

New Directions in 3D User Interfaces

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1 WORKSHOP SUMMARY

This workshop focuses on novel research in three-dimensional user interfaces (3D UIs). The workshop builds on and expands the scope of last year's workshop "Beyond Wand and Glove Based Interaction." The theme of the workshop will again be on moving beyond the "common" and "traditional" (if one can use those words with respect to such a young research area) approaches to 3D UIs.

Just as wands, 3D mice, and gloves became traditional input devices for 3D UIs, a handful of well-known interaction techniques and UI metaphors also became de facto standards (often because they were the default interaction techniques in widely-used software toolkits). Most of these basic techniques, however, have been around for 5-10 years. Although this could certainly change, it seems that the discovery of radical new metaphors for the "universal 3D tasks" (navigation, selection, manipulation, system control) has slowed down significantly. This does not mean, however, that we should stop doing research on interaction techniques for these tasks. Rather, it means we have to improve the existing metaphors in subtle ways, experiment with the use of new devices, and consider the use of such techniques in specific domains or by specific types of users. Recent research has shown that there is still much to be learned in this area, and that current techniques can be enhanced to dramatically improve usability.

In this workshop, we will spotlight research that investigates novel and enhanced methods of 3D interaction for immersive virtual environments (VEs), augmented and mixed reality (AR/MR), and desktop 3D systems. Relevant topics include:

- 3D input devices
- 3D display devices
- 3D interaction techniques
- 3D user interface metaphors
- collaborative 3D interaction
- evaluation methods for 3D UIs
- application of existing devices/techniques in novel contexts (e.g. to AR, UbiComp, etc.)
- migration of existing techniques to new display platforms

2 ORGANIZERS

Doug Bowman is an Assistant Professor of Computer Science at Virginia Tech. He received his M.S. and Ph.D. degrees from the Georgia Institute of Technology in 1997 and 1999, respectively, and joined the faculty at Virginia Tech soon thereafter. His research interests are in the design, evaluation, and application of 3D User Interfaces (3D UIs). In 2003, he received a prestigious CAREER award from the National Science Foundation. He recently authored, with three colleagues, the book "3D User Interfaces: Theory and Practice" (Addison-Wesley, 2004). He is the co-founder of the 3DUI mailing list and the Virginia Tech Virtual Environments Research Group. He is affiliated with the

Center for Human-Computer Interaction and the University Visualization and Animation Group at Virginia Tech.

Bernd Froehlich is a professor for Virtual Reality Systems with the Media Faculty at the Bauhaus University Weimar in Germany. From 1997 to March 2001 he was the Coordinator for Scientific Visualization projects at the German National Research Center for Information Technology (GMD). From 1995 to 1997 he worked as a Research Associate with the Computer Graphics group at Stanford University. From 1993 to 1995 Dr Froehlich headed the Responsive Workbench project at GMD. He received his Masters in Science and Doctor of Philosophy in Computer Science, from the Technical University of Braunschweig in Germany in 1988 and 1992, respectively. His recent work focuses on input devices, interaction techniques, display systems, and support for tight collaboration in local and distributed virtual environments.

Yoshifumi Kitamura was born in Osaka, Japan on July 1962. He received the B.Sc., M.Sc. and Ph.D. degrees in Engineering from Osaka University in 1985, 1987 and 1996, respectively. From 1987 to 1992, he was at the Information Systems Research Center of Canon Inc., where he was involved in research on artificial intelligence, image processing, computer vision, and 3-D data processing. From 1992 to 1996, he was a researcher at ATR Communication Systems Research Laboratories, where he worked on sophisticated user interface in virtual environments. From 1997 to 2002, he was an Associate Professor at Graduate School of Engineering, Osaka University. From April 2002, he is currently an Associate Professor at Graduate School of Information Science and Technology, Osaka University. His current research interests include 3-D user interfaces that utilize the user's intuition, sensitivity, and proprioception to the full.

Wolfgang Stuerzlinger graduated from the Technical University in Vienna, Austria in 1993. Then he moved to the University of Linz, Austria. In 1997 and supported by an Erwin-Schrödinger fellowship Dr. Stuerzlinger visited the Department of Computer Science at the University of North Carolina in Chapel Hill (hosted by Prof. F. Brooks). In 1998, Dr. Stuerzlinger was appointed to the Department of Computer Science at York University in Toronto, Canada. There, he is an associate professor and a member of the interdisciplinary Centre for Vision Research (CVR). At York University, Dr. Stuerzlinger performs research in virtual reality, human-computer interaction, and computer graphics. In general, his research aims to find innovative solutions for real-world problems and is often cross-disciplinary. Current research projects include better user interfaces for two and three-dimensional design applications, novel user interfaces for text entry and pen-computing, and a novel kind of display system that can display very vivid images. Dr. Stuerzlinger has published more than 40 refereed scientific publications and supervised more than 20 graduate students to completion.