Special Interest Group Touching The 3rd Dimension (T3D)

Frank Steinicke
Visualization and Computer Graphics Research Group
Einsteinstr. 62, 48149 Münster, Germany
fsteini@uni-muenster.de

Hrvoje Benko
Adaptive Systems and Interaction, Microsoft Research
One Microsoft Way, Redmond WA 98052-6399, USA
benko@microsoft.com

Florian Daiber
Intelligent User Interfaces, DFKI GmbH
Stuhlsatzenhausweg 3, 66123 Saarbrücken, Germany
florian.daiber@dfki.de

Daniel Keefe
University of Minnesota, USA
200 Union Street SE, Minneapolis, MN 55455, USA
keefe@cs.umn.edu

Jean-Baptiste de la Rivière
IMMERSION SAS
12 Rue Feaugas, 33100 Bordeaux, France
jb.delariviere@immersion.fr

CHI 2011, May 7–12, 2011, Vancouver, BC, Canada.
ACM 978-1-4503-0268-5/11/05.

Abstract
In recent years interactive visualization of 3D data has become important and widespread due to the requirements of several application areas. However, current user interfaces often lack adequate support for 3D interactions: 2D desktop systems are often limited in cases where natural interaction with 3D content is required, and 3D user interfaces consisting of stereoscopic projections and tracked input devices are rarely adopted by ordinary users. Touch interaction has received considerable attention for 2D interfaces, and more recently for 3D interfaces. Many touch devices now support multiple degrees of freedom input by capturing multiple 2D contact positions on the surface as well as varying levels of pressure and even depth. There is great potential for multi-touch interfaces to provide the traditionally difficult to achieve combination of natural 3D interaction without any instrumentation. When combined with a stereoscopic display as well as depth cameras, we believe that multi-touch technology can form the basis for a next generation of 3D user interfaces. Several research groups have begun to explore the potential, limitations, and challenges of this and other 3D touch environments, and first commercial systems are already available. The goal of the SIG "Touching the 3rd Dimension (T3D)" is to address the research and industrial challenges involved in exploring the space where the flat digital world of surface computing meets the physical, spatially complex, 3D space in which we live. The meeting will provide a common forum to attract groups of conference attendees who share their visions of the future and recent results in the area of improving 3D interaction and visualization by taking advantage of the strengths of advanced multi-touch computing.

Keywords
Multi-touch, 3D interaction, stereoscopic visualization, 3D user interfaces

ACM Classification Keywords
H.5.2 User Interfaces (D.2.2, H.1.2, I.3.6)

General Terms
Human Factors

SIG Meeting Format, Length, and Size

We plan for a 80 minutes interactive SIG meeting. The optimal size of the meeting would be about 15-30 participants.

SIG T3D Meeting Plan

The following sections give a brief outline of our plans for before the SIG meeting, at the SIG meeting, and after the meeting.

Before the SIG Meeting
A SIG T3D website will be set up containing a "*Call for Participation*", invited speakers/panelists, and additional information would be online immediately after acceptance notification. The call for participation will be circulated widely to potential interested communities ranging from 3D user interface, virtual and augmented reality, to multi-touch interaction, and perceptual computer graphics and human-computer interaction. In addition, the organizers will contact further representatives from various countries, from both the academic and industrial domains, as well as from the HCI, 3DUI, virtual reality and perception communities. We encourage all potential participants to briefly present their projects related to 3D and multi-touch in a Wiki at our web page. The organizers will select certain projects to be introduced or presented at the SIG meeting.

Before the meeting, we will initiate a survey among potential participants in which open questions and future research directions in this field will be identified. We plan to submit the results as a poster to HCI and discuss selected topics during the meeting and the poster presentation.

At the Meeting
We expect participation by scientists, designers and manufactures and others working in several areas of HCI addressing the associated research questions, such as design and manufacturing of stereoscopic touch surfaces, 3D interaction techniques, evaluation methodologies, social impact, collaborative scenarios, and emerging application areas.

At the beginning of the meeting (after the introduction), the principal investigators (PIs) selected or invited by the organizers will briefly introduce their projects and visions in 5 minutes slots. Some of persons of the "Tentative List of Participants" (see below) already agreed to introduce their projects, e.g., iMUTS, Microsoft Kinect or InSTInCT.

Afterwards, a 30 minutes panel discussion including these PIs will be held in which some of the questions collected before the meeting will be interactively discussed among the participants.

At the end of the meeting, the organizers will announce the planned upcoming events for the SIG T3D. Currently, the organizers prepare a proposal for Dagstuhl seminar (http://www.dagstuhl.de/) as well as for a T3D workshop.

Finally, participants will receive flyers with information regarding the T3D web page, mailing list and upcoming related events such as conferences or other meetings.

After the Meeting
The SIG T3D meeting will be publicized and documented on the T3D web page and on platforms such as Twitter, Facebook, Flickr, and Slideshare. We plan to publish the slides of the presentations at the SIG web page.

Organizers' Backgrounds

Hrvoje Benko is a senior researcher at Adaptive Systems and Interaction at Microsoft Research. His research is on novel surface computing technologies and their impact on human-computer interaction. Hrvoje Benko received his PhD at Columbia University, working on augmented reality projects that combine immersive experiences with interactive tabletops. His projects explore new form factors for surface computing, multi-touch and freehand gestural input, 2D and 3D interactions, and augmented reality. Dr. Benko serves on the program committees for ACM UIST 2010, ACM ITS 2010, ICMI-MLMI 2010 and IEEE 3DUI 2010.

Florian Daiber is a researcher at the German Research Center for Artificial Intelligence (DFKI). From 2008-2009 he worked at the Institute or Geoinformatics at the University of Münster. His research interests are intelligent user interfaces with special consideration of multi-touch interaction. Since 2010 Florian Daiber is member of DFKI and mainly involved in the *interscopic Mult-touch Surfaces* (iMUTS)-project.

Daniel Keefe is an assistant professor in the Department of Computer Science and Engineering at the University of Minnesota. His research explores novel computer graphics and interactive techniques for multidimensional datasets. His current projects include medical device simulation and design, surgical training, experimental biomechanics, virtual archeology, and visual art. He has served on program committees for leading conferences in his field. He received the Ph.D. in computer science from Brown University in 2007, where his work was nominated for the ACM Doctoral Dissertation Award.

Jean-Baptiste de la Rivière is head of the Immersion Research and Development team. He received his Ph.D. in Computer Science from the University of Bordeaux (2005). His research interests include interaction with and visualization of 3D environments, and he explores how those topics can benefit from the strengths of technologies such as tactile input. As a company, Immersion team is dedicated to develop relevant 3D visualization and interaction techniques. Jean-Baptiste is an active member of the national research projects selection committee, and his team is taking part in many major French and European collaborative research projects.

Frank Steinicke is a private lecturer and senior researcher at the Department of Computer Science at the University of Münster. He received his PhD (2006) in computer science from the University of Münster. Frank Steinicke is a member of several International Program Committees and organizer of tutorials and workshops at different major virtual reality events. He is a principal investigator of several international research grants including the interdisciplinary iMUTS-project funded by the German Research Foundation.

Tentative List of Participants

The following persons expressed their interest in participating the planned SIG meeting.

- Hrvoje Benko, Microsoft Research, USA
- Gerd Bruder, University of Münster, GER
- Raimund Dachselt, University of Magdeburg, Germany)
- Florian Daiber, DFKI Saarbrücken, Germany
- Jean-Baptiste de la Rivière, IMMERSION SAS, France
- Daniel Keefe, University of Minnesota, USA
- Frank Steinicke, University of Münster, Germany
- Patrick Baudisch, Hasso Plattner Institute, GER
- Géry Casiez, INRIA at Villeneuve, FRA
- Laurent Grisoni, University Lille, FRA
- Martin Hachet, INRIA at Bordeaux, FRA
- Otmar Hilliges, Microsoft Research, UK
- Antonio Krüger, DFKI Saarbrücken, GER
- Anthony Martinet, INRIA at Villeneuve, FRA
- Johannes Schöning, DFKI Saarbrücken, GER
- Dimitar Valkov, University of Münster, GER
- Lode Vanacken, Hasselt University, BEL
- Yon Visell, McGill University, CA
- Andy Wilson, Microsoft Research, USA