

Clifton Forlines - Curriculum Vitae

Contact Information

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Employment History

- Research Scientist,
Research Associate**
July 2003-present
- Mitsubishi Electric Research Laboratories, Cambridge, MA.**
- Design and evaluate novel user interfaces.
 - Collaborate with MERL research teams to collect data from human subjects and conduct usability evaluations.
 - Collaborate with the company's business units to design new consumer products and new product features.
 - Produce written reports on research results and advanced development appropriate for publication in academic conferences.
 - Collaborate with Intellectual Property department to produce patent applications covering research results.
 - Manage research interns.
- HCI Consultant**
Dec. 2001-July 2003
- Mitsubishi Electric Research Laboratories, Cambridge, MA.**
- Collaborated with research teams to design and conduct usability evaluations of MERL projects.
 - Detailed functional specifications for new consumer product features as well as provided an interactive prototype of the products' user interface.
- Research Intern**
Summer 2000
- Walt Disney Imagineering, Glendale, CA.**
- Interned for Alan Kay.
 - Designed and implemented improvements to Squeak, an open-source, platform-independent, media authoring environment.
 - Improved user interface's consistency, observed Los Angeles area elementary school children using Squeak, and designed a method for deploying students' work on the Internet.
- Research Programmer**
Aug. 1999-May 2000
- Carnegie Mellon University, Pittsburgh, PA.**
- Member of Randy Pausch's Stage3 User Interface Group.
 - Led design, development, and user testing of Alice99, an easy-to-use software application for authoring interactive 3D worlds on the WWW.
 - Designed and implemented novel user interfaces and interaction techniques.
 - Collaborated with a team of programmers, artists, and designers to create VR environments showcased at SIGGRAPH99.

- Research Assistant** **Carnegie Mellon University**, Pittsburgh, PA.
May 1998-May 1999
- Member of a multi-disciplinary team of computer scientists and designers.
 - Built web-based educational software deployed at the Homewood Montessori School.
 - Employed iterative design strategies including prototyping, user testing, and revision.
- Art Director,** **Brysonweb Inc.**, Washington D.C.
DiningWeb Project
May 1996-May 1997
- Responsible for linking together Washington DC area restaurants with new patrons.
 - Assisted sales department as a technical consultant.
 - Explained the details of design and web hosting to potential clients.
 - Designed and implemented client websites.

Education

- 2009** **Doctorate of Philosophy**
Department of Computer Science, University of Toronto
Advisor: Ravin Balakrishnan
- 2001** **Master of Science in Human-Computer Interaction**
School of Computer Science, Carnegie Mellon University
- 2001** **Master of Science in Entertainment Technology**
School of Computer Science, Carnegie Mellon University
- 1999** **Bachelors of Fine Arts in Industrial Design**
College of Fine Arts, Carnegie Mellon University

Skills

- HCI & Evaluation** User testing, human factors, contextual inquiry and design, heuristic evaluation, cognitive walkthrough, think-aloud studies, and rapid prototyping.
- Technical** Java, C#, C++, Visual Basic, HTML, and a variety of digital tools.
- Miscellaneous** Conference/workshop organization, intern management

Professional Society Memberships

- March 2004 – present** Association for Computing Machinery (ACM)
- March 2004 – present** Institute of Electrical And Electronics Engineers (IEEE) Computer Society

Refereed Journal and Full Conference Paper Publications

- CHI 2009** Forlines, C., Balakrishnan, R. **Improving Visual Search through Image Segmentation.** *To appear at CHI 2009.*
(best paper nominee)
- CHI 2009** Wigdor, D., Jiang, H., Forlines, C., Borkin, M., Shen, C. **The WeSpace: The Design, Development and Deployment of a Walk-Up and Share Multi-Surface Visual Collaboration System.** *To appear at CHI 2009.*
- TABLETOP 2008** Jiang, H., Wigdor, D., Forlines, C., Shen, C. **System design for the WeSpace: Linking personal devices to a table-centered multi-user, multi-surface environment.** *Horizontal Interactive Human Computer Systems, 2008. TABLETOP 2008. 3rd IEEE International Workshop on, Amsterdam, The Netherlands, October 1-3, 2008, 97-104*
- AVI 2008** Brandl, P., Forlines, C., Wigdor, D., Haller, M., and Shen, C. 2008. **Combining and measuring the benefits of bimanual pen and direct-touch interaction on horizontal interfaces.** In *Proceedings of the Working Conference on Advanced Visual interfaces* (Napoli, Italy, May 28 - 30, 2008). AVI '08. ACM, New York, NY, 154-161.
- AVI 2008** Forlines, C. 2008. **Content aware video presentation on high-resolution displays.** In *Proceedings of the Working Conference on Advanced Visual interfaces* (Napoli, Italy, May 28 - 30, 2008). AVI '08. ACM, New York, NY, 57-64.
- CHI 2008** Forlines, C. and Balakrishnan, R. 2008. **Evaluating tactile feedback and direct vs. indirect stylus input in pointing and crossing selection tasks.** In *Proceeding of the Twenty-Sixth Annual SIGCHI Conference on Human Factors in Computing Systems* (Florence, Italy, April 05 - 10, 2008). CHI '08. ACM, New York, NY, 1563-1572.
- DIS 2008** Tse, E., Greenberg, S., Shen, C., Forlines, C., and Kodama, R. 2008. **Exploring true multi-user multimodal interaction over a digital table.** In *Proceedings of the 7th ACM Conference on Designing interactive Systems* (Cape Town, South Africa, February 25 - 27, 2008). DIS '08. ACM, New York, NY, 109-118.
- UIST 2007** Wigdor, D., Forlines, C., Baudisch, P., Barnwell, J., and Shen, C. 2007. **Lucid touch: a see-through mobile device.** In *Proceedings of the 20th Annual ACM Symposium on User interface Software and Technology* (Newport, Rhode Island, USA, October 07 - 10, 2007). UIST '07. ACM, New York, NY, 269-278.
- UIST 2007** Cao, X., Forlines, C., and Balakrishnan, R. 2007. **Multi-user interaction using handheld projectors.** In *Proceedings of the 20th Annual ACM Symposium on User interface Software and Technology* (Newport, Rhode Island, USA, October 07 - 10, 2007). UIST '07. ACM, New York, NY, 43-52.

- MULTIMEDIA 2007** Zwicker, M., Yea, S., Vetro, A., Forlines, C., Matusik, W., and Pfister, H. 2007. **Display pre-filtering for multi-view video compression**. In *Proceedings of the 15th international Conference on Multimedia* (Augsburg, Germany, September 25 - 29, 2007). MULTIMEDIA '07. ACM, New York, NY, 1046-1053.
- CHI 2007** Tse, E., Shen, C., Greenberg, S., and Forlines, C. 2007. **How pairs interact over a multimodal digital table**. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (San Jose, California, USA, April 28 - May 03, 2007). CHI '07. ACM Press, New York, NY, 215-218.
- CHI 2007** Forlines, C., Wigdor, D., Shen, C., and Balakrishnan, R. 2007. **Direct-touch vs. mouse input for tabletop displays**. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (San Jose, California, USA, April 28 - May 03, 2007). CHI '07. ACM Press, New York, NY, 647-656.
- CHI 2007** Wigdor, D., Shen, C., Forlines, C., and Balakrishnan, R. 2007. **Perception of elementary graphical elements in tabletop and multi-surface environments**. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (San Jose, California, USA, April 28 - May 03, 2007). CHI '07. ACM Press, New York, NY, 473-482.
- CG&A September/October, 2006** Shen, C., Ryall, K., Forlines, C., Esenther, A., Vernier, F. D., Everitt, K., Wu, M., Wigdor, D., Morris, M. R., Hancock, M., and Tse, E. 2006. **Informing the Design of Direct-Touch Tabletops**. *IEEE Comput. Graph. Appl.* 26, 5 (Sep. 2006), 36-46.
- CG&A September/October, 2006** Ryall, K., Esenther, A., Forlines, C., Shen, C., Shipman, S., Morris, M. R., Everitt, K., and Vernier, F. D. 2006. **Identity-Differentiating Widgets for Multiuser Interactive Surfaces**. *IEEE Comput. Graph. Appl.* 26, 5 (Sep. 2006), 56-64.
- UIST 2006** Wigdor, D., Leigh, D., Forlines, C., Shipman, S., Barnwell, J., Balakrishnan, R., and Shen, C. 2006. **Under the table interaction**. In *Proceedings of the 19th Annual ACM Symposium on User interface Software and Technology* (Montreux, Switzerland, October 15 - 18, 2006). UIST '06. ACM Press, New York, NY, 259-268.
- UIST 2006** Forlines, C., Vogel, D., and Balakrishnan, R. 2006. **HybridPointing: fluid switching between absolute and relative pointing with a direct input device**. In *Proceedings of the 19th Annual ACM Symposium on User interface Software and Technology* (Montreux, Switzerland, October 15 - 18, 2006). UIST '06. ACM Press, New York, NY, 211-220.
- CSCW 2006** Forlines, C., Shen, C., Wigdor, D., and Balakrishnan, R. 2006. **Exploring the effects of group size and display configuration on visual search**. In *Proceedings of the 2006 20th Anniversary Conference on Computer Supported Cooperative Work* (Banff, Alberta, Canada, November 04 - 08, 2006). CSCW '06. ACM Press, New York, NY, 11-20.

- CollabTech 2006** Wigdor, D., Shen, C., Forlines, C., Balakrishnan, R., (2006). **Table-centric interactive spaces for real-time collaboration: solutions, evaluation, and application scenarios**. Proceedings of CollabTech 2006, July 2006. p. 9-15.
- AVI 2006** Tse, E., Shen, C., Greenberg, S., and Forlines, C. 2006. **Enabling interaction with single user applications through speech and gestures on a multi-user tabletop**. In *Proceedings of the Working Conference on Advanced Visual interfaces* (Venezia, Italy, May 23 - 26, 2006). AVI '06. ACM, New York, NY, 336-343.
- PERVASIVE 2006** Tse, E., Greenberg, S., Shen, C., and Forlines, C. 2007. **Multimodal multiplayer tabletop gaming**. *Computers in Entertainment* 5, 2 (Apr. 2007), 12.
- CHI 2006** Wigdor, D., Shen, C., Forlines, C., and Balakrishnan, R. 2006. **Effects of display position and control space orientation on user preference and performance**. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (Montréal, Québec, Canada, April 22 - 27, 2006). R. Grinter, T. Rodden, P. Aoki, E. Cutrell, R. Jeffries, and G. Olson, Eds. CHI '06. ACM, New York, NY, 309-318.
- HRI 2006** Sidner, C. L., Lee, C., Morency, L., and Forlines, C. **The effect of head-nod recognition in human-robot conversation**. In *Proceeding of the 1st ACM SIGCHI/SIGART Conference on Human-Robot interaction* (Salt Lake City, Utah, USA, March 02 - 03, 2006). HRI '06. ACM Press, New York, NY, 290-296.
- TABLETOP 2006** Wu, M., Shen, C., Ryall, K., Forlines, C., Balakrishnan, R., **Gesture Registration, Relaxation, and Reuse for Multi-Point Direct-Touch Surfaces**, in *First IEEE International Workshop Proceedings of the Horizontal Interactive Human-Computer Systems, 2006. TableTop 2006*. (Adelaide, South Australia, 2006), pp 183-190.
- TABLETOP 2006** Everitt, K., Shen, C., Ryall, K., Forlines, C., **MultiSpace: Enabling Electronic Document Micro-mobility in Table-Centric, Multi-Device Environments** , in *First IEEE International Workshop Proceedings of the Horizontal Interactive Human-Computer Systems, 2006. TableTop 2006*. (Adelaide, South Australia, 2006), pp. 27-34.
- TABLETOP 2006** Ryall, K., Ringel Morris, M., Everitt, K., Forlines, C., Shen, C., **Experiences With and Observations of Direct-Touch Tables**, in *First IEEE International Workshop Proceedings of the Horizontal Interactive Human-Computer Systems, 2006. TableTop 2006*. (Adelaide, South Australia, 2006), pp 89-96.
- UIST 2005** Forlines, C., Balakrishnan, R., Beardsley, P., Baar, J.v. and Raskar, R., **Zoom-and-pick: facilitating visual zooming and precision pointing with interactive handheld projectors**. in *Proceedings of the 18th annual ACM symposium on User interface software and technology*, (Seattle, WA, USA, 2005), ACM Press, 73-82.

- UIST 2005** P.H., Harsham, B., Forlines, C., Leigh, D., Yerazunis, W., Shipman, S., Schmidt-Nielsen, B. and Ryall, K., **DT controls: adding identity to physical interfaces**. in *Proceedings of the 18th annual ACM symposium on User interface software and technology*, (Seattle, WA, USA, 2005), ACM Press, 245-252.
- INTERACT 2005** Forlines, C., Schmidt-Nielsen, B., Raj, B., Wittenburg, K. and Wolf, P., **A Comparison Between Spoken Queries and Menu-Based Interfaces for In-car Digital Music Selection**. in *Proceedings of Human-Computer Interaction - INTERACT 2005: IFIP TC13 International Conference*, (Rome, Italy, 2005), 536-549.
- GI 2005** Hancock, M. S., Shen, C., Forlines, C., and Ryall, K. 2005. **Exploring non-speech auditory feedback at an interactive multi-user tabletop**. In *Proceedings of the 2005 Conference on Graphics interface* (Victoria, British Columbia, 2005). ACM International Conference Proceeding Series, 41-50.
- IEEE CG&A 2005** Beardsley, P., Van Baar, J., Raskar, R., Forlines, C., **Interaction Using a Handheld Projector**, *IEEE Computer Graphics and Applications*, Volume 25 , Issue 1 (January 2005), pp. 39-43.
- CSCW 2004** Ryall, K., Forlines, C., Shen, C., and Morris, M. R. 2004. **Exploring the effects of group size and table size on interactions with tabletop shared-display groupware**. In *Proceedings of the 2004 ACM Conference on Computer Supported Cooperative Work* (Chicago, Illinois, USA, November 06 - 10, 2004). CSCW '04. ACM Press, New York, NY, 284-293.
- CHI 2004** Shen, C., Vernier, F. D., Forlines, C., and Ringel, M. 2004. **DiamondSpin: an extensible toolkit for around-the-table interaction**. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (Vienna, Austria, April 24 - 29, 2004). CHI '04. ACM Press, New York, NY, 167-174.
- ADCOG 2003** Forlines, C., Marks, J., Schmidt-Nielsen, B.: **Digi-Koi: A Game for Cell Phones**. In: *Proceedings of 2nd International Conference on Application and Development of Computer Games* (ADCOG 2003).
- SIGGRAPH 2003** Raskar, R., van Baar, J., Beardsley, P.A., Willwacher, T., Rao, S., and Forlines, C., **iLamps: Geometrically Aware and Self-Configuring Projectors**, *ACM Transactions on Graphics* (TOG), Volume 22, Issue 3, pp. 809-818.
- UIST 2003** Wittenburg, K., Forlines, C., Lanning, T., Esenther, A., Harada, S. and Miyachi, T., **Rapid serial visual presentation techniques for consumer digital video devices**. in *Proceedings of the 16th annual ACM symposium on User interface software and technology*, (Vancouver, Canada, 2003), ACM Press, 115-124.
- NIME 2002** Blaine, T., and Forlines, C., **JAM-O-WORLD: Evolution of the Jam-O-Drum Multi-player Musical Controller into the Jam-O-Whirl Gaming Interface**. in *Proceedings of the 2002 Conference on New Instruments for Musical Expression* (NIME-02), Dublin, Ireland, May 24-26, 2002.

- CSCW 2002** Shen, C., Lesh, N. B., Vernier, F., Forlines, C., and Frost, J. **Sharing and building digital group histories.** In *Proceedings of the 2002 ACM Conference on Computer Supported Cooperative Work* (New Orleans, Louisiana, USA, November 16 - 20, 2002). CSCW '02. ACM Press, New York, NY, 324-333.
- ICSLP 2002** Sidner, C.L., and Forlines, C., **Subset Languages for Conversing with Collaborative Interface Agents,** International Conference on Spoken Language Processing (ICSLP), September 2002.

Refereed Short Conference Paper and Journal Publications

- AVI 2008** Forlines, C. and Lilien, R. 2008. **Adapting a single-user, single-display molecular visualization application for use in a multi-user, multi-display environment.** In *Proceedings of the Working Conference on Advanced Visual interfaces* (Napoli, Italy, May 28 - 30, 2008). AVI '08. ACM, New York, NY, 367-371.
- AVI 2008** Matusik, W., Forlines, C., and Pfister, H. 2008. **Multiview user interfaces with an automultiscopic display.** In *Proceedings of the Working Conference on Advanced Visual interfaces* (Napoli, Italy, May 28 - 30, 2008). AVI '08. ACM, New York, NY, 363-366.
- CHI 2008** Jiang, H., Wigdor, D., Forlines, C., Borkin, M., Kauffmann, J., and Shen, C. 2008. **LivOlay: interactive ad-hoc registration and overlapping of applications for collaborative visual exploration.** In *Proceeding of the Twenty-Sixth Annual SIGCHI Conference on Human Factors in Computing Systems* (Florence, Italy, April 05 - 10, 2008). CHI '08. ACM, New York, NY, 1357-1360.
- UIST 2006** Forlines, C., Esenther, A., Shen, C., Wigdor, D., and Ryall, K. 2006. **Multi-user, multi-display interaction with a single-user, single-display geospatial application.** In *Proceedings of the 19th Annual ACM Symposium on User interface Software and Technology* (Montreux, Switzerland, October 15 - 18, 2006). UIST '06. ACM, New York, NY, 273-276.
- AVI 2006** Wigdor, D., Shen, C., Forlines, C., Balakrishnan, R. (2006). **Table-centric interactive spaces for real-time collaboration.** In *Proceedings of the 2006 International Working Conference on Advanced Visual Interfaces.* p. 103-107.
- UIST 2005** Forlines, C. and Shen, C. 2005. **DTLens: multi-user tabletop spatial data exploration.** In *Proceedings of the 18th Annual ACM Symposium on User interface Software and Technology* (Seattle, WA, USA, October 23 - 26, 2005). UIST '05. ACM Press, New York, NY, 119-122.
- INTERACT 2005** Forlines, C., Shen, C., Vernier, F. and Wu, M., **Under My Finger: Human Factors in Pushing and Rotating Documents Across the Table.** in *Proceedings of Human-Computer Interaction - INTERACT 2005: IFIP TC13 International Conference,* (Rome, Italy, 2005), 994-997.

- INTERACT 2005** Ryall, K., Esenther, A., Everitt, K., Forlines, C., Morris, M.R., Shen, C., Shipman, S. and Vernier, F., **iDwidgets: Parameterizing Widgets by User Identity**. in *Proceedings of Human-Computer Interaction - INTERACT 2005: IFIP TC13 International Conference*, (Rome, Italy, 2005), pp. 1124-1128.
- INTERACT 2005** Everitt, K., Shen, C., Ryall, K. and Forlines, C., **DocuBits and Containers: Providing e-Document Micro-mobility in a Walk-Up Interactive Tabletop Environment**. in *Proceedings of Human-Computer Interaction - INTERACT 2005: IFIP TC13 International Conference*, (Rome, Italy, 2005), 998-1001.
- CHI 2005** Forlines, C. Shen, C., and Buxton, B. **Glimpse: a novel input model for multi-level devices**. In *CHI '05 Extended Abstracts on Human Factors in Computing Systems* (Portland, OR, USA, April 02 - 07, 2005). CHI '05. ACM Press, New York, NY, 1375-1378.
- CHI 2005** Everitt, K., Shen, C., Ryall, K., and Forlines, C. 2005. **Modal spaces: spatial multiplexing to mediate direct-touch input on large displays**. In *CHI '05 Extended Abstracts on Human Factors in Computing Systems* (Portland, OR, USA, April 02 - 07, 2005). CHI '05. ACM Press, New York, NY, 1359-1362.
- CHI 2005** Shen, C., Hancock, M. S., Forlines, C., and Vernier, F. D., **CoR²Ds: Context-Rooted Rotatable Draggables for Tabletop Interaction**. In *CHI '05 Extended Abstracts on Human Factors in Computing Systems*, (Portland, OR, USA, April 02 - 07, 2005). CHI '05. ACM Press, New York, NY, 1781-1784.
- ICCE 2005** Divakaran, A., Forlines, C., Lanning, T., Shipman, S., and Wittenburg, K., **Augmenting Fast-forward and Rewind for Personal Digital Video Recorders**, International Conference on Consumer Electronics (ICCE), January 2005.
- CSCW 2004** Ringel Morris, M., Ryall, K., Shen, C., Forlines, C., and Vernier, F. 2004. **Beyond "social protocols": multi-user coordination policies for co-located groupware**. In *Proceedings of the 2004 ACM Conference on Computer Supported Cooperative Work* (Chicago, Illinois, USA, November 06 - 10, 2004). CSCW '04. ACM Press, New York, NY, 262-265.
- HLT 2004** Divi, V., Forlines, C., van Gemert, J. V., Raj, B., Schmidt-Nielsen, B., Wittenburg, K., Woelfel, J., Wolf, P.; and Zhang, F. **A Speech-In List-Out Approach to Spoken User Interfaces**. In *Proceedings of Human Language Technology Conference (HLT 2004)* (Boston, Massachusetts May 2-7, 2004). Association for Computational Linguistics, 2004, 113-116.
- CHI 2004** Ringel, M., Ryall, K., Shen, C., Forlines, C., and Vernier, F. 2004. **Release, relocate, reorient, resize: fluid techniques for document sharing on multi-user interactive tables**. In *CHI '04 Extended Abstracts on Human Factors in Computing Systems* (Vienna, Austria, April 24 - 29, 2004). CHI '04. ACM Press, New York, NY, 1441-1444.

- HCI International 2003** Wittenburg, K., Lanning, T., Forlines, C., & Esenther, A. (2003) **Rapid serial visual presentation techniques for visualizing a third data dimension**. In *Proceedings of HCI International 2003* (June, Crete, GREECE), Lawrence Erlbaum, Vol. 4, pp. 810-814.
- ACM SIGGRAPH Computer Graphics, May 2000** Pausch, R. and Forlines, C., **Alice: Model, Paint and Animate Easy-to-use Interactive Graphics for the Web**. *ACM SIGGRAPH Computer Graphics*, vol 34, no. 2, May 2000. pp. 42-43.

Workshop Papers, Invited Papers, Posters, and Presentations

- SPIE 2006** Forlines, C., Peker, K., and Divakaran, A. **Subjective assessment of consumer video summarization**. in *Proceedings of SPIE Conference Multimedia Content Analysis, Management and Retrieval*, Vol. 6073, pp. 170-177, January 2006.
- CSCW 2004** Ringel Morris, M., Forlines, C., Ryall, K., Shen, C., **Conflict Resolution in Paper and Digital Worlds: Two Surveys of User Expectations**, ACM Conference on Computer Supported Cooperative Work (CSCW), November 2004.
- CSCW 2004** Everitt, K., Forlines, C., Ryall, K., Shen, C., **Observations of a Shared Tabletop User Study**, ACM Conference on Computer Supported Cooperative Work (CSCW), November 2004.
- CVRV 2003** Raskar, R., van Baar, J., Beardsley, P.A., Forlines, C., Dietz, P.H., Esenther, A.W., Leigh, D.L., Ryall, K., Shen, C., Shipman, S.E., Yerazunis, W.S., **Intelligent Clusters and Collaborative Projector-based Displays**, NSF Workshop on Collaborative Virtual Reality and Visualization (CVRV), October 2003.
- CSCW 2002** Esenther, A.; Forlines, C.; Ryall, K.; Shipman, S., **DiamondTouch SDK: Support for Multi-User, Multi-Touch Applications**, Demo at the ACM Conference on Computer Supported Cooperative Work (CSCW), November 2002.
- UBICOMP 2002** Shen, C., Vernier, F., Forlines, C., and Lesh, N., **Around the Table**, Workshop on Collaboration with Interactive Walls and Tables.
- UIST 2002** Kelleher, C., Cosgrove, D., Culyba, D., Forlines, C., Pratt, J., and Pausch, R. **Alice2: Programming without Syntax Errors**. Demo at UIST 2002.
- SIGGRAPH '99: WWW 3D Roundup** Pausch, R., Forlines, C., Igarashi, T. **Teddy & Alice: Tools for the Novice Users of 3D Graphics**

Professional Activities

Reviewer	ACM CHI 2004-2009 ACM UIST 2006-2009 ACM CSCW 2004, 2006, 2008 ACM SigGraph 2008 IEEE InfoVis 2008 IEEE Vis 2008 ACM IUI 2006 Graphics Interface 2004, 2005, 2006 IEEE Journal of Computer Graphics & Applications Journal of HCI Handbook of Research on User Interfaces Design and Evaluation for Mobile Technology
Program Committee	ACM CHI 2009, papers ACM TEI 2008, papers ACM UIST 2006, posters
Organizing Committee	IEEE Tabletop 2009, tutorials co-chair ACM ICMI 2009, local-arrangements chair IEEE Tabletop 2008, finance chair IEEE Tabletop 2007, general co-chair

Patents and Public Applications

U.S. Patent 7,486,274	Method for stabilizing and precisely locating pointers generated by handheld direct pointing devices (with Ravin Balakrishnan)
U.S. Patent 7,441,202	Spatial multiplexing to mediate direct-touch input on large displays (with Chia Shen, Kate Everitt, and Kathy Ryall)
U.S. Patent 7,327,376	Multi-user collaborative graphical user interfaces (with Chia Shen and Frederic Vernier)
U.S. Patent 7,292,269	Context aware projector (with Paul Beardsley and Ramesh Raskar)
U.S. Patent 7,179,171	Fish breeding toy for cellular telephones (with Joseph Marks)
U.S. Patent 7,139,006	System and method for presenting and browsing images serially (with Alan Esenther, Thomas Lanning, and Kent Wittenburg)
U.S. Patent 6,764,185	Projector as an Input and Output Device (with Paul Beardsley, Dirk Brinkman, and Ramesh Raskar)
allowed	Context aware video conversion method and playback system
pending	Context Aware Image Conversion Method and Playback System (with Anthony Vetro)

- pending** **Inverted direct touch sensitive input devices** (with Daniel Wigdor, Chia Shen, John Barnwell, and Sam Shipman)

- pending** **Method and system for switching between absolute and relative pointing with direct input devices** (with Ravin Balakrishnan)

- pending** **Method and system for adapting a single-client, single-user application to a multi-user, multi-client environment** (with Alan Esenther, Chia Shen, Daniel Wigdor, and Kathy Ryall)

- pending** **Control system for differentiating multiple users** (with Paul Dietz, Bret Harsham, Sam Shipman, Darren Leigh, Bill Yerazunis, Bent Schmidt-Nielsen, and Kathy Ryall)

- pending** **Method and system for manipulating graphical objects displayed on a touch-sensitive display surface using displaced pop-ups** (with Fred Vernier, Chia Shen, and Mark Hancock)

- pending** **Spatial multiplexing to mediate direct-touch input on large displays** (with Chia Shen, Kate Everitt, and Kathy Ryall)

- pending** **Video presentation using compositional structures** (with Tom Lanning, Ajay Divakaran, Kadir Peker, Regunathan Radhakrishnan, and Ziyong Xiong)

- pending** **Method for editing graphics objects with multi-level input devices** (with Chia Shen)

- pending** **Conflict resolution for graphic multi-user interface** (with Meredith J. Ringel, Kathleen Ryall, Chia Shen, and Frederic Vernier)

- pending** **Hand gesture interaction with touch surface** (with Michael Wu, Chia Shen, and Kathleen Ryall)

- pending** **Method for rendering with composited images on cellular telephones** (with Joseph Marks)

Instillations

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| SIGGRAPH 2004:
Emerging Technologies | Interacting With Projections Using iLamp Projectors , demonstration applications running on interactive handheld projectors. |
| Ars Electronic Center
Linz, Austria | Jam-O-Drum: CircleMaze was invited to become part of the museum's permanent collection of interactive media. Gerfried Stocker, director of the Ars Electronica Center, cites the Jam-O-Drum as one of the museum's most popular exhibits. |
| Zeum Youth Art &
Technology Center
San Francisco, CA. | Jam-O-World Student lead for a team of graduate students from Carnegie Mellon's Entertainment Technology Center who developed two musical collaborative experiences for a one-year museum installation. |

SIGGRAPH 2001: Emerging Technologies **CircleMaze**, an interactive musical game that encourages collaboration.

SIGGRAPH '99: Emerging Technologies **Building Virtual Worlds**, Virtual Reality demonstrations of worlds built using *Alice*.

Software Development

Texas Instruments Member of a six person graduate student team that designed and developed an application that led to **StudyCards**, a flashcard like study aid for use in non-math and science classes. Texas Instruments now includes StudyCards with most of their handheld graphing calculators.

Alice *Alice* is a 3D Authoring system for non-programmers. The focus of the **Alice project** is now to provide the best possible first exposure to programming for students ranging from middle school to college students.