

Dr. Clifton Forlines – Curriculum Vitae

Address:
PO Box 571
Niagara Falls, NY 14304

email: cforlines@gmail.com
tel: (647) 745-2070
www: <http://www.cliftonforlines.com>

Employment History

- 2012-present* **Founder, Vice President of Software**
Tactical Labs, Toronto, ON.
- Collaborates with CEO and co-founders to provide research and business direction for the company.
 - Responsible for program management of company thrust to develop next-generation touch-sensor prototype.
 - Designs software architecture linking OS middleware to hardware components that accelerate touch interaction.
 - Authors and files patent applications in conjunction with the software and hardware research teams.
 - Interfaces with external vendors on the development and delivery of key system components.
- 2013-present* **Adjunct Professor**
Department of Computer Science, University of Toronto, Toronto, ON.
- Advises a number of PhD, MSc, and Postdoctoral students on their research and career development.
 - Conducts original research in the field of Human-Computer Interaction and prepares manuscripts for publication at academic conferences.
- 2011-present* **Expert Consultant and Trial Witness**
- Performs expert consulting for a number of organizations involved in multi-touch and interaction design patent litigation.
 - Produces reports on prior-art and patent validity.
 - Deposition and trial testimony experience in various domestic and international venues, including Federal Court and the International Trade Commission.
- 2010-2013* **Senior Software Engineer & Human-Centered Engineering Group Leader**
Draper Laboratory, Cambridge, MA.
- Group leader for the Human Centered Engineering group. Responsible for employee recruitment, matching group members with lab programs, and mentoring group members and visiting students.
 - Technical director for a 5.6M program on predictive analytics, forecast elicitation, and decision-support systems. Collaborates closely with academic partners at MIT, UIUC.
 - Conducts contextual interviews with sponsor organizations to identify gaps in existing tool sets and to design improvements to organizational processes.
 - Designs and evaluates user interfaces for device configuration and data analysis.
 - Collaborates with program managers to identify funding opportunities and authors proposals. Awarded grants include a 5.6M research and development program on predictive analytics, a 700K program on measuring the effectiveness of interactive tutoring systems on combating cognitive bias, and an 800K program on designing interactive tools to control complex analytic algorithms.
 - Led software team on 3.4M program to design and develop a multi-device system that includes desktop and embedded components. The system's configuration GUI is now used as a model for similar programs, and the program resulted in a fielded system.

- Performed Contextual Inquiry, user interface, and system/software architecture design for a mobile navigation and communication system for the US Air Force. The designed system is now fielded.

2001-
2010 **Research Scientist, Research Associate, HCI Consultant**
Mitsubishi Electric Research Laboratories, Cambridge, MA.

- Designed and evaluated novel user interfaces employing multi-touch input, multi-display workspaces, tabletop computing, large-display interaction, voice-input and information presentation methods.
- Authored and co-authored over 60 refereed conference and journal publications.
- Filed over 20 patent applications for original inventions in the fields of HCI and CS, 10 of which have been awarded.
- Collaborated with MERL research teams to collect data from human subjects and conduct usability evaluations on laboratory programs, ranging from in-car interfaces, to new display technologies, to novel image capture devices, to new methods of user input.
- Managed and co-managed 8 doctoral-student interns, two of whom are now associate professors, two of whom are now product managers at major IT firms, and one of whom is a research scientist at a top-tier industrial research and development lab.
- Collaborated with the company's business units to design functional specifications and interactive prototypes of new consumer products and new product features.

2000 **Intern**
Walt Disney Imagineering, Glendale, CA.

- Interned for Alan Kay in the Media Research Group
- Designed and implemented improvements to Squeak, an open-source, platform-independent, media authoring environment designed to support exploration and learning in grade-school and high-school children.
- Designed improvements to Squeak's user interface and developed method that allowed students using Squeak to share their work with classmates and friends on the Internet.

1999-
2000 **Research Programmer**
Carnegie Mellon University, School of Computer Science, Pittsburgh, PA.

- Member of Randy Pausch's Stage3 User Interface Group.
- TA for 3 graduate/undergraduate courses
- On several occasions, acted as a substitute lecturer
- Led design, development, and user testing of Alice99, an easy-to-use software application for authoring interactive 3D worlds on the WWW. Alice99 was downloaded ~100K times.
- Presented Alice99 authoring tool at SIGGRAPH99 3DWeb Roundup.
- 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.

1998-
1999 **Research Assistant**
Carnegie Mellon University, Department of Philosophy Pittsburgh, PA.

- Worked with a multi-disciplinary team of computer scientists and designers to design and implement on-line math and language teaching applications for the Homewood Montessori School.
- Worked with teachers to adapt the existing curriculum to an on-line format, and worked directly with grade-school students to test and refine the tools.

Education

- 2008 **Doctorate of Philosophy in Computer Science**
Department of Computer Science, University of Toronto
Thesis Title: User Interfaces that Improve Visual Search
Advisor: Ravin Balakrishnan
- 2001 **Master of Human-Computer Interaction**
School of Computer Science, Carnegie Mellon University
- 2001 **Master of Entertainment Technology**
School of Computer Science and College of Fine Arts, Carnegie Mellon University
- 1999 **Bachelors of Fine Arts in Industrial Design**
College of Fine Arts, Carnegie Mellon University

Trial Experience

- 10/2012- **Apple v. Samsung – Federal Court of Australia**
5/2013 Depositions.
Retained by Quinn Emanuel Urquhart & Sullivan, LLP (Contacts: Aileen Kim)
- 3/2012- **Confidential Work – International Venue**
4/2012
- 10/2011- **Apple v. Samsung – US District Court for the Northern District of California, San**
8/2012 **Jose Division, case no. 11-cv-01846**
Deposition and Testimony at hearing.
Retained by Quinn Emanuel Urquhart & Sullivan, LLP (Contacts: Aileen Kim, Mark Tung)
- 9/2011- **Apple v. HTC – US International Trade Commission, Washington DC, Investigation**
8/2012 **no. 337-TA-797**
Claim Mapping, Deposition, and Testimony at hearing.
Retained by Quinn Emanuel Urquhart & Sullivan, LLP (Contacts: Patrick Curran, Jim Glass)
- 11/2011- **HTC v. Apple – UK High Court of Justice**
9/2012 Prior Art Search, Claim Mapping, and Deposition.
Retained by Powell Gilbert, LLP (Contacts: Tom Oliver)

Student Supervision

- 2013- **Ricardo Jota, Postdoctoral Scholar, University of Toronto**
present Advises and provides research direction. See [RF.44, RF.43].
- 2012 **Leslie Guelcher and Robert Bruzzi, Research Assistants, Mercyhurst University**
Supervised graduate research work on user study design and execution. See [RF.42].
- 2012 **Jordan Lynch, Summer Intern, US Naval Academy**
Co-advised intern at Draper Laboratory with John Irvine.
Jordan is currently an upperclassman at the Naval Academy.
- 2011 **Jennifer Tsai, Research Intern, University of Illinois at Urbana-Campaign**
Co-advised intern at Draper Laboratory with Sarah Miller.

- 2007 **Peter Brandl, Research Intern, Upper Austria University of Applied Science**
Co-advised intern at Mitsubishi Electric Research Labs with Chia Shen and Daniel Wigdor. See [RF.36]
Peter is currently a PhD candidate at Johannes Kepler University.
- 2007 **Hao Jiang, Research Intern, Tsinghua University**
Co-advised intern at Mitsubishi Electric Research Labs with Chia Shen and Daniel Wigdor. See [RF.37, RF.38, RS.16].
- 2006-2008 **Daniel Wigdor, Research Intern, University of Toronto**
Co-advised intern at Mitsubishi Electric Research Labs with Chia Shen. See [RF. 38, RF. 37, RF. 36, RF. 32, RF. 28, RF. 27, RF. 26, RF. 24, RF. 22, RF. 21, RF. 18, RS. 16, RS. 15, RS. 14].
Daniel is currently an Associate Professor in the Department of Computer Science at the University of Toronto.
- 2006-2007 **Ed Tse, Research Intern, University of Calgary**
Co-advised intern at Mitsubishi Electric Research Labs with Chia Shen. See [RF. 33, RF. 29, RF. 26, RF. 20, RF. 19].
Ed is now a Project Leader at Smart Technologies.
- 2004 **Meredith Ringel Morris, Research Intern, Stanford University**
Co-advised intern at Mitsubishi Electric Research Labs with Chia Shen. See [RF. 14, RF. 7, RS. 5, RS. 3].
Merry is currently a researcher at Microsoft Research and an affiliate associate professor in the Department of Computer Science and Engineering at the University of Washington.
- 2004 **Mark Hancock, Research Intern, University of Calgary**
Co-advised intern at Mitsubishi Electric Research Labs with Chia Shen. See [RF. 26, RF. 10, RS. 7].
Mark is currently an Assistant Professor in the Department of Management Sciences at the University of Waterloo.
- 2004 **Kate Everitt, Research Intern, University of Washington**
Co-advised intern at Mitsubishi Electric Research Labs with Chia Shen. See [RF. 26, RF. 25, RF. 15, RF. 14, RS. 11, RS. 10, RS. 8].
Kate is currently a program manager at Microsoft.
- 2003 **Mike Wu, Research Intern, University of Toronto**
Co-advised intern at Mitsubishi Electric Research Labs with Chia Shen. See [RF. 26, RF. 16, RS. 12]
Mike is currently working at CTO Loupe.

Refereed Journal and Full Conference Paper Publications

- [RF. 44] Darren Leigh, Clifton Forlines, Ricardo Jota, Steven Sanders, and Daniel Wigdor. 2014. **High Rate, Low-Latency Multi-Touch Sensing with Simultaneous Orthogonal Multiplexing.** In *Proceedings of the 27th Annual ACM Symposium on User Interface Software and Technology* (Honolulu, Hawaii, USA, October 05 - 08, 2014). UIST '14. ACM, New York, NY. *To appear.*

- [RF. 43] Haijun Xia, Ricardo Jota, Benjamin McCanny, Zhe Yu, Clifton Forlines, Karan Singh, and Daniel Wigdor. 2014. **Zero-Latency Tapping: Using Hover Information to Predict Touch Locations and Eliminate Touchdown Latency.** In *Proceedings of the 27th Annual ACM Symposium on User interface Software and Technology* (Honolulu, Hawaii, USA, October 05 - 08, 2014). UIST '14. ACM, New York, NY. *To appear.*
- [RF. 42] Clifton Forlines, Sarah Miller, Leslie Guelcher, and Robert Bruzzi. 2014. **Crowdsourcing the future: predictions made with a social network.** In *Proceedings of the 32nd annual ACM conference on Human factors in computing systems* (CHI '14). ACM, New York, NY, USA, 3655-3664.
- [RF. 41] Garrett Weinberg, Bret Harsham, Clifton Forlines, and Zeljko Medenica. 2010. **Contextual push-to-talk: shortening voice dialogs to improve driving performance.** In *Proceedings of the 12th international conference on Human computer interaction with mobile devices and services* (MobileHCI '10). ACM, New York, NY, USA, 113-122.
- [RF. 40] Clifton Forlines and Kent Wittenburg. 2010. **Wakame: sense making of multi-dimensional spatial-temporal data.** In *Proceedings of the International Conference on Advanced Visual Interfaces* (AVI '10), Giuseppe Santucci (Ed.). ACM, New York, NY, USA, 33-40.
- [RF. 39] Forlines, C. and Balakrishnan, R. 2009. **Improving visual search with image segmentation.** In *Proceedings of the 27th international Conference on Human Factors in Computing Systems* (Boston, MA, USA, April 04 - 09, 2009). CHI '09. ACM, New York, NY, 1093-1102. (best paper nominee)
- [RF. 38] 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.** In *Proceedings of the 27th international Conference on Human Factors in Computing Systems* (Boston, MA, USA, April 04 - 09, 2009). CHI '09. ACM, New York, NY, 1093-1102.
- [RF. 37] 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*
- [RF. 36] 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.
- [RF. 35] 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.
- [RF. 34] 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.

- [RF. 33] 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.
- [RF. 32] 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.
- [RF. 31] 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.
- [RF. 30] 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.
- [RF. 29] 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.
- [RF. 28] 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.
- [RF. 27] 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.
- [RF. 26] 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.
- [RF. 25] 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.
- [RF. 24] 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.
- [RF. 23] 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.

- [RF. 22] 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.
- [RF. 21] 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.
- [RF. 20] Tse, E., Shen, C., Greenberg, S., and Forlines, C. 2006. In Proceedings of the 27th international Conference on Human Factors in Computing Systems (Boston, MA, USA, April 04 - 09, 2009). CHI '09. ACM, New York, NY, 1093-1102. (best paper nominee). In Proceedings of the Working Conference on Advanced Visual interfaces (Venezia, Italy, May 23 - 26, 2006). AVI '06. ACM, New York, NY, 336-343.
- [RF. 19] Tse, E., Greenberg, S., Shen, C., and Forlines, C. 2007. **Multimodal multiplayer tabletop gaming**. Computers in Entertainment 5, 2 (Apr. 2007), 12.
- [RF. 18] 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.
- [RF. 17] 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.
- [RF. 16] 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.
- [RF. 15] 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.
- [RF. 14] 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.
- [RF. 13] 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.

- [RF. 12] 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.
- [RF. 11] 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.
- [RF. 10] 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.
- [RF. 9] 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.
- [RF. 8] 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.
- [RF. 7] 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.
- [RF. 6] 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).
- [RF. 5] 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.
- [RF. 4] 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.
- [RF. 3] 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.
- [RF. 2] 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.

- [RF. 1] 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 Journal and Conference Paper Publications

- [RS. 21] Forlines, C., Miller, S., Prakash, S., and Irvine, J. (2012). **Heuristics for Improving Forecast Aggregation**. *Machine Aggregation of Human Judgment: AAAI-12 Fall Symposium*. Arlington, Virginia, November 2-4, 2012.
- [RS. 20] Miller, S., Forlines, C., and Regan, J. (2012) **Exploring the Relationship Between Topic Area Knowledge and Forecasting Performance**. In *Proceedings of the 56th Annual Meeting of the Human Factors and Ergonomics Society*.
- [RS. 19] Poore, J., Regan, J., Miller, S., Forlines, C., and Irvine, J. (2012) **Fine Distinctions Within Cognitive Style Predict Forecasting Accuracy**. In *Proceedings of the 56th Annual Meeting of the Human Factors and Ergonomics Society*
- [RS. 18] 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.
- [RS. 17] 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.
- [RS. 16] 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.
- [RS. 15] 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.
- [RS. 14] 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.
- [RS. 13] 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.

- [RS. 12] 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.
- [RS. 11] Ryall, K., Esenther, A., Everitt, K., Forlines, C., Morris, M.R., Shen, C., Shipman, S. and Vernier, F., **iDwidgets: Parameterizing Widgets by User Identity** *Proceedings of Human-Computer Interaction - INTERACT 2005: IFIP TC13 International Conference.* in, (Rome, Italy, 2005), pp. 1124-1128.
- [RS. 10] 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.
- [RS. 9] 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.
- [RS. 8] 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.
- [RS. 7] 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.
- [RS. 6] 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.
- [RS. 5] 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.
- [RS. 4] 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.
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Professional Service

Program Committees	<p>ACM TIS: Program Committee (2013) <i>Tabletops and Interactive Surfaces</i></p> <p>ACM CHI: Program Committee (2009, 2012, 2014) <i>Human Factors in Computing Systems</i></p> <p>ACM UIST: Program Committee (2012,2014) <i>User Interface Software & Technology</i></p> <p>ACM TEI: Program Committee (2008) <i>Tangible, Embedded and Embodied Interaction</i></p> <p>ACM UIST: Posters (2006) <i>User Interface Software & Technology</i></p>
Invited Reviews	<p>ACM TOCHI: Papers (2012) <i>Transactions on Computer-Human Interaction</i></p> <p>ACM CHI: Papers & Notes (2003-2014) <i>Human Factors in Computing Systems</i></p> <p>ACM UIST: Papers & Notes (2003-2014) <i>User Interface Software & Technology</i></p> <p>ACM TEI: Papers & Notes (2008-2014) <i>Tangible, Embedded and Embodied Interaction</i></p> <p>ACM CSCW: Papers & Notes (2004- 2010) <i>Computer Supported Collaborative Work</i></p> <p>ACM SIGGRAPH: Papers & Notes (2008) <i>Computer Graphics</i></p> <p>IEEE INFOVIS: Papers & Notes (2008) <i>Information Visualization</i></p> <p>IEEE VIS: Papers & Notes (2008) <i>Visualization</i></p> <p>ACM IUI: Papers (2006) <i>Intelligent User Interfaces</i></p> <p>Graphics Interface: Papers (2004,2005,2006)</p> <p>IEEE Journal of Computer Graphics & Applications</p> <p>Journal of HCI</p> <p>Handbook of Research on User Interfaces Design and Evaluation for Mobile Technology</p> <p>IEEE CG&A (2006) <i>IEEE Computer Graphics and Applications</i></p>
Organization	<p>ACM UIST (2009-11,13-14) Proceedings Chair</p> <p>IEEE Tabletop (2009) Tutorials Co-chair</p> <p>ACM ICMI (2009) Local-arrangements Chair</p> <p>IEEE Tabletop (2008) Finance Chair</p> <p>IEEE Tabletop (2007) General Co-chair</p>

Patents

- U.S. Patent 6,764,185** **Projector as an Input and Output Device** (with Paul Beardsley, Dirk Brinkman, and Ramesh Raskar)
- 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 7,179,171** **Fish breeding toy for cellular telephones** (with Joseph Marks)
- U.S. Patent 7,292,269** **Context aware projector** (with Ramesh Raskar and Paul Beardsley)
- U.S. Patent 7,327,376** **Multi-user collaborative graphical user interfaces** (with Chia Shen and Frederic Vernier)
- 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 7,486,274** **Method for stabilizing and precisely locating pointers generated by handheld direct pointing devices** (with Ravin Balakrishnan)
- U.S. Patent 7,526,725** **Context aware video conversion method and playback system**
- U.S. Patent 7,640,518** **Method and system for switching between absolute and relative pointing with direct input devices** (with Ravin Balakrishnan)
- U.S. Patent 7,773,099** **Context aware image conversion method and playback system** (with Anthony Vetro)
- public application** **Hybrid System and Methods for Low-Latency User Input Processing and Feedback** (with Daniel Wigdor, Steven Sanders, and Ricardo Costa)
- public application** **Interface for Remote Controllers**
- public application** **Method for Presenting Images to Identify Target Objects**
- public application** **Inverted direct touch sensitive input devices** (with Daniel Wigdor, Chia Shen, John Barnwell, and Sam Shipman)
- public application** **Method and system for switching between absolute and relative pointing with direct input devices** (with Ravin Balakrishnan)
- public application** **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)
- public application** **Control system for differentiating multiple users** (with Paul Dietz, Bret Harsham, Sam Shipman, Darren Leigh, Bill Yerazunis, Bent Schmidt-Nielsen, and Kathy Ryall)
- public application** **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)
- public application** **Video presentation using compositional structures** (with Tom Lanning, Ajay Divakaran, Kadir Peker, Regunathan Radhakrishnan, and Ziyong Xiong)
- public application** **Method for editing graphics objects with multi-level input devices** (with Chia Shen)
- public application** **Conflict resolution for graphic multi-user interface** (with Meredith J. Ringel, Kathleen Ryall, Chia Shen, and Frederic Vernier)

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

public application **Method for rendering with composited images on cellular telephones**
(with Joseph Marks)

Demos and Museum Installations

SIGGRAPH 2004: **Interacting With Projections Using iLamp Projectors**, demonstrated
Emerging Technologies applications running on interactive handheld projectors.

Ars Electronic Center **Jam-O-Drum: CircleMaze** was invited to become part of the museum's
Linz, Austria 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 **Jam-O-World** Student lead for a team of graduate students from Carnegie
San Francisco, CA. Mellon's Entertainment Technology Center who developed two musical
collaborative experiences for a one-year museum installation.

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

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