How to Make Augmented Reality User Interfaces Work

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Abstracts

Augment Reality has been in existence for a number of decades, but we still do not have a set of solid user interface technologies. There have many great innovations into user interfaces for AR, but these have not translated into a pervasive user interface paradigm. The classic question is: "Why does AR not have the equivalent to the WIMP for desktop computers?" This talk will examine what is great and lacking in the current state-of-the-art for AR user interfaces. More importantly the talk will explore what we can do to make AR user interfaces that people will want to use. Many of these activities we can start doing today as the Mixed and Augmented Reality community.

Biography

Professor Thomas is the current the Director of the Wearable Computer Laboratory at the University of South Australia. He is currently a NICTA Fellow, CTO A-Rage Pty Ltd, and visiting Scholar with the Human Interaction Technology Laboratory, University of Washington. Prof. Thomas is the inventor of the first outdoor augmented reality game ARQuake. His current research interests include: wearable computers, user interfaces, augmented reality, virtual reality, CSCW, and tabletop display interfaces.

Prof. Thomas' academic qualifications include the following:
1) B.A. in Physics, George Washington University;
2) M.S. in Computer Science, University of Virginia with a thesis titled:
Pipeline Pyramids in Dynamic Scenes; and
3) Ph.D. in Computer Science, Flinders University with a thesis titled:
Animating Direct Manipulation in Human Computer Interfaces

His experience includes working at the School of Computer and Information Science, University of South Australia since 1990. He has run his own computer consultancy company. He was a Computer Scientist at the National Institute of Standards and Technology (A major US government aboratory for the Department of Commerce.), and a software engineer for the Computer Sciences Corporation and the General Electric Company.

Natural user interfaces for collaborative environments

Michael Haller Ph.D, Professor
Media Interaction Lab, Department of Digital Media
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Abstracts

Until recently, the limitations of display and interface technologies have restricted the potential for human interaction and collaboration with computers. For example, desktop computer style interfaces have not translated well to mobile devices and static display technologies. However, the emergence of interactive whiteboards has pointed to new possibilities for using display technology for interaction and collaboration. A range of emerging technologies and applications could enable more natural and human centered interfaces so that interacting with computers and content becomes more intuitive. This will be important as computing moves from the desktop to being embedded in objects, devices and locations around us and as our "desktop" and data are no longer device-dependent but follow us across multiple platforms and locations. The impact of Apple's iPhone and an increasing number of multi-touch surfaces show that users' expectations about using these devices in their daily lives have increased. The reaction to these natural interface implementations has been very dramatic. With the increasing development of interactive walls, interactive tables, and multi-touch devices, both companies and academics are evaluating their potential for wider use. These newly emerging form factors require novel human-computer interaction techniques which will be discussed in this presentation. My research goal is to design, develop, and evaluate natural user interfaces that will enable everyone, not just experts, to use our interactive surfaces. In this presentation, we will describe particular challenges and solutions for the design of tabletop and interactive wall environments and present the user-centered design.

Biography

Michael Haller is working at the department of Digital Media of the Upper Austria University of Applied Sciences (Hagenberg, Austria), head of the Media Interaction Lab, and responsible for computer graphics, multimedia programming, and augmented reality. He received Dipl.-Ing. (1997), Dr. techn. (2001) and Habilitation (2007) degrees from Johannes Kepler University of Linz. He is active in several research areas, including interactive computer graphics, augmented and virtual reality, and human computer interfaces. In 2004, he received the Erwin Schroedinger fellowship award presented by the Austrian Science Fund.

Haptics of Humans and Robots

-Analysis of tactile sensation of humans and development of tactile sensors/displays

Takashi Maeno Ph.D., Professor
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Abstracts

Technologies on tactile sensation have not been progressed compared with visual and oral technologies. For example, perpendicular axes representing the fundamental characteristics of tactile sensation has not been clarified. Role of main four mechanoreceptors underneath the skin for texture perception has not been clarified as well. Hence, the presenter have been involved in the research on mechanical characteristics of human skin and its relationship to tactile perception as well as the psychological analysis of humans touching various surface of objects. As a result relationship between humans' texture perception and physical properties has been clarified. The presenter is also involved in the development of tactile sensors and tactile displays. Examples of those sensors/displays are shown. Tactile sensors are for detecting texture of surface of objects. They can be used both for device for industry to quantify the texture of products and for humanoid robots. Tactile displays are for presenting texture, softness and friction of various objects to human fingers. The tactile displays are realized by using amplitude modulation of ultrasonic vibration of Langevin type vibrator as well as force feedback using force display. I hope those technologies are useful for progress of haptic technologies in the field of virtual reality and robotics.

Biography

Takashi Maeno received his B. S. and M. S. degrees in mechanical engineering from the Tokyo Institute of Technology, Tokyo, Japan, in 1984 and 1986, respectively. From 1986 to 1995, he worked for Canon, Inc., in Tokyo, Japan. He received his Ph. D. degree in mechanical engineering from the Tokyo Institute of Technology, Tokyo, Japan, in 1993. Since 1995, he has been with Keio University, Yokohama, Japan, where he is currently a Professor. He was a Visiting Industrial Fellow at the University of California, Berkeley, from 1990 to 1992. He was a visiting professor at Harvard University in 2001 as well. His research interests are on tactile sensors/displays, recognition of robots/humans and large scale complex system design.

Haptics and Pseudo-Haptics: from Reserach to Industry

Sabine Coquillart Ph.D
Research director at INRIA and LIG

Abstracts

This talk will start by extending the presentation I gave at ICAT'2002. In 2002, I presented a new first-person projection-based visuo-haptic environment named the "Stringed Haptic Workbench". This talk will present applications developped thanks to this environment, including one in use in the industry. New trends in pseudo-haptics as well as recent applications will also be presented.

Biography

Sabine Coquillart is a research director at INRIA (the French National Institute for Research in Computer Science and Control) and LIG (the Laboratory of Informatics of Grenoble). Her research interests include VR and 3D user interfaces. Coquillart received her PhD in computer science from Grenoble University and a research-supervising Habilitation from the University of Paris XI. Contact her at sabine.coquillart@inria.fr.