

# Graphics **Interface** 2007

Montréal, Canada

May 28 - 30, 2007

## Proceedings

Edited by

Christopher G. Healey

Edward Lank



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# President's Welcoming Letter



Canadian Human Computer Communications Society /  
Société Canadienne du Dialogue Humaine Machine

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Kellogg Booth  
Department of Computer Science  
University of British Columbia

The Canadian Human-Computer Communications Society (CHCCS) / Société Canadienne du Dialogue Humaine Machine (SCDHM) is a non-profit organization dedicated to advancing research and education in the fields of computer graphics, visualization and human-computer interaction. CHCCS/SCDHM is a Special Interest Group within the Canadian Information Processing Society (CIPS).

The primary activity of CHCCS/SCDHM is sponsoring the annual Graphics Interface conference that is often held as part of a larger suite of conferences. This year the AI/GI/CRV/IS 2007 conference, encompassing Artificial Intelligence, Computer & Robotic Vision, and Intelligent Systems in addition to Graphics Interface, is being held in Montreal, Quebec. The conference promises to be an exciting event, with a high quality selection of research papers covering many aspects of computer graphics, visualization, and human-computer interaction.

In addition to its annual conference, CHCCS/SCDHM sponsors four awards, the annual Michael A. J. Sweeney Award for the best student papers at the Graphics Interface conference, the annual Alain Fournier Ph.D. Thesis Award, the annual CHCCS/SCDHM Achievement Award presented to a Canadian researcher who has made substantial research contributions to the fields of computer graphics, visualization, or human-computer interaction, and the CHCCS/SCDHM Service Award presented to a Canadian who has made substantial service contributions to the society or the research community.

This year a number of awards are being made. In addition to the Michael A. J. Sweeney best student paper awards selected by the program committee, the second annual Alain Fournier Ph.D. Award, two Achievement Awards, one to Tom Calvert for 2006 and one to Saul Greenberg for 2007, and a Service Award to Gary Perlman are being presented at this year's conference. As well, the citation for the first Service Award that was presented to Fred Peet at the Graphics Interface 2005 appears in this year's proceedings.

The Awards Committee receives nominations each year and selects the annual Achievement Award winner and, from time to time, a Service Award winner. I would like to thank the following members of the CHCCS/SCDHM Awards Committee for serving on the committee this year.

Chair: Richard Bartels, University of Waterloo (emeritus)  
William Buxton, Microsoft  
Kori Inkpen, Dalhousie University

The executive committee for CHCCS/SCDHM is elected each year at the Annual General Meeting of the society during the Graphics Interface conference. Current members of the executive committee can provide further information on the society and on the Graphics Interface conference to those who are interested.

President: Kellogg Booth, University of British Columbia  
Vice president: Pierre Poulin, University of Montreal  
Treasurer: Stephen Mann, University of Waterloo  
Editor-in-chief: Ted Kirkpatrick, Simon Fraser University  
Webmaster: James Stewart, Queens University

On behalf of the society, and all of the volunteers who have helped to put on this year's conference, I extend a warm welcome to all of the attendees of AI/GI/CRV/IS 2007, and I offer our thanks to Christopher Healey and Edward Lank who served as program co-chairs for this year's Graphics Interface conference. The success of the conference ultimately rests on the quality of the technical program selected by the program committee and the many reviewers who provided the time to assist in the evaluation of the work that was submitted.

# Preface

## A Message from the Program Co-Chairs

---

Christopher G. Healey  
Department of Computer Science  
North Carolina State University

Edward Lank  
David R. Cheriton  
School of Computer Science  
University of Waterloo

Welcome to Graphics Interface 2007. This annual conference, now in its 33rd year, is devoted to computer graphics, interactive systems, and human-computer interaction. Beginning in 1969 as the “Canadian Man-Computer Communications Seminar” (CMCCS), it is the oldest regularly-scheduled computer graphics and human-computer interaction conference. This year, Graphics Interface was held May 27-29, 2007 in Montréal, Québec.

A total of 89 submissions were received, of which 43 papers were accepted. The final program is balanced between HCI and computer graphics, with both tracks seeing similar acceptance rates: 17/42 for the HCI track, and 26/47 for the graphics track.

The program committee consisted of 23 international experts. The program committee meeting was held in February at the University of Toronto. The great majority of papers received four reviews, two of which were from program committee members. We thank the program committee for their expertise and time in selecting a very high quality set of papers for this year’s conference. We also thank the many external reviewers for their help in this endeavor.

We would also like to extend our appreciation to this year’s invited speakers, who are both outstanding leaders in their respective fields: Julie Dorsey, Massachusetts Institute of Technology, and Scott Hudson, Carnegie Mellon University.

Lastly, we wish to thank several people whose efforts were indispensable in making Graphics Interface 2007 happen: Kellogg Booth, Pierre Poulin, James Stewart, Eugene Fiume, Torsten Möller, Arthur Kirkpatrick, and Meghan Haley.

For further information about the conference series we invite you to visit the web site, <http://www.graphicsinterface.org>.

# Organization

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Graphics Co-Chair  
North Carolina State University

**Edward Lank**  
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## Reviewers

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Bruce Gooch	Nigel Morris	Xiaoru Yuan
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# Michael A. J. Sweeney Award 2007



Canadian Human Computer Communications Society /  
Société Canadienne du Dialogue Humaine Machine

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The CHCCS/SCDHM honours the memory of Michael A. J. Sweeney through an annual award to the best student paper(s) presented at each year's Graphics Interface conference. The winning paper(s) selected by the program committee are chosen from among the papers accepted for the conference for which one or more student authors are presenting the paper.

## Best Student Paper 2007

In Memory

Michael A. J. Sweeney, 1951-1995

This year's winner of the Michael A. J. Sweeney Award goes to "A Digital Family Calendar in the Home: Lessons from Field Trials of LINC" by Carman Neustaedter (University of Calgary), A.J. Brush (Microsoft Research), and Saul Greenberg (University of Calgary).

The research reported in this paper is the culmination of Carman Neustaedter's just-completed PhD research on home calendaring systems, done in collaboration with A.J. Brush and Saul Greenberg. A.J. Brush worked with Carman in her role as supervisor during Carman's student internship at Microsoft Research, while Saul Greenberg guided Carman's PhD progress at the University of Calgary.

### ABSTRACT

Digital family calendars have the potential to help families coordinate, yet they must be designed to easily fit within existing routines or they will simply not be used. To understand the critical factors affecting digital family calendar design, we extended LINC, an inkable family calendar to include ubiquitous access, and then conducted a month-long field study with four families.

Adoption and use of LINC during the study demonstrated that LINC successfully supported the families' existing calendaring routines without disrupting existing successful social practices. Families also valued the additional features enabled by LINC. For example, several primary schedulers felt that ubiquitous access positively increased involvement by additional family members in the calendaring routine. The field trials also revealed some unexpected findings, including the importance of mobility—both within and outside the home—for the Tablet PC running LINC.

### BIO

Carman Neustaedter is currently a researcher at the University of Calgary, Canada, and a member of GroupLab and the Interactions Lab. He specializes in the area of Human-Computer Interaction, where he seeks to understand the socio-technical factors of ubiquitous technology design to support the everyday social practices of individu-

als and groups. His research spans the broad areas of computer science, cultural anthropology, sociology, and social psychology.

A.J. Brush's main research interest is human-computer interaction with a focus on computer supported cooperative work. She enjoys investigating how technology can help people and groups with everyday problems, such as too much email or family scheduling.

She received her Ph.D. in computer science from the University of Washington in Sept 2002. Her dissertation research looked at annotating digital documents for asynchronous collaboration, in particular using annotations for discussion in an educational setting, awareness of annotations, and anchoring of annotations. Brush's PhD research was primarily done while she was an intern in the Collaboration and Multimedia Systems group at Microsoft Research.

Saul Greenberg is a Full Professor in the Department of Computer Science at the University of Calgary. He specializes in Human Computer Interaction, Computer Supported Cooperative Work, and Ubiquitous Computing. He and his crew are well known for their development of: toolkits enabling rapid prototyping of groupware and ubiquitous appliances; innovative and seminal system designs based on observations of social phenomenon; articulation of design-oriented social science theories, and refinement of evaluation methods. Saul holds the iCORE/Smart Technologies Industrial Chair in Interactive Technologies, a distinguished University Professorship, and was recently elected to the ACM CHI Academy in for his overall contributions to the field of Human Computer Interaction.

# Alain Fournier Award 2007



Canadian Human Computer Communications Society /  
Société Canadienne du Dialogue Humaine Machine

On August 14th, 2000, Dr. Alain Fournier passed away. He was a leading international figure in computer graphics, and a strong and frequent contributor to the Graphics Interface conference. His insights, enthusiasm, wisdom, vast knowledge, humour, and genuine friendship touched everyone he met.

The “Alain Fournier Memorial Fund” was created to celebrate his life, to commemorate his accomplishments, and to honour his memory. It rewards an exceptional computer graphics Ph.D. thesis defended in a Canadian University over the past year. The winning thesis is selected through a juried process by a selection committee consisting of accomplished researchers in computer graphics.

For more information about the “Alain Fournier Memorial Fund”, and information about donation, please visit <http://www.cs.ubc.ca/~fournier>.

This year, Celine Latulipe is the recipient of the “Alain Fournier Ph.D. Thesis Award”. Her thesis, entitled “A Model for Symmetric Interaction”, demonstrates the benefits of a two-handed mouse-based symmetric user interface to increase expressiveness and productivity in practical settings. The successful pursuit of this thesis topic required her to develop a surprisingly wide range of skills, everything from the low-level programming of hardware devices to the careful design and execution of user studies.

Celine completed her university studies at the University of Waterloo, including her B.A. Honours in Economics and Applied Studies, her Master’s degree in computer science under the supervision of William Cowan, and her Ph.D. in computer science under the supervision of Craig Kaplan and Charles Clark. During her studies, she has also been very active in promoting computer science to young women, helping to organize a program to bring young women from Canadian high schools to the University of Waterloo. She also accomplished being a mother of two small children while pursuing her Ph.D studies. She is now a tenure-track Assistant Professor in the Department of Software and Information Systems at the University of North Carolina at Charlotte.



## Celine Latulipe

University of North Carolina  
at Charlotte

CHCCS/SCDHM Alain Fournier  
Award Recipient 2007

# Achievement Award 2006



Canadian Human Computer Communications Society /  
Société Canadienne du Dialogue Humaine Machine

The CHCCS/SCDHM Achievement Award is presented periodically to a Canadian researcher who has made a substantial contribution to the fields of computer graphics, visualization, or human-computer interaction. Awards are recommended by the CHCCS/SCDHM Awards Committee, based on nominations received from the research community. The 2007 members of the Awards Committee are Richard Bartels, William Buxton, and Kori Inkpen.



**Thomas W. Calvert**

Simon Fraser University

CHCCS/SCDHM Achievement  
Award Recipient 2006

Professor Tom Calvert of Simon Fraser University is one of the founding fathers of graphics and human-computer interaction research in Canada. He is a visionary researcher and educator. His work sits at the interfaces between engineering, computing science, and human performance. During his tenure at SFU he was the only professor to hold a full appointment in three schools: Kinesiology, Computing Science, and Engineering. In a long and distinguished career, he has inspired and guided work in animation, in user interfaces, in educational and learning technology, and in visualisation.

Dr. Calvert received a BSc(Eng) in Electrical Engineering from University College, London, in 1957, an MSEE from Wayne State University in 1964 and a PhD in Electrical Engineering from Carnegie-Mellon University in 1967.

Dr. Calvert is receiving the CHCCS/SCDHM Achievement Award for his long-term contributions to the development of computer graphics, visualisation, and human-computer interaction in Canada, most notably for his role in establishing and maintaining a “Western outpost” that was home to many students who gained their first experience in his laboratories and then joined companies in British Columbia that were the beginning of the strong graphics, animation, and multimedia industry that exists today. Tom’s accomplishments are particularly noteworthy for three characteristics.

First, he began and remains truly committed to multidisciplinary research and is an exemplar of “best practices” that has encouraged others to follow in his footsteps. A signature of Tom’s research is its scope: his collaborations span and enrich many disciplines, from art and performance to social science to computer science, engineering and kinesiology, to name only a few.

Second, his multi-decade leadership at SFU has been instrumental in consistently maintaining SFU as one of the leading Canadian institutions for computer graphics, visualisation, and HCI research. Since arriving at SFU in 1972, he has consistently pushed the boundaries of university teaching, organisation and research to recognise and

enrich the shifting landscape of digital technologies. He established the first graphics lab at SFU around 1984 that was a focal point for innovative ideas. In a long and distinguished career as a professor at Simon Fraser University he has spearheaded many initiatives including serving as Dean of Interdisciplinary Studies for eight years, Vice-president for Research and Information Systems for five years, and leader of the initiative to develop the new School of Engineering Science. In the early 1990s, he collaborated with SFU colleague Dr. Linda Harasim to develop tools to support online learning. Working with other researchers across Canada, Harasim and Calvert were leaders in establishing the TeleLearning Network of Centres of Excellence in 1995. He then moved to become a founding vice president at the new Technical University of BC, and then director of the School of Interactive Arts and Technology (SIAT) when SFU absorbed TechBC in 2002.

Third, he has consistently championed partnerships between art and technology in research. His well-known LifeForms work in human figure animation led to industry spin-offs Kinetic Effects and Credo Interactive. This is most recently evident in his pioneering contribution to the establishment of an educational institute devoted to combining art, science and technology (the Technical University of BC) and shepherding adoption of this vision by SFU as the School of Interactive Art and Technology. SIAT represents a bold step in education and research on human-centred technologies: a mix of art, design, psychology, new media and computer science. Tom’s guidance and vision have played key roles in the development of the new school and many other important ground-breaking projects in Western Canada that would not have succeeded without this help.

# Achievement Award 2007



Canadian Human Computer Communications Society /  
Société Canadienne du Dialogue Humaine Machine

The CHCCS/SCDHM Achievement Award is presented periodically to a Canadian researcher who has made a substantial contribution to the fields of computer graphics, visualization, or human-computer interaction. Awards are recommended by the CHCCS/SCDHM Awards Committee, based on nominations received from the research community. The 2007 members of the Awards Committee are Richard Bartels, William Buxton, and Kori Inkpen.



**Saul Greenberg**  
University of Calgary

CHCCS/SCDHM Achievement  
Award Recipient 2007

Dr. Saul Greenberg is a Professor in the Department of Computer Science at the University of Calgary. A computer scientist by training, the work that he and his students are engaged in typifies the cross-disciplinary aspects of human-computer interaction (HCI) and computer-supported collaborative work (CSCW). He is receiving the CHCCS/SCDHM Achievement Award for his long-term contributions to the field of HCI through the development of software toolkits for distributed systems, groupware and hardware-based physical user interfaces, and the use of social theories and observations in the design and evaluation of groupware. These contributions have made prototyping groupware and physical interfaces accessible to a wide community of practitioners and have laid a sound theoretical foundation for evaluating the effectiveness of those tools.

Dr. Greenberg received a BSc in microbiology and immunology in 1976 and a Diploma in Education in 1978, both from McGill University, and an MSc in computer science in 1984 and a PhD in 1989 from the University of Calgary. His dissertation was on Tool use, reuse and organization in command-driven interfaces. Saul has written over 100 journal articles, conference papers, book chapters, and invited publications, in addition to numerous short papers and posters at conferences, video publications, and other scholarly presentations. He has supervised over two dozen graduate students, many of whom have worked closely with researchers in industry during their degree programs. Before returning to university he worked as a high school teacher, which perhaps explains his reputation as an excellent instructor.

Toolkits developed by Dr. Greenberg and his colleagues include Groupkit, Collabrary, SDGToolkit, and Phidgets. Major systems based on social theories and observations include GroupSketch, GroupDraw, TeamRooms, Notification Collage and Community Bar, as well as numerous other experimental prototypes. These have built upon his empirical investigations of awareness, casual interaction and privacy, and the heuristic evaluation of groupware.

Saul has a strong commitment to making his tools, systems, and educational material readily available to other HCI researchers and educators. His HCI lecture notes were one of the first to be available on-line, and are heavily downloaded and used. The collection of papers he edited on computer supported cooperative work and groupware (1993) and the collection he co-edited on human-computer interaction (1995) helped to establish both of these areas as distinct fields within computer science by providing overviews of seminal papers and commentaries that placed those papers into a theoretical framework. He regularly participates on program committees for major international conferences and has served on the ACM SIGCHI Publications Board. He is currently a member of the editorial boards for the International Journal of Human Computer Studies and the Journal of Computer Supported Cooperative Work.

Dr. Greenberg holds the iCORE/Smart Technologies Industrial Chair in Interactive Technologies and he was awarded a University Professorship at the University of Calgary in recognition of his research excellence. He is a theme leader and a founding member of the executive committee for the Network for Effective Collaboration Technology through Advanced Research (NECTAR), a research network funded by the Natural Sciences and Engineering Research Council of Canada. His achievements as both an HCI researcher and as an educator have been truly outstanding. He was inducted into the ACM CHI Academy in 2005.

An avid back-country skier and mountain climber, he lives in Canmore, Alberta, with his wife and children.

# Service Award 2005



Canadian Human Computer Communications Society /  
Société Canadienne du Dialogue Humaine Machine

The CHCCS/SCDHM Service Award is presented from time to time to a Canadian who has made a substantial service contribution to the organization.

Fred Peet has been a mainstay in the Canadian Human-Computer Communications Society / Société Canadienne du Dialogue Humaine Machine (formerly the Canadian Man-Computer Communications Society). He has served as Treasurer of the Society since 1980 after the National Research Council gave up running its pioneering conferences on computer graphics and interaction in 1979. The Society was formed to continue the conferences and has done so every since, with Fred overseeing the finances.

Fred received his PhD in Physics from the University of British Columbia in Vancouver. He went to work for the Canada Centre for Remote Sensing in Ottawa and then moved to what is now the Pacific Forestry Centre in Victoria. In 1984 he was transferred into a program to devote all his time to studying problems in forest entomology and pathology. Subsequently he started his own company (Eidetic) developing remote sensing software for microcomputers and has sold his products into more than 40 countries. In addition to Graphics Interface, he has published in a number of journals including Remote Sensing of Environment, IEEE-PAMI, Analytical and Quantitative Cytology, and Phytopathology.

The Canadian Man-Machine Communications Conference was started by the Radio and Electrical Engineering Division of the National Research Council in 1969. Its purpose was not only to showcase the work of Canadian researchers in man-machine interaction but also to present the results of work being achieved in the Radio & EE Division itself, and to provide a venue where researchers could exchange ideas and network.

Initially this was a biennial conference. After four successful ventures held in Ottawa, the 1977 conference was held in Calgary under separate sponsorship, but the conference returned to Ottawa in 1979, once more sponsored by the Division. By that time it was felt that the conference was substantial enough to stand on its own. Herb Bown from the Department of Communications had been campaigning since 1975 for an organization to be formed which would assume the direction of the conference.



**Fred Peet**

Pacific Forestry Centre  
Natural Resources Canada/  
Centre foresterie du Pacifique  
Ressources naturelles Canada

CHCCS/SCDHM Service Award  
Recipient 2005

An ad hoc committee was established and brought the Canadian Man-Computer Communications Society into existence as a special interest group of the Canadian Information Processing Society. Fred's involvement began in 1978 with writing a Society Newsletter and in 1980 he became Treasurer. The 1981 conference held at the University of Waterloo was the first conference sponsored by the new Society. In 1982 the name of the conference was changed to Graphics Interface and it became an annual conference.

In the early days of CHCCS/SCDHM finances were a problem, but Fred stepped into the breach. He ensured that the society was able to function so that successive conference chairs did not have to scramble for funding. This meant that notable speakers could be invited and some of their expenses covered, allowing conference chairs to increase the visibility and the reputation of the international conference. Fred almost single-handedly provided the year-to-year continuity in managing the finances of the organization and the conference. It is due to his efforts that the conference has been able to survive the ups and downs that have affected other conferences in the field.

We gratefully acknowledge Fred for the twenty-five years of service he has given to the organization through his wisdom, his guidance, and his time. The conference would not exist today if it were not for his nurturing.

# Service Award 2007



Canadian Human Computer Communications Society /  
Société Canadienne du Dialogue Humaine Machine

The CHCCS/SCDHM Service Award is presented from time to time to a Canadian who has made a substantial service contribution to the organization.



**Gary Perlman**

Online Computer Library Center

CHCCS/SCDHM Service Award  
Recipient 2007

Dr. Gary Perlman has made a substantial contribution to the international research community in the field of human-computer interaction (HCI) for his work as the founding director of the HCI Bibliography ([hcibib.org](http://hcibib.org)), a free-access online resource of over 36,000 records that provide access to the HCI literature and related subjects. The “H-C-I-BIB” as it is called by bibliographers, grew out of his efforts in 1988-89 at the Software Engineering Institute to develop a curriculum module on user interface development. It has since grown to be a major source for information on research in the field.

A native of Canada, Gary Perlman was born and raised in Montréal, during which time he attended two Stanley Cup final games. He left Québec after high school, to avoid CEGEP, and attended the University of Rochester where he earned a BA in 1977 in psychology with extensive coursework in mathematics and computer science. Dr. Perlman earned an MA in 1978 and a PhD in 1982, both in experimental (cognitive) psychology from the University of California, San Diego, where he was supported by an NSERC postgraduate fellowship.

In addition to over 20 years of consulting in information technology, he has held research and academic positions at Bell Labs at Murray Hill NJ, Wang Institute of Graduate Studies, Massachusetts Institute of Technology, Carnegie-Mellon University in the Software Engineering Institute, the Ohio State University, and the Online Computer Library Center (OCLC) where he is a consulting research scientist and holds primary responsibility for user interfaces in library information systems, particularly multilingual and accessible systems. After 30 years in the United States, he moved back to Montréal in 2003, when his wife accepted a Canada Research Chair at McGill University. He currently conducts his R&D job at OCLC from Québec, as a telecommuter.

His research interests are in making information technology more useful and usable for people. He is the author of over 75 journal and conference articles, including one reprinted in *The Best of the Journal of Irreproducible Results*.

The HCI Bibliography is a significant achievement, emerging after a decade of work. As part of the process, Gary directed work-study students who entered abstracted bibliographic records, which he found useful to have online. Naïvely thinking that if a few students could add hundreds of records, the HCI community as a whole could add thousands, he led to a proposal to the ACM SIGCHI to create an online bibliography; this was met with uniform skepticism. Undaunted, Gary continued with the work-study program at Ohio State University providing the labour needed to add an initial few thousand records to the HCIBIB. Over a hundred volunteer validators then made thousands of corrections, producing a high quality bibliography.

There were a number of organizational issues to be overcome. Publishers were willing to give permissions to have their abstracts online, although sometimes this required urging from their editorial boards. In 1991, the first article on the HCIBIB appeared in the SIGCHI Bulletin, boasting over 1000 entries. Support from SIGCHI and Apple Computer followed, which helped to add structure and boost productivity. After a variety of awkward access schemes, the HCIBIB moved to its own domain ([hcibib.org](http://hcibib.org)) in 1997, and started offering its search service in 1998 hosted by SIGCHI ([sigchi.org](http://sigchi.org)). Around the same time, the HCI Webliography started cataloguing websites.

Adding one to two thousand bibliographic records a year, the HCIBIB has grown to over 36,000 records, including links to over 1800 websites. An improved search engine was added at the end of 2006, offering new capabilities to thousands of people interested in HCI. For his many years of contribution, Dr. Gary Perlman has been selected to receive the 2007 CHCCS/SCDHM Service Award.

# Keynote Address

## Digital Materials and Virtual Weathering: Modeling the Appearance of the Everyday World

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### Julie Dorsey

Department of Computer Science  
Yale University



### BIO

Julie Dorsey is a Professor of Computer Science at Yale University, where she teaches computer graphics. She came to Yale in 2002 from MIT, where she held tenured appointments in both the Department of Electrical Engineering and Computer Science (EECS) and the School of Architecture. She received undergraduate degrees in architecture and graduate degrees in computer science from Cornell University.

With architecture as a driving application, she has studied a wide range of problems in computer graphics, including sketch-based interfaces for early conceptual design, acceleration methods for real-time rendering, and the creation of detailed photorealistic renderings. Her contributions also include algorithms for lighting and acoustical design and visualization. She is particularly well known for her research in modeling the appearance of materials - for example, she pioneered techniques to model the visual richness of irregular metal patinas and eroded stone. Her current research interests include photorealistic image synthesis, material and texture models, illustration techniques, and interactive visualization of complex scenes, with an application to urban environments.

In addition to serving on numerous conference program committees, she is an associate editor for IEEE Transactions on Visualization and Computer Graphics; The Visual Computer; and Foundations and Trends in Computer Graphics and Vision; and was Papers Chair for ACM SIGGRAPH 2006. She has received several professional awards, including MIT's Edgerton Faculty Achievement Award, a National Science Foundation Career Award, and an Alfred P. Sloan Foundation Research Fellowship.

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For more information, please visit: <http://graphics.cs.yale.edu/julie/index.html>.



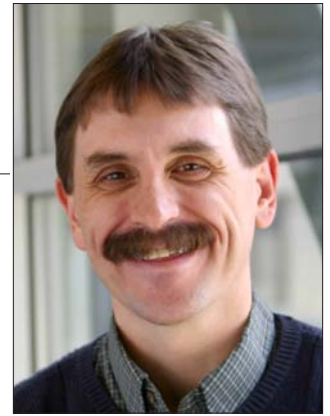
# Keynote Address

## Paying Attention to Attention: an Organizing Principle for Research in Ubiquitous Computing

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### Scott Hudson

Human-Computer Interaction Institute  
School of Computer Science  
Carnegie Mellon University



### ABSTRACT

In 1969 Herbert Simon put forward the idea that: “in an information rich world, the scarce resource is [human] attention.” Today this would seem to be increasingly true. This talk will suggest that a number of the important challenges for modern interactive computing - goals we describe as “invisible”, “ambient”, “pervasive”, “ubiquitous” or even “calm” – are fruitfully considered in these terms. I will suggest that traction can be gained by focusing on optimization of human attention as a principle. Illustrations of the value of using this perspective to view the research will be drawn from our ongoing “Managing Human Attention” project.

### BIO

Scott Hudson is a Professor in the Human-Computer Interaction Institute within the School of Computer Science at Carnegie Mellon University where he directs the HCII PhD program. He was previously an Associate Professor in the College of Computing at Georgia Tech and prior to that an Assistant Professor of Computer Science at the University of Arizona. He earned his Ph.D. in computer science at the University of Colorado in 1986. He has regularly served on program committees for the SIGCHI and UIST conferences, and served as Program Chair for UIST '90 and UIST '00, as well as Symposium Chair for UIST '93. He also served as a founding Associate Editor for ACM Transactions on Computer Human Interaction. His recent research funding has been from the National Science Foundation, and DARPA.

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For more information, please visit: <http://www.cs.cmu.edu/~hudson/>.