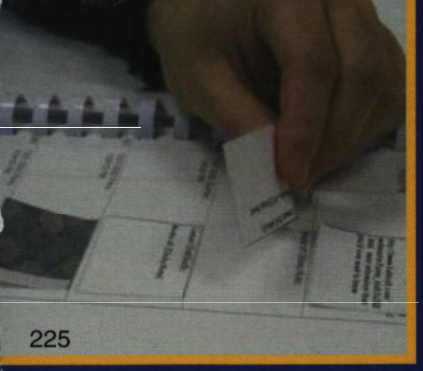

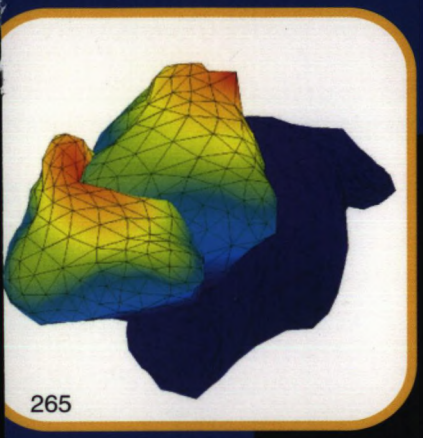

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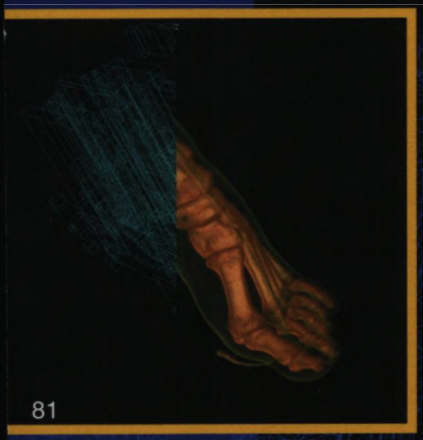

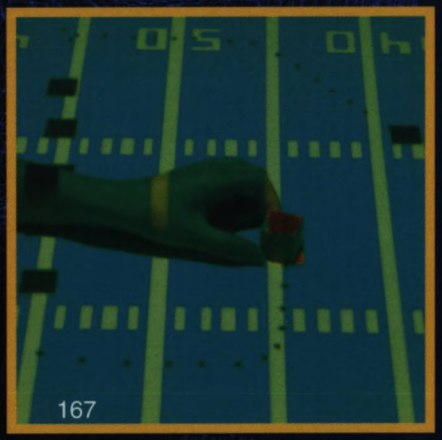

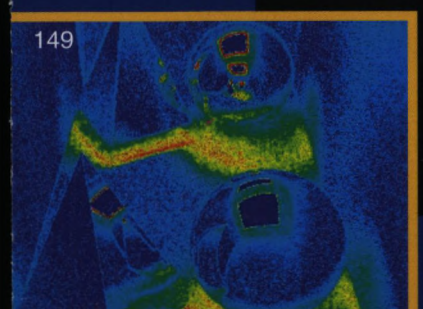

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Graphics **Interface** 2003

Torsten Möller and Colin Ware
Program Co-Chairs

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Halifax, Nova Scotia
11–13 June 2003

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Message from the Program Co-Chairs

Torsten Möller
Graphics, Usability, and Visualization (GrUVi) Lab
School of Computing Science
Simon Fraser University

Colin Ware
Data Visualization Research Lab
Center for Coastal and Ocean Mapping
University of New Hampshire

Welcome to Graphics Interface (GI) 2003, a conference that combines coverage of original research results in both Human-Computer Interaction and Graphics. The conference took place in Halifax, Nova Scotia, over 11–13 June 2003, and was held in conjunction with the Artificial Intelligence 2003 and Vision Interface 2003 conferences. GI 2003 is the 29^{th} instance of the longest running conference series in human-computer interaction and computer graphics. This event has previously been held in Halifax in 1990.

We set out this year to enhance the human-computer interaction side of GI with the goal of putting Graphics Interface on the map as an important place to publish in HCI. Whether it is by chance, or through our efforts, we are happy to say that we were able to increase the number of HCI submissions to forty-three (plus a number that combined graphics and interaction). Out of these we have accepted fourteen, almost doubling the number of HCI papers that were accepted over 2002. We believe that at the same time we have maintained a high standard of quality.

While the submissions to the human-computer interaction side of GI increased, the graphics side didn't suffer. Out of fifty-three very strong graphics submissions we were able to select eighteen papers, just as many as in 2002.

The program committee consisted of seventeen experts from around the world. Each paper received at least four reviews, two of which were from members of the program committee. The reviewing process was double-blind: the identity of the authors was known only to program co-chairs and the program committee member responsible for choosing external reviewers for each submission. The program committee members were usually able to solicit reviews from some of the topmost experts in the particular areas of research relevant to each individual paper. We greatly appreciate the effort of the members of the program committee. We would like to extend additional thanks to the ten members of the program committee who attended the meeting at University of Toronto, Canada on 15 February 2003 and funded their own travel.

Graphics Interface customarily has several keynote speakers. This year's four keynote speakers were: Randy Pausch, Associate Professor of Computer Science at the University of Virginia; Christopher Johnson, Professor of Computer Science at the University of Utah; Jessica Hodgins, Associate Professor of Computer Science and Robotics Carnegie Mellon University; and Stuart Card, Palo Alto Research Center (PARC). We extend our gratitude to them for sharing their inspiration in their respective fields.

We would like to thank the authors of all the papers submitted to GI 2003, as well as the program committee members and referees who volunteered their time to ensure the quality of the program. Our thanks especially go to James Stewart whose excellent conference management site made the job of managing the review process much easier than it would have otherwise been.

We would also like to thank Pierre Poulin and Kelly Booth for handling the liaison with AI and VI conference organizers, and Kelly Booth again for additional valuable advice. We thank further Daryl Hepting for handling the posters; Fred Peet, treasurer of the Canadian Human-Computer Communication Society, for keeping the finances straight; and Graphics Services at the University of Waterloo and Michael McCool for doing such an excellent job on the proceedings. Last but not least, we send a very big thanks to Kori Inkpen, Anne Publicover, Karen Parker, and Stacey Scott, for the local organization of the joint conferences at Dalhousie University. Without their work, this conference would simply not have been possible.

For further information about the conference series we invite you to visit our web site:

`http://www.graphicsinterface.org/`

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Mixing Reality

Meshes and Surfaces

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Keynote Speakers

The Interdisciplinary Challenge of Building Virtual Worlds

Randy Pausch
Co-Director, Entertainment Technology Center
Carnegie Mellon University
pausch@cmu.edu

Creating an interactive virtual reality experience is a one of the hardest authoring challenges in human history. Success requires talent from computer science, engineering, art, drama, design, architecture, and a host of other disciplines.

I have worked with Walt Disney Imagineering on several virtual reality projects for the DisneyQuest "digital theme park" in Orlando. Meanwhile, Carnegie Mellon has created the Entertainment Technology Center (ETC; etc.cmu.edu), a joint initiative between Schools of Computer Science and the College of Fine Arts. As part of the ETC efforts, we have developed the Alice 3D authoring tool (www.alice.org) and processes that allow interdisciplinary teams to create compelling virtual worlds in a two-week time period. I will discuss the "Building Virtual Worlds" course, the Alice system, and the mechanisms we use to put students together from different fields effectively.

Biography

Randy Pausch is a Professor of Computer Science, Human-Computer Interaction, and Design at Carnegie Mellon, where he is the co-director of CMU's Entertainment Technology Center (ETC). He was a National Science Foundation Presidential Young Investigator and a Lilly Foundation Teaching Fellow. He has consulted with Walt Disney Imagineering on the user interface design and testing of interactive theme park attractions, and with Google on user interface issues. Dr. Pausch is the author or co-author of five books and over 50 reviewed journal and conference proceedings articles, and he is the director of the Alice project.

Computational Multi-Field Visualization

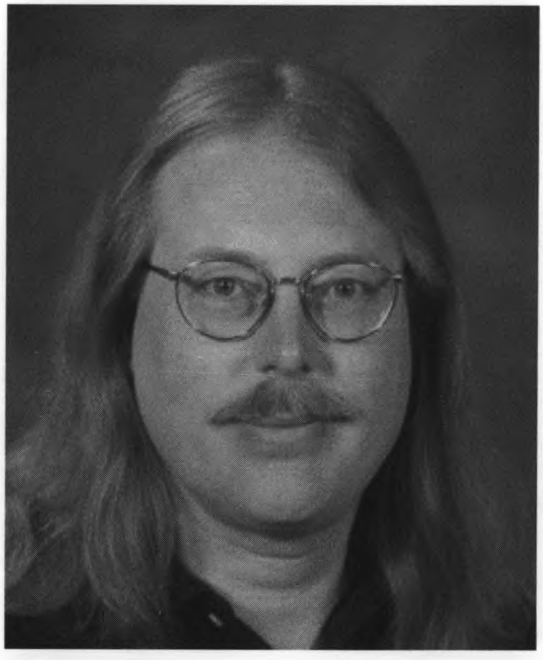
Christopher Johnson
Director
Scientific Computing and Imaging Institute
School of Computing
University of Utah
www.sci.utah.edu

Computational field problems; such as computational fluid dynamics (CFD), electromagnetic field simulation, and weather modeling—essentially any problems whose physics can be modeled effectively by ordinary and/or partial differential equations—constitute the majority of computational science and engineering simulations. The output of such simulations might be a single field variable (such as pressure or velocity) or a combination of fields involving a number of scalar fields, vector fields, and/or tensor fields. As such, scientific visualization researchers have concentrated on effective ways to visualize large-scale computational fields. Much current and previous visualization research has focused on methods and techniques for visualizing a computational field variables (such as the extraction of a single scalar field variable as an isosurface). While single variable visualization often satisfies the needs of the user, it is clear that it would also be useful to be able to effectively visualize multiple fields simultaneously.

In this talk I will describe some of our recent work in scalar, vector, and tensor visualization techniques as applied to the domain of computational field problems. I will end with a discussion of ideas for the integration of techniques for creating computational multi-field visualizations.

Biography

Professor Johnson directs the Scientific Computing and Imaging Institute at the University of Utah where he is a Professor of Computer Science and holds faculty appointments in the Departments of Physics, and Bioengineering. His research interests are in the area of scientific computing. Particular interests include inverse and imaging problems, adaptive methods, problem solving environments, large scale computational problems in medicine, and scientific visualization. Professor Johnson was awarded a Young Investigator's (FIRST) Award from the NIH in 1992, the NSF National Young Investigator (NYI) Award in 1994, and the NSF Presidential Faculty Fellow (PFF) award from President Clinton in 1995. In 1996 he received a DOE Computational Science Award and in 1997 received the Par Excellence Award from the University of Utah Alumni Association and the Presidential Teaching Scholar Award. In 1999, Professor Johnson was Awarded the Governor's Medal for Science and Technology. In 2003 he was promoted to the rank of Distinguished Professor.



Animating Human Characters

Jessica Hodgins
School of Computer Science
Carnegie Mellon University

Computer animations and virtual environments both require a controllable source of motion for their characters. Two possible solutions are simulation and motion capture and over the past 10 years, we have explored both techniques separately. For example, we developed control algorithms that allow rigid body models to run or bicycle, bounce on a trampoline, and perform a handspring vault. More recently, we have begun to use human motion data to bias planning algorithms towards more natural postures, and to construct interfaces for avatars. We have also begun to combine simulations with motion capture data in the hope that these techniques will benefit both from the physical realism of simulation and from the humanlike motion provided by captured data.

Biography

Jessica Hodgins joined the Robotics Institute and Computer Science Department at Carnegie Mellon University as a Associate Professor in fall of 2000. Prior to moving to CMU, she was an an Associate Professor and Assistant Dean in the College of Computing at Georgia Institute of Technology. She received her Ph.D. in Computer Science from Carnegie Mellon University in 1989. Her research focuses on computer graphics, animation, and robotics. She has received a NSF Young Investigator Award, a Packard Fellowship, and a Sloan Fellowship. She was editor-in-chief of ACM Transactions on Graphics from 2000–2002 and will be SIGGRAPH Papers Chair in 2003.

Beyond HCI to Human Information Interaction

Stuart Card
Palo Alto Research Center (PARC)

Humans are informavores; our ecological niche has been to be extremely good at processing and communicating. Computers are our tool par excellence to augment our information consumption and manipulation; user interfaces are the means by which we can integrate and speed our interaction with these machines. But a funny thing happened on the way to perfecting the art and science of user interfaces to computers—the computer began to disappear. In some cases this is literally true, as in the case of embedded computers, but it is also true in the sense that user interfaces in information-intensive uses are about interaction with the semantic content of the information itself and not just its form. In fact, our current notions of human-computer interaction are inadequate for thinking about how to build user interfaces in the coming information-intensive, multi-device world. I will propose some principles of a supporting science of human-information interaction that try to suggest user experience designs for information applications. I will also propose a class emerging of user interfaces.

Biography

Stuart Card is a Senior Research Fellow and the manager of the User Interface Research group at the Palo Alto Research Center. His study of input devices led to the Fitts's Law characterization of the mouse and was a major factor leading to the mouse's commercial introduction by Xerox. His group has developed theoretical characterizations of human-machine interaction, including the Model Human Processor, the GOMS theory of user interaction, information foraging theory, and statistical descriptions of Internet use. These theories have been put to use in new paradigms of human-machine interaction including the Rooms workspace manager, papertronic systems, and the Information Visualizer. The work of his group has resulted in a dozen Xerox products as well as the contributing to the founding of three software companies, Inxight Software, Outride, and Content Guard. Card is a co-author of the book *The Psychology of Human-Computer Interaction,* a co-editor of the book, *Human Performance Models for Computer-Aided Engineering*, and has served on many editorial boards, government panels, and university review boards. He received his A.B. in Physics from Oberlin College and his Ph.D. in Psychology from Carnegie Mellon University, where he pursued an interdisciplinary program in psychology, artificial intelligence, and computer science. He has been an adjunct faculty member at Stanford University. His most recent book, *Readings in Information Visualization* was published in 1999. Card is currently concentrating on the theory and design of systems for attending to and interpreting large amounts of information (information foraging theory and sensemaking theory). Card is a Fellow of the ACM, the first recipient of the ACM CHI Lifetime Achievement Award, and the first member of the ACM CHI Academy.

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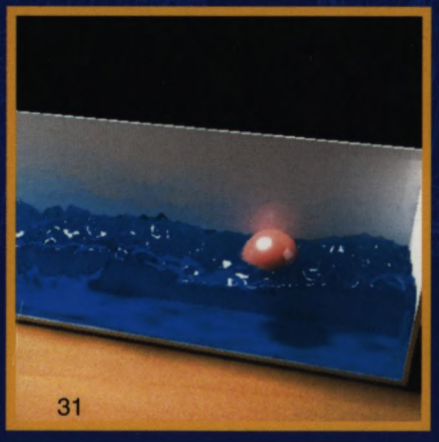

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