Graphics **Interface** 2017

Edmonton, Alberta
16–19 May 2017

Proceedings

Edited by

Elmar Eisemann
Scott Bateman

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**Canadian Human-Computer Communications Society /
Société canadienne du dialogue humain-machine**

Paul G. Kry
School of Computer Science
McGill University, Canada

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 computer graphics, visualization, and human-computer interaction. The primary activity of CHCCS/SCDHM is sponsoring the annual Graphics Interface conference, the longest-running regularly scheduled conference on interactive computer graphics. In most years, Graphics Interface is held as part of a larger suite of conferences. This year the AI/GI/CRV 2017 conference, encompassing Artificial Intelligence and Computer and Robotic Vision along with Graphics Interface, is located in Edmonton, Alberta. The conference promises to be an excellent event, with a selection of high quality papers in computer graphics, visualization, and human-computer interaction, accompanied by a lively posters and demo session featuring new and late breaking ideas as well as work in progress.

In addition to its annual conference, CHCCS/SCDHM sponsors several awards. The annual Michael A.J. Sweeney Award recognizes best student papers presented at the conference. The annual Alain Fournier Dissertation Award and the Bill Buxton Dissertation Award recognize the best Ph.D. dissertations awarded in Canada during the previous year for computer graphics and human-computer interaction, respectively. The annual CHCCS/SCDHM Achievement Award is presented to a Canadian who has made substantial research contributions to computer graphics, visualization, or human-computer interaction. The CHCCS/SCDHM Service Award is presented to a Canadian who has rendered substantial service contributions to the society or to the research community. Each year the Awards Committee receives nominations and selects a winner of the Achievement Award and, from time to time, a winner of the Service Award. The current committee is chaired by Marilyn Tremaine, Rutgers University, and has as members Kellogg Booth, University of British Columbia, Brian Wyvill, University of Victoria, and Michiel van de Panne, University of British Columbia. I thank the Awards committee for their efforts in finding a very well-deserving recipient. Winners of the Alain Fournier Award and Bill Buxton Award are selected by independent committees coordinated by Pierre Poulin. I am very grateful to Pierre and the members of the respective committees for their work in identifying the top dissertations of 2015. The Michael A.J. Sweeney Award winners are selected by the program co-chairs in consultation with the program committee. Finally, the CHCCS/SCDHM continues to host he Canadian Digital Media Pioneer awards which were first initiated by the GRAND NCE in 2011, with Eugene Fiume serving to coordinate the selection committee.

The Annual General Meeting of CHCCS/SCDHM is held every year during the Graphics Interface conference, to review the previous year's activities and elect the executive committee. Current members of the executive committee are

- Paul Kry, *McGill University, president*
- Pierre Poulin, *Université de Montréal, vice president*
- Michael McGuffin, *École de Technologie Supérieure, treasurer*
- William Cowan, *University of Waterloo, past president*
- Derek Reilly, *Dalhousie University, editor-in-chief*
- James Stewart, *Queen's University, web master*

All Graphics Interface attendees are invited to attend the General Meeting. I encourage everyone interested in the future of Graphics Interface to attend and get involved. News and topics of discussion at this year's meeting will include DOIs for all articles in the digital library dating back to 1971, open access for papers combined with improved indexing in the ACM digital library, a new electronic cover design, and new sponsorship from GRAND NCE legacy funds that CHCCS/SCDHM will use to support Canadian student involvement in digital media research.

On behalf of the society, and of all those who have worked to put on this year's conference, I extend a warm welcome to all the attendees of AI/CRV/GI 2017. I wish to thank this year's co-chairs, Elmar Eisemann and Scott Bateman, along with the committee members and referees for all their hard work in creating the conference program. And most important, I wish to thank all the authors who submitted their research. Without their commitment there would be no conference.

Preface

A Message from the Program Co-chairs

GRAPHICS CO-CHAIR
Elmar Eisemann
Delft University of Technology,
Netherlands

HCI CO-CHAIR
Scott Bateman
University of New Brunswick,
Canada

Graphics Interface is the oldest continuously-scheduled conference in computer graphics and human-computer interaction. The conference dates back to 1969, when it was the "Canadian Man-Computer Communications Seminar", changing its name in 1982 to Graphics Interface. This year is Graphics Interface's 43rd year, and it takes place in Edmonton, Alberta from May 16th to 19th.

The program for Graphics Interface 2017 features 26 papers. We received 28 (HCI) + 24 (Graphics) submissions. Among these high-quality submissions, we were able to accept 14 papers from the HCI track (50%), and 12 papers from the Graphics track (50%).

The program committee comprised 29 experts from Graphics and HCI. Each paper was formally reviewed by two committee members, at least two external reviewers, and often received informal reviews from more. A fully double-blind reviewing process was used: the identity of the paper authors was known only to the program committee and to the primary committee member assigned to the submission. We thank the program committee and the external reviewers for ensuring rigor and integrity in the reviewing process.

The Michael A. J. Sweeney Award will be awarded at the conference to the best student papers in graphics and HCI. This year, Microsoft and NVIDIA have kindly sponsored Graphics Interface with prizes for best papers.

Since 2012, authors of selected top papers in graphics have be invited to submit extended and revised manuscripts to be considered, with partial reviewer continuity, for journal publication in a special section of *IEEE Transactions on Visualization and Computer Graphics* (*TVCG*) and *Computers & Graphics*. We look forward to seeing the final extended versions of these selected papers later this year in the special section on graphics interaction.

We are proud to include keynote talks from three invited speakers, one Achievement Award winner, one Canadian Digital Media Pioneer Award and two dissertation award winners. The three invited keynote speakers, Andy Wilson (Microsoft Research), Sylvain Paris (Adobe Systems) and Karol Myszkowski (Max-Planck-Institut fuer Informatik) are all well known for their exemplary contributions to their disciplines. Our congratulations to Kori Inkpen (Microsoft Research), this year's recipient of the recipient of the CHCCS/SCDHM Achievement Award. Further congratulations to Tom Calvert (Simon Fraser University) the recipient of the Canadian Digital Media Pioneer (CDMP) Award. We also congratulate the two dissertation award winners, Jagoda Walny (University of Calgary)—2016 Bill Buxton Dissertation Award, and Felix Heide (University of British Columbia)—2016 Alain Fournier Dissertation Award.

We are excited this year to continue the very well received Graphics Interface Speaker Series, sponsored in part by Microsoft. We have seven speakers this year, each with an exemplary track record, and a leader in his or her respective fields: Anthony Tang (University of Calgary), Nils Thuerey (Technische Universitaet Muenchen), Lyn Bartram (Simon Fraser University), Ed Lank (University of Waterloo), Alec Jacobson (University of Toronto), and Derek Nowrouzezahrai (McGill University).

We would like to thank various people who contributed to the behind-the-scenes conference organization, especially Paul Kry, Pierre Poulin, Kelly Booth, Marilyn Tremaine, and Meghan Haley. Thanks also go out to Spencer Rose for the conference web design and maintenance, James Stewart and Precision Conference Solutions for handling the electronic submission and review system, Alix Goguey—the Poster Chair, Pierre Poulin and Nilanjan Ray—the AI/GI/ CRV General Co-Chairs, and Barb Robinson for help with the local arrangements and AI/GI/CRV website. For further information about the conference series, you can visit the official web site, http://www.graphicsinterface.org

Organization

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Service Award 2016

Canadian Human-Computer Communications Society /
Société canadienne du dialogue humain-machine

Adrian Sheppard
GRAND
CHCCS/SCDHM Service Award
Recipient 2016

The 2017 CHCCS/SCDHM Service Award of the Canadian Human-Computer Communications Society is presented to Adrian Sheppard for his many contributions to the Canadian digital media community in his role as the Network Manager for the Graphics, Animation and New Media Network of Centres of Excellence (GRAND).

From the outset, Adrian Sheppard was a key member of the network's management team. He initially held the position of Director of Operations, but was quickly promoted to Network Manager during his first year, a position he held for the remainder of GRAND's tenure as a Network of Centres of Excellence and during the post-network wind-down period. As network manager, Adrian was responsible for all aspects of the operational management of the network and he was GRAND's primary liaison with the NCE Secretariat. He put in place policies and procedures for managing the network and was instrumental in setting up the financial structures necessary for the multi-university partnership. He worked closely with GRAND's Board of Directors and Research Management Committee, as well as with many of the faculty, postdoc, and student network researchers and their corporate and public partners.

Adrian's tireless efforts to ensure that GRAND met the financial and reporting requirements of the NCE program no doubt gave the impression to many that running an NCE was easy. It was not. Adrian was never hesitant to step in when something – or someone – drifted off course, but he always did so in good spirit, with a sense of humor and with consideration for the complex inter-relationships within the broad set of stakeholders that made the GRAND network such a unique organization within the digital media research community in Canada.

Adrian brought a wealth of experience to the role of network manager. Prior to joining GRAND, Mr. Sheppard worked for the Office of Research Services at Simon Fraser University where he negotiated and managed research contracts and worked closely with the University Industry Liaison Office (UILO) on agreements related to the protection and commercialization of intellectual property arising from university research. He had also worked for the Ministry of Finance and Corporate Relations of the BC Provincial Government on its Intangible Property Program, which is responsible for the commercialization of government-owned intellectual property.

As the network manager of GRAND, Adrian Sheppard was the driving force in the development of the Forum, the software system GRAND developed to collect data for the network's reports to the NCE Secretariat. Adrian's ability to interpret policies and procedures into realistic software requirements while balancing the network's reporting needs and researchers' sensitivities to administrative overhead showed his understanding of the perfect-functionality vs. usefulness-at-a-deadline trade-off. In this and in all other tasks that he undertook, his wry sense of humour and calm balanced approach to managing competing interests proved invaluable to the success of the network. The Forum software was subsequently adopted by other NCEs as their reporting platform, a testament to its comprehensive and flexible design.

A native of Calgary, Alberta, Mr. Sheppard holds a law degree (1996) and a bachelor of mathematics (1994) from the University of Victoria and bachelor's degrees in philosophy (1985, with distinction) and English (1983) from the University of Calgary. As a law student, he received the David Roberts Prize in Legal Writing, the

J.C. Scott-Harston Prize in Wills Drafting, and the Royal Trust Prize in Trusts. He received a Public Service Awards – Partnership Gold Award from the Province of British Columbia in 2001. He was probably the only network manager of an NCE able to knowledgeably discuss the Axiom of Choice.

GRAND NCE was created in 2009 through the Networks of Centres of Excellence program to employ an interdisciplinary and interconnected approach to address Canada's technological, creative, socio-economic, legal and cultural challenges in digital media. Over the course of its five-year life, the network made significant progress in realizing this vision. Through its innovation and creative achievements, GRAND research developed lasting social, health, and economic benefits that will improve the quality of life of all Canadians and enhance Canada's global competitiveness. GRAND linked 250+ researchers at 33 Canadian universities in nine provinces, as well as 184 industry partners and other receptors, who were the stakeholders and receptors of the research outcomes. The sense of community that GRAND fostered in Canadian digital media is, in large part, due to Adrian Sheppard's steadfast leadership as Network Manager.

Michael A. J. Sweeney Award 2017

**Canadian Human-Computer Communications Society /
Société canadienne du dialogue humain-machine**

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

Best Student Papers 2017

In Memory
Michael A. J. Sweeney, 1951-1995

Graphics 2017 Award Winner

"FLOWPAK: Flow-based Ornamental Element Packing", by Reza Adhitya Saputra (University of Waterloo), Craig S. Kaplan (University of Waterloo), Paul Asente (Adobe Research), and Radomír Měch (Adobe Research).

Biographies

Reza Adhitya Saputra is a PhD student at the University of Waterloo, Canada under supervision of Craig S. Kaplan. Since his childhood in Indonesia, he has been fascinated by comics, 2D animations, and movies. Those interests influence his current research that includes non-photorealistic rendering, vector graphics, and element packings.

Craig S. Kaplan is an Associate Professor of Computer Science at the University of Waterloo. He has a PhD in Computer Science from the University of Washington. Craig studies the application of computer graphics and mathematics to problems in art, architecture and design, and experiments with computer-aided art and design using modern technology like 3D printing. He helps organize the annual Bridges Conference on art and mathematics.

Paul Asente is a Senior Principal Scientist with Adobe Research. He received his Ph.D. from Stanford University in 1987 and has been with Adobe since 1990. His research focus areas include stylization, 2D and 3D design, animation, and documents. Paul is especially proud of the outstanding graduate students from all over the world that he collaborates with.

Radomír Měch received his Ph.D. from University of Calgary in Canada, working on procedural modeling of plants and trees. Radomír now heads the Procedural Imaging Group at Adobe Research. The group's research covers areas of 2D and 3D design, image processing, modeling, natural media simulation, and HCI. His areas of research are modeling and imaging algorithms, with a particular focus on interaction with procedural models, casual modeling, rendering, and 3D printing.

HCI 2017 Award Winner

"Tell Me More! Soliciting Reader Contributions to Software Tutorials", by Patrick Dubois (University of Manitoba), Volodymyr Dziubak (University of Manitoba), and Andrea Bunt (University of Manitoba).

Biographies

Patrick Dubois is a Ph.D. student in Computer Science at the University of Manitoba. He completed his M.Sc. (2017), focusing on enhancing collaboration between online software tutorial followers, and his B.C.S. (2015), both at the University of Manitoba. His research interests are in human-computer interaction, and include software learnability, differences in software usage between urban and rural communities, and adapting software for use by elementary schools. Patrick has received the NSERC Canada Graduate Scholarship - Master's (2015) and Doctoral (2017).

Volodymyr Dziubak is a Ph.D. student in the Computer Science Department at the University of Manitoba. Volodymyr's research involves studying and supporting work practices of professional digital designers and artists, such as curiosity-driven software learning and inspiration seeking. Volodymyr completed his B.Sc. (2011) and M.Sc. (2013) degrees in Computer Science in Ukraine (his home country). Before starting his Ph.D., he worked as an interaction designer in an online learning company in the Netherlands.

Andrea Bunt is an Associate Professor of Computer Science at the University of Manitoba where she co-directs the Human-Computer Interaction (HCI) Lab. Andrea completed her Ph.D. (2007) and M.Sc. (2001) at the University of British Columbia, and her B.Sc. (1999) at Queen's University. Prior to joining the University of Manitoba, Andrea worked as a Postdoctoral Fellow at the University of Waterloo. Andrea's research falls into the areas of human-computer interaction and intelligent interactive systems, with an emphasis on issues surrounding feature-rich software, community-authored help resources, and computing experiences in rural and remote communities.

Canadian Digital Media Pioneer Awards 2017

Canadian Human-Computer Communications Society / Société canadienne du dialogue humain-machine

Tom Calvert is a visionary scientist, educator, administrator, and a Canadian Digital Media Pioneer. Throughout a long and distinguished career, Professor Tom Calvert has exemplified the spirit of a true digital pioneer. As one of the founding fathers of computer graphics and human-computer interaction research in Canada, his work sits at the interfaces between engineering, computing science, human performance, art, and social science. From academia to industry, he has been exceptional in his ability to connect people and ideas, and his devotion to exploring how technology might improve human activities across a variety of educational, artistic, and health-related fields.

Tom Calvert
Simon Fraser University
Canadian Digital Media
Pioneer Award Recipient 2017

Tom is a true "Renaissance man." In 45 years at Simon Fraser University, he was – and remains – the only professor to hold a full appointment in three schools: Computing Science, Kinesiology, and Engineering Science, an academic program for which he was one of two co-founders. He was instrumental in the development of science and technology organizations in British Columbia: he served as President of the Science Council of British Columbia; he oversaw the creation of organizations such as the B.C. Software Productivity Centre and he served on many external boards and committees, including Science World, TRIUMF, Discovery Foundation, IBM Centre for Advanced Studies, B.C. Advanced Systems Institute, National Wireless Communication Research Foundation and the Manning Foundation. He was a co-founder of the TeleLearning NCE, SFU's first hosted Network of Centres of Excellence, and one of the first NCEs to successfully bring together researchers from science and engineering with researchers from the social sciences and humanities to address issues important for Canada through the deployment of digital media technology.

As a researcher, Tom has inspired and guided foundational work in animation, user interfaces, educational and learning technologies, visualization, and tools for performance, composition, and artistic creation. A strong entrepreneurial spirit led to academic-industrial projects and spin-offs founded by students and collaborators in character animation and VR, movement choreography and notation, and educational technology. His impact extends well beyond his personal body of work: he is a motivator and a champion of people who seek to push the envelope of digital media. He has been a strong mentor and a true statesman in creating opportunities for people to pursue their vision: working to ensure that funding, collaborators and structures existed to support others exploring those opportunities.

Distinguishing his career from other notable Canadian academics is Tom's ongoing commitment to interdisciplinary work. Throughout his career, he has consistently pushed the boundaries of university teaching, administration, and research to recognize and enrich the evolving landscape of digital technologies. For many years, he has been a true champion of art-technology partnerships in research and in practice. His directorship of the graphics and multimedia lab at SFU fostered open dialogue and novel research collaborations among dancers, computer scientists, and kinesiologists that culminated in a digital media start up, Credo Interactive, and a revolutionary choreography tool called Life Forms™ | Dance Forms™ that was used by Merce Cunningham, one of the fathers of American modern dance.

Tom's vision for art and technology partnerships motivated perhaps his most enduring legacy. Before retiring from SFU in 2000, he co-founded and nurtured an ambitious interdisciplinary educational institution dedicated to integrating art, media, science and technology that eventually became SFU's School of Interactive Arts + Technology (SIAT) in 2002. SIAT was a bold step in education and research on human-centred technologies. Its novel curriculum is a mix of art, design, psychology, digital media and computer science. Tom had a leadership role in the creation of the professional Masters of Digital Media Program at the cross-institutional Centre for Digital media (SFU, UBC, ECUA+D and BCIT). The programs at SIAT and CDM have enlarged and enriched the landscape of digital media in Canada. Tom's leadership and vision helped craft and transform the landscape of art and technology partnerships in his 45 years of service to Canadian education, research, and innovation.

Biography

Born and raised in the U.K., Thomas W. G. Calvert earned a bachelor's degree in electrical engineering from University College, London, in 1957. He then worked as an instrumentation engineer at the Metals Division of ICI Ltd. in the U.K. and Canadair Ltd. in Montreal from 1957-1961, after which he was a Lecturer at the Western Ontario Institute of Technology from 1961 to 1964. He earned a high school teaching certificate from the Ontario College of Education (now OISE, part of the University of

Toronto) in 1963. He earned a master's degree in electrical engineering at Wayne State University in 1964 and then worked in the department as an Instructor for one year. He earned a doctorate in electrical engineering from Carnegie-Mellon University in 1967, and was an Assistant and then an Associate Professor of Electrical Engineering at CMU for five years before becoming a faculty member at Simon Fraser University in 1972, with appointments in the School of Computing Science, the School of Engineering Science, and the Department of Kinesiology.

Tom served in many leadership positions during his time at Simon Fraser. He was chair of the Department of Kinesiology for two years starting in 1975 and then was Dean of the Faculty of Interdisciplinary Studies from 1977 to 1985, after which he took on the role of Vice President for Research and Information Systems until 1990, when he was granted a leave of absence to become the President of the Science Council of British Columbia. In 1993, he took on the role of Director of the Centre for Systems Science at SFU until he became the Co-leader of the TeleLearning Network of Centres of Excellence from 1996 and Director of Technology in 1999, a position he held until 2002. Before retiring in 2000 from SFU Burnaby as Professor Emeritus, Tom served as VP Research and External Affairs for the newly formed Technical University of British Columbia from 1997 to 2002 and from 1999 to 2002 he also served as President and CEO of TechBC Corporation. When TechBC became the School of Interactive Arts + Technology at SFU Surrey in 2002, Tom served as Acting Director until 2004, after which he continued his research and teaching there as Professor Emeritus.

In addition to his many academic roles, Tom was Founder and Director of Credo Interactive Inc., a successor to Kinetic Effects Research Inc., an SFU spin-off company formed to commercialize his research on dance and choreography. He was VP Software from 2004 to 2006, after which he has continued to serve as President and CEO. He was a member of the Natural Sciences and Engineering Research Council from 2000 to 2006 and was a member of the Manning Innovation Awards Selection Committee from 1995 to 2009. He is a member of the Board of Examiners of the Association of Professional Engineers and Geoscientists of British Columbia (APEGBC), IEEE, ACM, and Sigma Xi. He received a Meritorious Achievement Award from APEGBC in 1993, a Xerox Canada Forum Award for furthering corporate-university cooperation in 1995, the Science Council of BC Chairman's Award for Career Achievement in 1997, and the CHCCS Achievement Award in 2006. He was elected a Fellow of the Canadian Academy of Engineering in 1998.

Alain Fournier Award 2016

**Canadian Human-Computer Communications Society /
Société canadienne du dialogue humain-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. dissertation defended in a Canadian University over the past year. The winning dissertation 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://graphicsinterface.org/awards/alain-fournier/.

Felix Heide
University of British Columbia
CHCCS/SCDHM Alain Fournier
Award Recipient 2016

Felix Heide is the recipient of the 2016 Alain Fournier Ph.D. Dissertation Award. His dissertation, entitled "Structure-aware Computational Imaging", makes exceptional research contributions to computational imaging and displays, with several major impacts in computer graphics, image processing, computer vision, optics, and photography.

The central theme tackles the use of computations to enable more robust, less expensive, and more portable optical devices. It opens opportunities to new imaging modalities, a temporal dimension of light as it propagates and a per-pixel radial velocity dimension, by resolving inverse problems with approaches from sparse coding and convex optimization. One such theme replaces the trend of more complex lenses by simplifying instead the optical design and correcting computationally the ensuing aberrations with complementary information from multiple color channels. A second theme addresses "light-in-flight" imaging with inexpensive depth cameras, with applications in 3D reconstructions without direct line of sight, imaging in scattering media, and many others. These projects open promising new avenues to approach old and new problems with exciting possibilities.

Felix completed his B.Sc. and M.Sc. in Computer Science at the University of Siegen in 2009 and 2011, respectively. From 2012 to 2016, he completed his Ph.D. program in Computer Science at the University of British Columbia, under the supervision of Dr. Wolfgang Heidrich. He has been an extremely prolific researcher with seven ACM Trans. on Graphics papers, two "oral" papers at CVPR, two in Optics Express, and one in Nature Scientific Reports, all as first author. He has also co-authored almost as many other papers in the same and other related conferences and journals. He participated to five patents, co-founded the company Algolux, and served on program committees of SIGGRAPH Asia, Eurographics, and two CCD workshops of CVPR, as well as chaired the poster program of ICCP.

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

For more information, please visit: http://stanford.edu/~fheide/

Bill Buxton Dissertation Award 2016

**Canadian Human-Computer Communications Society /
Société canadienne du dialogue humain-machine**

The award is named in honour of Bill Buxton, a Canadian pioneer who has done much to promote excellence, both within Canada and internationally, in the field of Human-Computer Interaction. Bill truly advocates HCI. He challenges how academics and practitioners think, and inspires them to do things differently. This is why we are proud to name this award after him.

The award is determined through a juried process by a selection committee consisting of accomplished researchers in Human-Computer Interaction. This year, the jury was Dr. Derek Reilly (Dalhousie University) and Dr. Michael McGuffin (École de Technologie Supérieure). Dr. Edward Lank (University of Waterloo) facilitated the process.

The recipient of the 2016 award for the best doctoral dissertation completed at a Canadian university in the field of Human-Computer Interaction is Dr. Jagoda Walny.

Jagoda Walny

University of Calgary
CHCCS/SCDHM Bill Buxton
Award Recipient 2016

In her dissertation, Thinking with Sketches: Leveraging Everyday Use of Visuals for Information Visualization, Jagoda explores how the ways that people think and create visually in their day-to-day and work lives can inform visualization design and tools. This is a broad and difficult topic, but nonetheless one that is critically important to Information Visualization, particularly as interactive visualizations become commonplace. The dissertation opens up this new topic by first examining sketching as a fundamental technique for thinking, communication, and creation, then reviewing how sketching has inspired computer interfaces, and ultimately identifying how sketching is relevant to visualization. Jagoda takes risks to break new ground, taking a largely qualitative approach to understand actual sketching practice, and to explore how the flexibility and nuance of sketching translates to computer tools for visualization. Through that work, Jagoda generates key insights, including that transitions – passages of a sketch from one state to another – should be an area of focus for tool designers. Jagoda's insights are generative: she then explores how active reading can be used as a sketch-inspired way to interact with visualizations, proposes techniques and tools for incorporating key observed characteristics of sketching, such as its flexibility, into visualization interfaces.

In the opinion of the committee, Jagoda's dissertation combines novelty – by the opening up of new perspectives on the design of and interaction with information visualizations – with methodological care in the execution of exploratory studies on how information is sketched and Wizard-of-Oz studies that validate information synthesized from the exploratory studies. As noted by Dr. Sheelagh Carpendale, her supervisor, the overall contribution of Jagoda's dissertation, the leveraging of an understanding of sketches in support of thought as a guide to design of visualizations, is highly reminiscent of Bill Buxton's promotion of the importance of hand-drawn sketching to creativity and insight. The committee believes that the dissertation will inspire both designers of interactive visualizations and their tools, and future research in visual interactive systems.

Jagoda Walny earned her Ph.D. in Computer Science from the University of Calgary under the supervision of Dr. Carpendale. During her research, she interned at Microsoft Research; taught a fourth-year undergraduate course on Information Visualization at the University of Calgary; served as a reviewer for many Human-Computer Interaction conferences and journals; and organized workshops and tutorials for the research community.

For more information, please visit: http://research.jagoda.ca

Achievement Award 2017

**Canadian Human-Computer Communications Society /
Société canadienne du dialogue humain-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 2017 members of the Awards Committee are

The 2017 CHCCS/SCDHM Achievement Award of the Canadian Human-Computer Communications Society is presented to Dr. Kori Inkpen for her many contributions to the field of human-computer interaction (HCI), especially her work on collaboration technologies.

Kori Inkpen
Microsoft Research
CHCCS/SCDHM Achievement Award
Recipient 2017

Kori Inkpen is a Principal Researcher and Research Manager at Microsoft Research (MSR). After completing her B.Sc. in Computer Science & Mathematics in 1992 at Dalhousie University, she obtained a Ph.D. in Computer Science in 1997 from the University of British Columbia and then held a one-year NSERC Postdoctoral Fellowship at the Human Interface Technology Laboratory at the University of Washington. She became a faculty member in the School of Computing Science at Simon Fraser University in 1998 before moving to Dalhousie University in 2002 as Associate Professor and later Professor in the Faculty of Computer Science. In 2008, she joined Microsoft Research where she has held a number of positions. She currently manages the neXus group that explores Social Computing, Computer-Supported Collaborative Work, and Information Visualization.

Throughout her career, Kori's work has been characterized by her focus on designing and evaluating computer tools to support collaborative activity and her persistent mentorship of younger researchers. Her doctoral research was a key component of the Electronic Games for Education in Math and Science (E-GEMS) Project. She studied how computer game technology could be used to encourage young children to learn about mathematics and science by playing games together and how subtle changes in the user interface could affect the nature of the collaboration, especially when the affect was different for girls and boys. This began a long-term interest in working with children to better understand their use of technology, both to provide insights into how best to design user interfaces for children, but also to understand how insights gained from watching children explore technology might inform the design of technology for adults. During her doctoral research, she also began mentoring students, especially young women interested in computer science, something she has continued to do throughout her career.

As a new junior faculty member at Simon Fraser, she formed the Edge Lab, re-establishing a strong HCI research presence within the School of Computing Science. She and her students conducted research on a range of important emerging topics that have since become mainstream areas within the field of HCI, including further work with technology for children, early explorations of single-display groupware, and studies of the social aspects of multi-user tabletop collaboration and collaboration across mobile devices. Three of her SFU Edge Lab students are now HCI faculty members at Canadian universities. At Dalhousie, where she re-incarnated the Edge Lab, she expanded her research to look at a variety of interaction techniques for large wall-mounted and tabletop displays, issues of privacy and security specific to collaboration technology, and novel approaches to heterogeneous multi-display environments that integrate collaboration activity using personal handheld and larger shared displays. Again, several of the students who worked with her in the Dalhousie Edge Lab have since gone on to careers as HCI research faculty in Canadian universities.

After joining the staff at Microsoft Research, Dr. Inkpen's research shifted from focusing on co-location collaboration to exploring support for remote collaboration. She has continued to look at collaboration technology for children but also focuses on collaboration in the workplace, in the home, and in the general consumer space. She has examined factors affecting the success of video conferencing tools such as gaze, replay, spatialized audio, avatars, and embodied proxies, and has numerous contributions demonstrating the benefit of these advances. Beyond just improving today's videoconferencing systems, Dr. Inkpen has explored ways to move beyond traditional talking heads videoconferencing to support rich shared experiences and she has explored ways that people can attend events together, watch TV together, and go shopping together. More recently she has been investigating the potential of live video streaming to connect people in new ways. She has also assessed collaboration technology aimed at supporting social engagement for healthcare, learning, entertainment, and leisure time

activities. In addition to her many research achievements, she has continued her mentoring activities at MSR include hosting graduate, undergraduate, and high school interns within her research project teams.

Kori has been very active in efforts to support women in computing and in a number of initiatives to increase opportunities for Canadian HCI researchers to engage with each other. She organized the first "Imposter Syndrome" panel at the ACM Grace Hopper 2009 conference, which became a frequent event at Grace Hopper and has now extended beyond the initial panel to many different activities and events focused on women in technology. Kori was a founding member of the Network for Effective Collaboration Technologies through Advanced Research (NECTAR), an NSERC-funded strategic research network (2004-2008) that brought together researchers from six Canadian universities to focus on next-generation collaboration tools. She has been a regular participant in the annual Graphics Interface since 1997 when she presented her first paper, and has contributed to the conference in a number of ways: Program Committee Member for GI 2000, Local Arrangements Co-Chair for GI 2003, HCI Program Co-Chair for GI 2005, and Keynote Speaker for GI 2016.

Dr. Inkpen has published over 100 scientific papers in journals and conferences. She has been named in 20 patents that have been granted or are under review. She is a frequent invited keynote speaker at international conferences and has held numerous senior roles on conference program committees and organizing committees.

When not at work, Kori enjoys spending time with her family and friends, playing sports and travelling. She can often be found watching her daughter Gabi play volleyball, hanging out at the hockey rink with her son Declan, or at the gym with Lorenzo. Her favorite place to relax is at her cottage in Nova Scotia where she spends time every summer with her family.

Keynote Speaker

Karol Myszkowski
Max-Planck-Institut fuer Informatik

BIOGRAPHY

Karol Myszkowski is a senior researcher at the MPI Informatik, Saarbruecken, Germany. In the period from 1993 till 2000 he served as an associate professor in the Department of Computer Software at the University of Aizu, Japan. In the period from 1986 till 1992 he worked for Integra, Inc. a Japan-based, company specialized in developing rendering and global illumination software. He received his PhD (1991) and habilitation (2001) degrees in computer science from Warsaw University of Technology (Poland). In 2011 he was awarded with a lifetime professor title by the President of Poland. His research interests include global illumination and rendering, perception issues in graphics, high dynamic range imaging, and stereo 3D. He co-authored the book High Dynamic Range Imaging, and participated in various committees and editorial boards. He also co-chaired Rendering Symposium in 2001, ACM Symposium on Applied Perception in Graphics and Visualization in 2008, Spring Conference on Computer Graphics 2008, and Graphicon 2012.

For more information, please visit: https://people.mpi-inf.mpg.de/~karol/

Keynote Speaker

Sylvain Paris
Adobe Systems

Biography

Sylvain Paris is a researcher at Adobe Research in Cambridge
Massachusetts. Before that, he was a post-doc at MIT with
Frédo Durand and a student at INRIA in Grenoble with
François Sillion. His interests cover computational photog-
raphy and image processing. He has done several contribu-
tions to the field of photo and video editing, the goal being
to help novices and experts create better pictures and videos.
Some of the technology that he has invented is now available
in commercial software such as Photoshop and Lightroom.

Keynote Speaker

Exploiting Gaps in Human Perception for HCI: Three Trompe-l'oeil

Andy Wilson
Microsoft Research

Abstract

I will present three very different works in human computer interaction that play with our perception in surprising ways. Ostensibly, they address problems in interaction, but there is also an element of fun and pleasure to be experienced, or at the very least surprise. While in our field three exemplars is enough to lay claim to an unassailable generality, the three projects I will talk about are so radically different that a coherent theme would be a real stretch. Yet together they suggest how recent developments in sensing and display technologies allow us to manipulate the user's perception in new and evocative ways.

Biography

Andy Wilson is a Principal Researcher and Research Manager at Microsoft Research. There he has been applying sensing technologies to enable new modes of human-computer interaction. His interests include gesture-based interfaces, inertial sensing and display technologies. He helped found the Surface Computing group at Microsoft, and pioneered early efforts to commercialize depth cameras at Microsoft. Before joining Microsoft, Andy obtained his BA at Cornell University, and MS and PhD at the MIT Media Laboratory. He currently manages the Natural Interaction Research group at Microsoft Research

For more information, please visit: https://www.microsoft.com/en-us/research/people/awilson