(TELECOM ParisTech, France)*
Andy Crabtree *(University of Nottingham, UK)*
Florian Echtler *(University of Regensburg, Germany)*
Carl Gutwin *(University of Saskatchewan, Canada)*
Mark Hancock *(University of Waterloo, Canada)*
Ken Hinckley *(Microsoft Research, USA)*
Uta Hinrichs *(University of St Andrews, UK)*
Eve Hoggan *(HIIT, Aalto University, Finland)*
Jonathan Hook *(University of Newcastle, UK)*
Tommi Ilmonen *(Multitouch, Finland)*
Petra Isenberg *(INRIA, France)*
Yuichi Itoh *(University of Osaka, Japan)*
Giulio Jacucci *(University of Helsinki, Finland)*
Mikkel Jakobsen *(University of Copenhagen, Denmark)*
Yvonne Jansen *(INRIA, France)*
Ian Joscelyne *(Promethean, UK)*
Nicolai Marquardt *(University College London, UK)*
Paul Marshall *(University College London, UK)*
Frank Maurer *(University of Calgary, Canada)*
Emma Mercier *(University of Illinois, USA)*
Mathieu Nancel *(University of Canterbury, New Zealand)*
Esben W. Pedersen *(University of Copenhagen, Denmark)*
Johannes Schöning *(Hasselt University, Belgium)*
Stacey Scott *(University of Waterloo, Canada)*
David Smith *(Clemson University, USA)*
Jürgen Steimle *(Saarland University, Germany)*
Bruce Thomas *(University of South Australia, Australia)*
Melanie Tory *(University of Victoria, Canada)*
Edward Tse *(SMART Technologies, Canada)*
Andy Wilson *(Microsoft Research, USA)*
Frederic Vernier *(Université Paris Sud, France)*
Katrin Wolf *(T-Mobile Labs Berlin, Germany)*
Shengdong Zhao *(Singapore National University, Singapore)*

AUTHORS LIST

Agotai, Doris	22
Akazawa, Teruhiko	17
Alavi, Ali	21
Alexander, Jason	37
Alnusayri, Mohammed	33
André, Elisabeth	23
Anslow, Craig	10, 18
Asai, Hiroki	21
Augsburg, Anton	27
Augstein, Mirjam	29, 38
Backhouse, Roland	32
Badam, Sriram Karthik	31
Bagge, Rolf	28, 39
Bardram, Jakob E.	31, 38
Baudisch, Patrick	10, 28
Besacier, Guillaume	31
Borchers, Jan	39
Bortolaso, Christophe	18
Brochet, Gilles	22
Brockmeyer, Eric	17
Büschel, Wolfgang	31
Butscher, Simon	12
Caballero, Daniela	21, 22
Campos, Miguel	21
Campos, Pedro	10, 21
Carpendale, Sheelagh	24
Caspar, David	18
Catala, Alejandro	32
Chang, Y.-L. Betty	33
Cheung, Victor	12, 23
Chokshi, Apoorve	38
Cirelli, Mauricio	17
Corsten, Christian	39
Dachselt, Raimund	3, 21, 22, 27, 31
Dang, Chi Tai	23
Dillenbourg, Pierre	21, 22
Domova, Veronika	38
Echtler, Florian	11, 21, 27
Eibl, Maximilian	28
Elmqvist, Niklas	31
Englund, Marcus	38
Eom, Young Ik	28
Ferreira, Alfredo	10, 24

Ferreira, João F.	32
Fischbach, Martin	27
Fraas, Claudia	28
Franke, Ingmar	28
Freitas, Paulo	21
Frost, Mads	38
Gao, Qigang	33
Gehring, Sven	27
George, Sebastien	22
Gerstweiler, Georg	39
Gonçalves, Frederica	21
Gonzalez, Pascual	32
Götzelmann, Timo	23
Goyal, Nippun	31
Graham, Nicholas	3, 18
Grijincu, Daniela	16
Groh, Rainer	28
Gros, Peter	22
Gründer, Thomas	28
Gugenheimer, Jan	20, 28, 32
Gutwin, Carl	18
Haas, Benedikt	21
Haller, Michael	31
Halskov, Kim	28, 39
Hamdan, Nur Al-huda	39
Hancock, Mark	16, 23, 33
Hardy, John	37
Heckel, Marcel	21
Hirano, Hiromi	20
Holz, Christian	28
Horak, Tom	22
Hornbæk, Kasper	3
Hoshino, Junichi	20
Houben, Steven	31, 38
Hu, Gang	33
Huber, Alexander	16
Ion, Alexandra	10
Ishiguro, Yoshio	17
Israr, Ali	17
Jaen, Javier	32
Jetter, Hans-Christian	17, 27
Jin, Yucheng	23
Jorge, Joaquim	24

AUTHORS LIST (CONTINUED)

NOTES

Devrient-straße

Kleine Packhof-straße

Ostrauer

Bernhard-von-Lindenau-Platz

Am Zwingerteich

Terrassenufer

Neustädter Markt

nur Linie 8

Köpckestraße

Sarrassani-straße

Carola-platz

Wigard-

Archivstr.

Buckstr.

straße

Königsufer

Wiesentor-straße

Carolabrücke

DIRECTION TO LINDEN-GARTEN

11

Theater-platz

Schloß-platz

Brühlsche

Terrasse

Terrassenufer

Brühlscher Garten

1 Augustusstraße
2 Brühlsche Gasse
3 Terrassengasse
4 Töpfergasse   7 Georg-Treu-Platz
5 Münzgasse   8 Tzschirnerplatz
6 An der Frauenkirche

Hasenberg

Steinweg

Ziegelstraße

Tram SYNAGOGE

Rathenau-platz

Pillnitze

94

Postplatz

Sophien-str.

Taschen-berg

Kanzlei-gäßchen Sporer-gasse

Kleine Brüdergasse

Wilsdruffer

Schloßstr.

PULVER-TURM

Salzgasse

Rampische Str.

Schießgasse

Landhaus-

Galeriestr.

Neumarkt

Kleine Kirch-gasse

Friesen-gasse

Straße

Moritzburger Straße

62

62

7

3

1 2 12

Scheffelgasse

1 2 4

Tuchmacher-gasse

Altmarkt

Weiße Gasse

Kreuz-

Gewand-haus-straße

Ringstraße

str.

1 2 4

Pirnaischer Platz

Grunaer

12

1 2 4 12

Antons-platz

Marienstraße

Webergasse

Seestraße

1
3
5

4
6

Rathaus-platz

str.

82 St. Peters-

75

Pirnaische

Zirkusstraße

Seidnitzer

Straße

Lingnerallee

BUS

Zahns-gasse

Dr.-Külz- 11 12

Ring

12

1 Kramergasse
2 An der Mauer
3 Schreibergasse
4 An der Kreuzkirche
5 Pfarrgasse
6 Schulgasse

Dippoldis-walder Platz

Waisenhausstraße 62

62

Victoria-str.

Georg-platz

St. Peters-

75

Zinzendorfstraße

Blüher-

Lingner-platz

Vitzthumstraße

Trompeter-str.

Ferdinand-platz

Ferdinand-

WC

Prager

St. Petersburger

Räcknitz-

Walpurgis-

Str.

Mosczinskystraße

Hans-

Struvestraße

Dankner-gasse

Linden-

straße

Wigman-Straße D.-Hoyer-Str.

Bürger-

Bürger-wiese 75

Blüher-

Lingner

Helmut-Schön-Al

Antons-platz

Große Nauensche Straße

Feldgasse

Reitbahn-

straße

St. Petersburger

Sidonienstraße

66

Wiener Platz

Dresden Hauptbahnhof

Zug S WC

WC 10

Wiener Platz

1

3 8

9 10 11

9 10 11

ITS 2014

Booklet created by:

Konstantin Klamka
Ricardo Langner
André Viergutz