

Christopher L. North – Curriculum Vitae

(updated Sept 2014)

Department of Computer Science
114 McBryde Hall
Virginia Tech
Blacksburg, VA 24061-0106

(540) 231-2458
(540) 231-9218 fax
north@vt.edu
<http://www.cs.vt.edu/~north/>

Google Scholar:

- <http://scholar.google.com/citations?user=yBZ7vtkAAAAJ>
- h-index = 35

Short Bio:

Dr. Chris North is a Professor of Computer Science at Virginia Tech. He is Associate Director of the Discovery Analytics Center, and leads the Visual Analytics research group. He is principle architect of the GigaPixel Display Laboratory, one of the most advanced display and interaction facilities in the world. He also participates in the Center for Human-Computer Interaction, and the Hume Center for National Security, and is a member of the DHS supported VACCINE Visual Analytics Center of Excellence. He was awarded Faculty Fellow of the College of Engineering in 2007, and the Dean's Award for Research Excellence in 2014. He earned his Ph.D. at the University of Maryland, College Park, in 2000.

He has served as General Co-Chair of IEEE VisWeek 2009, and as Papers Chair of the IEEE Information Visualization (InfoVis) and IEEE Visual Analytics Science and Technology (VAST) Conferences. He has served on the editorial boards of IEEE Transactions on Visualization and Computer Graphics (TVCG), the Information Visualization journal, and Foundations and Trends in HCI.

He has been awarded over \$6M in grants, co-authored over 100 peer-reviewed publications, and delivered 3 keynote addresses at symposia in the field. He has graduated 8 Ph.D. and 14 M.S. thesis students, 4 receiving outstanding research awards at Virginia Tech, and advised over 70 undergraduate research students including several award winners at Virginia Tech's annual undergraduate research symposium.

His research seeks to enable people to interactively visualize and explore big data for discovering new insights, by establishing usable, effective, and scientifically-grounded methods for visual interaction. His current research themes focus on (1) creating powerful interactions for computational analytics that respond to human cognitive sensemaking activity, and (2) exploiting large high-resolution displays to create rich embodied-interactive spaces.

Research and Teaching Interests:

- *Areas:* Visual Analytics, Information Visualization, Human-Computer Interaction
- *Basic research:* Large high-resolution displays and interaction techniques; display ecologies; combining visualization and data mining; visual text analytics and sensemaking; insight-based evaluation of visualization; multiple-view techniques; visualization usability; usability of data mining.
- *Applied domains:* Intelligence analysis, cyber security, geographic info, bioinformatics.

Position:

- Professor of Computer Science, Virginia Polytechnic Institute and State University, June 2014 – present
- Associate Professor of Computer Science, Virginia Polytechnic Institute and State University, June 2006 – June 2014
- Assistant Professor of Computer Science, Virginia Polytechnic Institute and State University, August 2000 – June 2006
- Sabbaticals as Visiting Researcher:
 - Sandia National Laboratories, Cyber Engineering Research Lab, January 2013 – May 2013
 - Pacific Northwest National Laboratories, National Visual Analytics Center, January 2009 – May 2009
 - Microsoft Research, August 2008 – December 2008

Education:

- **University of Maryland**, College Park, MD
Ph.D., Computer Science, May 2000
Dissertation: “A User Interface for Coordinating Visualizations based on Relational Schemata: Snap-Together Visualization”
Advisor: Dr. Ben Shneiderman
Committee: Dr. Ben Bederson, Dr. David Mount, Dr. Kent Norman, Dr. Adam Porter
- **University of Maryland**, College Park, MD
M.S., Computer Science, December 1995
- **Carnegie Mellon University**, Pittsburgh, PA
B.S. with University Honors, Computer Science / Mathematics, May 1992

Awards:

- **Dean's Award for Excellence in Research**, College of Engineering, Virginia Tech, May 2014.
- Grand Prize Award, Yelp Dataset Challenge, Yelp Inc., 2013. For submission: “Clustered Layout Word Cloud for User Generated Review.” Ji Wang, Jian Zhao, Sheng Guo, Chris North, Naren Ramakrishnan, Virginia Tech and University of Toronto.
- Honorable Mention Award, *VAST Challenge, IEEE VisWeek*, Oct 2012.
- Scholar of the Week, Virginia Tech, July 23, 2012.
- Challenge Award, *VAST Challenge, IEEE VisWeek*, Oct 2011.
- Best Paper Honorable Mention Award, *ACM Conference on Human Factors in Computing Systems (CHI)*, April 2010. For article: C. Andrews, A. Endert, C. North, "Space to Think: Large, High-Resolution Displays for Sensemaking".
- Top Cited Article in 2005-2010 Award, *Computers & Graphics* journal, Elsevier. For article: Robert Ball, Chris North, “Realizing embodied interaction for visual analytics through large displays”, *Computers & Graphics*, 31(3): 380-400, June 2007. Awarded 2010.
- Service Award, *IEEE Computer Society*, October 2009. For service as General Co-Chair of VisWeek 2009 Conference.
- Award for Special Contributions, *VAST Challenge, IEEE VAST 2009 Conference*, October 2009.
- **Faculty Fellow** Award, College of Engineering, Virginia Tech, May 2007.

- Best Paper Honorable Mention award, *ACM Conference on Human Factors in Computing Systems (CHI)*, April 2007. For article: R. Ball, C. North, D. Bowman, "Move to Improve: Promoting Physical Navigation to Increase user Performance with Large Displays".
- Best Panel Award, *IEEE Visualization Conference*, October 2006. For panel: T.J. Jankun-Kelly, R. Kosara, G. Kindlmann, C. North, C. Ware, E.W. Bethel, "Is There Science in Visualization?".
- Best student-authored paper award, *Human Factors and Ergonomics Society 47th Annual Meeting (HFES)*, Oct. 2003. For article: Y.S. Ryu, B. Yost, G. Convertino, J. Chen, C. North, "Exploring Cognitive Strategies for Integrating Multiple-View Visualizations".
- Director's Award for Innovation, U.S. Bureau of the Census, May 2000.
- ACM CHI'98 Doctoral Consortium, Conference Scholarship, April 1998.
- U.S. National Library of Medicine, 2-year Graduate Fellowship, September 1994 - August 1996.
- Eastman Kodak Company, 2-year Full-Tuition Scholarship Award, August 1990 - May 1992.
- Dean's List, Carnegie Mellon University, 3 semesters.

Awards to Graduate Research Advisees:

- Lauren Bradel (PhD advisee), 2nd Place Best Poster Award, Graduate Poster Showcase, Department of Computer Science, April 2014.
- Andre Esakia (PhD advisee), Outstanding GTA Award, Department of Computer Science, April 2014.
- Alex Endert (PhD advisee), **Best Doctoral Dissertation Award, IEEE Computer Society's Visualization and Graphics Technical Committee (VGTC)**, presented at the IEEE VIS Conference, October 2013.
- Alex Endert (PhD advisee), Outstanding PhD Dissertation Award, Department of Computer Science, May 2013.
- Jessica Self (PhD advisee), Davenport Fellowship Award, Virginia Tech, 2011, 2013.
- Jessica Self (PhD advisee), Pratt Fellowship & Walts Fellowship Award, Virginia Tech, 2012.
- Lauren Bradel (PhD advisee), Hume Center and IC-CAE Intelligence Community Fellowship Award, 2012-2014.
- Alex Endert (PhD advisee), selected as TEDxVirginiaTech presenter, 2012.
- Alex Endert (PhD advisee), Davenport Fellowship Award, Virginia Tech, 2010 and 2011.
- Lauren Shupp (MS advisee), Outstanding Master's Thesis Award, Department of Computer Science, May 2007; Nominated by Virginia Tech for the Conference of Southern Graduate Schools 2007 Innovative Application of Technology in a Master's Thesis Award, 2007.
- Nicholas Polys (PhD advisee), Outstanding PhD Dissertation Award, Department of Computer Science, May 2006.
- Glenn Fink (PhD advisee), NSF IGERT graduate fellowship award, 2004-2006.
- Nathan Conklin (MS advisee), Outstanding Master's Thesis Award, Department of Computer Science, May 2002.

Awards to Undergraduate Research Advisees:

- Lauren Gibboney, Society of Women Engineers (SWE) and College of Engineering Scholarship, 2012.
- Kristen Koch, Undergraduate Research Award, VTURCS Symposium, 2012.

- David Machaj, Scott Connor, and Ron Forbes, 1st place Faculty Choice Undergraduate Research Award, 3rd Place People’s Choice Undergraduate Research Award, VTURCS Symposium, 2007.
- Matt Witherspoon, 3rd Place Undergraduate Research Award, VTURCS Symposium, 2006.
- Andrew Sabri, People’s Choice Undergraduate Research Award, VTURCS Symposium, 2005; 1st Place Undergraduate Research Award, VTURCS Symposium, 2006.
- Paul Muessig, Faculty Choice Undergraduate Research Award, VTURCS Symposium, 2005.

Externally Funded Research: (26 grants total = \$6,320,344. Personal share = \$2,826,303)

1. *NSF*, “BIGDATA: F: DKA: Usable Big Data Analytics via Multi-Scale Visual to Parametric Interaction (MV2PI)”, C. North, S. Leman, L. House, Y. Cao. 9/2014 – 9/2017. Total: \$998,912. Personal share: \$249,278 (25%).
2. *L-3 STRATIS*, “Discovering Coordinated Malicious Activity and Network Usage Patterns”, C. North, N. Ramakrishnan. 7/2014 – 7/2015. Total: \$56,610. Personal share: \$27,805 (50%).
3. *PNNL*, “Display Ecologies and Large-Scale Graph Visualization”, Chris North, Yong Cao. 9/2013 – 6/2014. Total: \$117,548. Personal share: \$58,774 (50%).
4. *L-3 STRATIS*, “Visual Analytics for Cyber Security”, C. North. 1/2013 – 6/2014. Total: \$200,885. Personal share: \$200,885 (100%).
5. *NSF TUES*, “Critical Thinking with Data Visualization (CTDV)”, L. House, S. Leman, C. North, N. Ramakrishnan, K. McConnell. 1/2013 – 12/2015. Total: \$199,943. Personal share: \$39,987 (20%).
6. *NSF HCC*, “Semantic Interaction for Visual Text Analytics”, C. North. 9/2012 - 8/2015. Total: \$516,000. Personal share: \$516,000 (100%).
7. *DDL OMNI Engineering LLC*, “STTR: Information Salience”, C. North, S. Leman. 6/2012 – 12/2012. Total: \$43,957. Personal share: \$32,968 (75%).
8. *S2ERC (NSF I/UCRC & L-3 STRATIS)*, “Large Displays For Cyber Analytics”, C. North. 2/2012 - 1/2014. Total: \$35,000. Personal share: \$35,000 (100%).
9. *NSF CRI*, “II-EN: Device and Display Ecologies”, F. Quek, T. Martin, C. North, T. Smith-Jackson, D. Bowman, D. Gracanin, M. Evans. 5/2011 - 5/2014. Total: \$600,000. Personal share: \$78,000 (13%).
10. *NSF DUE*, “Advancing Personalized Engineering Learning Via An Adaptive Concept Map”, C. Williams, A. Johri, C. North. 4/2011 – 3/2014. Total: \$198,753. Personal share: \$59,625 (30%).
11. *NIA (FAA)*, “Continuous Adaptive Planning to Support Gate-to-Gate Management: Human Factors Issues”, C. North. 1/2011 – 11/2012. Total: \$135,000. Personal share: \$135,000 (100%).
12. *Agilent Technologies*, “GigaPixel Visualization for Bioinformatics”, C. North. 1/2011 – 12/2011. Total: \$23,250. Personal share: \$23,250 (100%).
13. *DHS VACCINE (Visual Analytics Center of Excellence), sub to Purdue University*. “Co-Located Collaborative Visual Analytics on Large, High-Resolution Displays”, C. North. 12/2010 – 7/2012. Total: \$40,000. Personal share: \$40,000 (100%).
14. *NSF*, “User-Guided Spatializations for Visualizing NSF Award Portfolios”, C. North, S. Leman, L. House. 5/2010 – 11/2010. Total: \$24,900. Personal share: \$14,940 (60%).

15. *NSF FODAVA*, “Formal Models, Algorithms, and Visualizations for Storytelling Analytics”, N. Ramakrishnan, C. North, F. Quek. 10/2009 - 10/2014. Total: \$710,100. Personal share: \$248,535 (35%).
16. *NSF FODAVA*, “Bayesian Analysis in Visual Analytics”, S. Leman, L. House, C. North. 10/2009 - 10/2013. Total: \$499,307. Personal share: \$99,861 (20%).
17. *NSF*, “SGER: DL-VT416: A Digital Library Testbed for Research Related to 4/16/07 at Virginia Tech”, E. Fox, P. Fan, C. North, N. Ramakrishnan, D. Shoemaker. 5/2007 – 1/2009. Total: \$211,993. Personal share: \$42,399 (20%).
18. *NSF CRI*, “Interfaces for the Embodied Mind”, F. Quek, W. Winchester, Y. Xiong, D. Tatar, D. Bowman; C. North (Sr. Pers.), et al. 4/2006 – 4/2008. Total: \$416,000. Personal share: \$20,800 (5%).
19. *NSF HCC*, “SGER: Designing Scalable Interactive Information Visualizations on High Resolution Displays”, C. North. 4/2006 - 9/2007. Total: \$99,883. Personal share: \$99,883 (100%).
20. *NuTech Inc. (for IARPA)*, “Geographic Data Visualization on High-Resolution Displays”, C. North. 3/2006 – 12/2006. Total: \$41,500. Personal share: \$41,500 (100%).
21. *NIST*, “Flexible and Extensible Multivariate Data Visualization: Toward a Collaboratory for Sharing Data Findings”, S. McCrickard, C. North, D. Neale. 7/2005-5/2007. Total: \$109,729. Personal share: \$43,892 (40%).
22. *ARDA & NGA (National Geospatial-intelligence Agency)*, “Ultra-High Resolution Interactive Information Visualization”, C. North, L. Carstensen. 2/2005 – 5/2010. Total: \$708,016. Personal share: \$566,413 (80%).
23. *NSF RR*, “Towards Unbounded Display: Developing a Reconfigurable Research Testbed for Large-scale, High-resolution Visual Displays”, C. North, D. Bowman, R. Ehrich, S. Harrison. 8/2004 – 7/2009. Total: \$242,067. Personal share: \$60,517 (25%).
24. *Agilent Technologies*, “Visualization Schemas for Bioinformatics”, C. North, 9/2002 – 8/2004. Total: \$35,000. Personal share: \$35,000 (100%).
25. *U.S. Bureau of the Census, Dept. of Commerce*, “DynaMaps for Counties USA”, C. North, 7/2002 – 5/2004. Total: \$45,831. Personal share: \$45,831 (100%).
26. *USENIX Association*, “Automated Data Structure Visualization”, C. North, 1/2002 – 6/2003. Total: \$10,160. Personal share: \$10,160 (100%).

Software Grants: (not included in funding totals)

- *Spotfire, Inc.*, software grant for two licenses of “Spotfire DecisionSite, Lead Discovery, and Functional Genomics”, C. North, 9/2004 - 9/2007. Total: \$8970.
- *SAS Institute*, software grant for “SAS JMP”, C. North, 8/2003. Total: \$500.

Internally Funded Grants: (not included in funding totals)

- ICAT, “Be the Data”, L. House, C. North, S. Leman. 8/2014 – 8/2015. Total: \$30,000.
- ICTAS, “Visual Analytics”, Y. Cao, C. North. 9/2012 – 5/2013. Total: \$40,000.

- CHCI, “Visual Programming for Audio Mixing”, C. North, B. Knapp, I. Bukvic. 1/2013-5/2013. Total: \$10,000.
- CHCI, “Ecology of Displays”, F. Quek, C. North. 1/2010-5/2010. Total: \$10,000.

Edited Special Issues, Proceedings, Books:

- J. Dykes, H. Hauser, J. Heer, D. Laidlaw, C. North, G. Santucci, H.W. Shen, A. Ynnerman (editors), “Proceedings of VIS 2013”, *IEEE Transactions on Visualization and Computer Graphics*, Vol. 19, No. 12, Dec 2013.
- S. Carpendale, M. Chen, C. Hansen, K.L. Ma, C. North, (editors), “Proceedings of IEEE Visualization 2008 and Information Visualization 2008”, *IEEE Transactions on Visualization and Computer Graphics*, Vol. 14, No. 6, Nov/Dec 2008. (648 pages)
- A. Kerren, J. Stasko, JD. Fekete, C. North (editors), *Information Visualization – Human-Centered Issues in Visual Representation, Interaction, and Evaluation*. Springer-Verlag, August 2008. (176 pages)
- C. Plaisant, C. North (guest editors), “Special Issue in Honor of Ben Shneiderman’s 60th Birthday: Reflections on Human-Computer Interaction”, *Intl. Journal of Human-Computer Interaction*, vol. 23, No. 3, Dec 2007, (191 pages). Guest editors preface pg. 195-204.
- M. Chen, C. Hansen, C. North, A. Pang, J. vanWijk (editors), “Proceedings of IEEE Visualization 2007 and Information Visualization 2007”, *IEEE Transactions on Visualization and Computer Graphics*, Vol. 13, No. 6, Nov/Dec 2007. (661 pages)
- C. North, M. Haley (editors), *Conference Compendium of IEEE Visualization 2006, IEEE Symposium on Information Visualization 2006, IEEE Symposium on Visual Analytics Science and Technology 2006*, October 2006.
- C. North, T.M. Rhyne, K. Duca (guest editors), "Special Issue on Bioinformatics Visualization", *Information Visualization*, 4(3), Sept 2005, (95 pages). Guest editors preface pg. 147-148.

Book Chapters:

- Chris North, "Information Visualization", chapter in *Handbook of Human Factors and Ergonomics, 4th Edition*, G. Salvendy (editor), New York: John Wiley & Sons, pg. 1209-1236, 2012.
- Jean-Daniel Fekete, Jarke van Wijk, John Stasko, Chris North, "The Value of Information Visualization", chapter in *Information Visualization: Human-Centered Issues and Perspectives*, Springer-Verlag, pp. 1-18, 2008.
- Chris North, "Information Visualization", chapter in *Handbook of Human Factors and Ergonomics, 3rd Edition*, G. Salvendy (editor), New York: John Wiley & Sons, pg. 1222-1246, 2005.
- C. North, B. Shneiderman, C. Plaisant, “User Controlled Overviews of an Image Library: A Case Study of the Visible Human”, in *Readings in Information Visualization: Using Vision to Think*, Card, Mackinlay, Shneiderman (editors), pg. 570-578, Morgan Kaufmann, 1999.
- Chris North, Ben Shneiderman, Catherine Plaisant. “Visual Information Seeking in Digital Image Libraries: The Visible Human Explorer”, chapter in *Information in Images*, Glenn Becker (Editor), Thomson Technology Labs, 1997.

Journal Publications: (Total = 33)

1. J. Moore, C.B. Williams, C. North, A. Johri, M. Paretti. "Effectiveness of Adaptive Concept Maps for Promoting Conceptual Understanding: Findings from a Design-Based Case Study of a Learner-Centered Tool", to appear in *ASEE Advances in Engineering Education*, 15 pages, 2014.
2. C. Rohrdantz, F. Mansmann, C. North, D. Keim. "Augmenting Educational Curriculum with the VAST Challenge: Opportunities and Pitfalls", to appear in *Information Visualization*, 13 pages, 2014. doi: 10.1177/1473871613481693
3. H. Chung, C. Andrews, C. North. "A Survey of Software Frameworks for Cluster-Based Large High-Resolution Displays", *IEEE Transactions on Visualization and Computer Graphics*, 20(8):1158-1177, August 2014.
4. H. Chung, C. North, J. Self, S. Chu, F. Quek, "VisPorter: Facilitating Information Sharing for Collaborative Sensemaking on Multiple Displays", *Journal of Personal and Ubiquitous Computing*, 18(5):1169-1186, June 2014.
5. A. Endert, MS. Hossain, N. Ramakrishnan, C. North, P. Fiaux, C. Andrews, "The human is the loop: new directions for visual analytics", *Journal of Intelligent Information Systems*, pg. 1-25, January 2014. 10.1007/s10844-014-0304-9
6. X. Hu, L. Bradel, D. Maiti, L. House, C. North, S. Leman, "Semantics of Directly Manipulating Spatializations", *IEEE Transactions on Visualization and Computer Graphics*, 19(12): 2052 - 2059, December 2013.
7. C. Andrews, C. North, "The Impact of Physical Navigation on Spatial Organization for Sensemaking", *IEEE Transactions on Visualization and Computer Graphics*, 19(12): 2207 - 2216, December 2013.
8. L. Bradel, A. Endert, K. Koch, C. Andrews, C. North, "Large High Resolution Displays for Co-Located Collaborative Sensemaking: Display Usage and Territoriality", *Intl Journal of Human Computer Studies*, 71(11): 1078-1088, Nov. 2013.
9. P. Fiaux, M. Sun, L. Bradel, C. North, N. Ramakrishnan, A. Endert, "Bixplorer: Visual Analytics with Biclusters," *IEEE Computer*, vol.46, no.8, pp.90-94, August 2013.
10. A. Endert, L. Bradel, C. North, "Beyond Control Panels: Direct Manipulation for Visual Analytics", *IEEE Computer Graphics & Applications*, 33(4):6-13, July 2013.
11. H. Chung, C. North, J. Ferris, "Developing Large High-Resolution Display Visualizations of High-Fidelity Terrain Data", *ASME Journal of Computing and Information Science in Engineering*, 13(3), article #034502, pg. 1-7, 2013.
12. S. Leman, L. House, D. Maiti, A. Endert, C. North, "Visual to Parametric Interaction (V2PI)", *PLoS ONE*, 8(3): e50474, pg. 1-12, March 2013. doi:10.1371/journal.pone.0050474
13. A. Endert, P. Fiaux, C. North, "Semantic Interaction for Sensemaking: Inferring Analytical Reasoning for Model Steering," *IEEE Transactions on Visualization and Computer Graphics*, vol. 18, no. 12, pp. 2879-2888, Dec 2012.
14. C. Andrews, A. Endert, B. Yost, C. North, "Information Visualization on Large, High-Resolution Displays: Issues, Challenges, and Opportunities", *Information Visualization*, vol. 10 no. 4, 341-355, October 2011.
15. T. Ni, D. Bowman, C. North, R. McMahan, "Design and evaluation of freehand menu selection interfaces using tilt and pinch gestures". *Intl. Journal of Human-Computer Studies*, 69(9):551-562, August 2011.
16. C. North, P. Saraiya, K. Duca, "A comparison of benchmark task and insight evaluation methods for information visualization", *Information Visualization*, vol. 10, no. 3, 162-181, July 2011.

17. N. Polys, D. Bowman, C. North, "The role of Depth and Gestalt cues in information-rich virtual environments", *Intl. Journal of Human-Computer Studies*, 69(1-2):30-51, January 2011.
18. S. O'Donoghue, A. Gavin, N. Gehlenborg, D. Goodsell, J. Hériché, C. Nielsen, C. North, A. Olson, J. Procter, D. Shattuck, T. Walter, B. Wong, "Visualizing biological data—now and in the future", *Nature Methods*, 7(3s):2-4, March 2010.
19. T. Dwyer, B. Lee, D. Fisher, K.I. Quinn, P. Isenberg, G. Robertson, C. North, "A Comparison of User-Generated and Automatic Graph Layouts", *IEEE Transactions on Visualization and Computer Graphics*, 15(6): 961-968, October 2009.
20. L. Shupp, C. Andrews, M. Dickey-Kurdziolek, B. Yost, C. North, "Shaping the Display of the Future: The Effects of Display Size and Curvature on User Performance and Insights", *Human-Computer Interaction*, 24(1&2): 230 – 272, January 2009.
21. E. Fox, C. Andrews, W. Fan, J. Jiao, A. Kassahun, S.C. Lu, Y. Ma, C. North, N. Ramakrishnan, A. Scarpa, B. Friedman, S. Sheetz, D. Shoemaker, V. Srinivasan, S. Yang, and L. Boutwelle. "A Digital Library for Recovery, Research, and Learning from April 16, 2007 at Virginia Tech". *Traumatology*, 14(1): 64-84, April 2008.
22. J. Shu, L. T. Watson, N. Ramakrishnan, F. A. Kamke, and C. North, "Unification of problem solving environment implementation layers with XML-based specifications", *Advances in Engineering Software*, vol. 39, no. 3, pg. 189-201, March 2008.
23. A. Kerren, J. Stasko, JD. Fekete, C. North, "Dagstuhl Workshop Report: Information Visualization – Human-Centered Issues in Visual Representation, Interaction, and Evaluation", *Information Visualization*, vol. 6, no. 3, pg. 189–196, Dec 2007.
24. R. Ball, C. North, "Realizing embodied interaction for visual analytics through large displays", *Computers & Graphics*, 31(3): 380-400, June 2007.
25. A. Sabri, R. Ball, S. Bhatia, A. Fabian, and C. North. "High-Resolution Gaming: Interfaces, Notifications and the User Experience", *Interacting with Computers*, 19(2): 151-166, March 2007.
26. P. Saraiya, C. North, V. Lam, K. Duca, "An Insight-based Longitudinal Study of Visual Analytics", *IEEE Transactions on Visualization and Computer Graphics*, 12(6): 1511-1522, November 2006.
27. B. Yost, C. North, "The Perceptual Scalability of Visualization", *IEEE Transactions on Visualization and Computer Graphics*, 12(5): 837-844, Sept. 2006.
28. C. North, "Toward Measuring Visualization Insight", *IEEE Computer Graphics & Applications*, 26(3): 6-9, May/June 2006.
29. P. Saraiya, C. North, K. Duca, "Visualization of Biological Pathways: Requirements Analysis, Systems Evaluation, and Research Agenda", *Information Visualization*, 4(3): 191-205, July 2005.
30. P. Saraiya, C. North, K. Duca, "An Insight-based Methodology for Evaluating Bioinformatics Visualizations", *IEEE Transactions on Visualization and Computer Graphics*, 11(4): 443-456, July 2005.
31. A.D. Songer, B. Hays, C. North, "Multidimensional Visualization of Project Control Data", *Construction Innovation*, 4(3): 173-190, September 2004.
32. C. North, N. Conklin, K. Idukuri, V. Saini. "Visualization Schemas and a Web-based Architecture for Custom Multiple-View Visualization of Multiple-Table Databases", *Information Visualization*, 1(3-4): 211-228, December 2002.
33. C. North, B. Shneiderman. "Snap-Together Visualization: Can Users Construct and Operate Coordinated Views?", *Intl. Journal of Human-Computer Studies*, 53(5): 715-739, November 2000.

Conference Publications: (Total = 56)

1. J. Wang, J. Zhao, S. Guo, C. North, N. Ramakrishnan, “ReCloud: Semantics-Based Word Cloud Visualization of User Reviews”, Proceedings of *Graphics Interface*, pg. 151-158, May 2014. [37.5% acceptance rate]
2. H. Chung, S. Chu, F. Quek, C. North, “A Comparison of Two Display Ecology Models for Collaborative Sensemaking”, *ACM International Symposium on Pervasive Displays (PerDis)*, pg. 37-42, June 2013.
3. J. Moore, C. Williams, C. North, M. Pascale, “Translating Educational Theory Into Educational Software: A Case Study of the Adaptive Map Project”, *120th ASEE Annual Conference*, 14 pages, June 2013.
4. C. Andrews, C. North, “Analyst's Workspace: An embodied sensemaking environment for large, high-resolution displays”, *IEEE Conference on Visual Analytics Science and Technology (VAST)*, pg. 123-131, Oct. 2012. [29% acceptance rate]
5. A. Endert, P. Fiaux, C. North, “Semantic Interaction for Visual Text Analytics”, *ACM Conference on Human Factors in Computing Systems (CHI)*, pg. 473–482, May 2012. [23% acceptance rate]
6. A. Endert, S. Fox, D. Maiti, S. Leman, C. North, “The Semantics of Clustering: Analysis of User-Generated Spatializations of Text Documents”, *International Working Conference on Advanced Visual Interfaces (AVI)*, pg. 555–562, May 2012. [28% acceptance rate]
7. A. Endert, L. Bradel, J. Zeitz, C. Andrews, C. North, “Designing Large High-Resolution Display Workspaces”, *International Working Conference on Advanced Visual Interfaces (AVI)*, pg. 58–65, May 2012. [28% acceptance rate]
8. A. Endert, C. Han, D. Maiti, L. House, S. Leman, C. North, “Observation-level interaction with statistical models for visual analytics”. *IEEE Conference on Visual Analytics Science and Technology (VAST)*, pg. 121-130, October 2011. [32% acceptance rate]
9. K. Vogt, L. Bradel, C. Andrews, C. North, A. Endert, D. Hutchings, “Co-located Collaborative Sensemaking on a Large High-Resolution Display with Multiple Input Devices”, *13th IFIP TC13 Conference on Human-Computer Interaction (INTERACT)*, Vol. 6947, pg. 589 – 604, September 2011. [28% acceptance rate]
10. M.S. Hossain, C. Andrews, N. Ramakrishnan, C. North. “Helping Intelligence Analysts Make Connections”, *Proceedings of the AAAI'11, Workshop on Scalable Integration of Analytics and Visualization*, pg. 22-31, Aug 2011. [25% acceptance rate]
11. A. Singh, L. Bradel, A. Endert, R. Kincaid, C. Andrews, C. North, “Supporting the cyber analytic process using visual history on large displays”. *ACM Proceedings of the 8th International Symposium on Visualization for Cyber Security (VizSec '11)*, 8 pages, July 2011. [55% acceptance rate]
12. A. Endert, C. Andrews, C. North, “Visual encodings that support physical navigation on large displays”. *Proceedings of Graphics Interface (GI)*, pg.103-110, May 2011. [32% acceptance rate]
13. A. Endert, P. Fiaux, H. Chung, M. Stewart, C. Andrews, C. North, “ChairMouse: leveraging natural chair rotation for cursor navigation on large, high-resolution displays”. *Proc. ACM CHI'11 Extended Abstracts on Human Factors in Computing Systems*, pg. 571-580, May 2011. [42% acceptance rate]

14. H. Chung, S. Yang, N. Massjouni, C. Andrews, R. Kanna, C. North, "VizCept: Supporting Synchronous Collaboration for Constructing Visualizations in Intelligence Analysis", *IEEE Conference on Visual Analytics Science and Technology (VAST)*, pg. 107-114, Oct 2010. [28% acceptance rate]
15. S. Yang, H. Chung, C. North, E.A. Fox, "The Effect of Presenting Long Documents on a Large High-Resolution Display on Comprehension of Content and User Experience". *ETD 2010: The 13th International Symposium on Electronic Theses and Dissertations*, 8 pages, June 2010.
16. C. Andrews, A. Endert, C. North, "Space to Think: Large, High-Resolution Displays for Sensemaking", *ACM Conference on Human Factors in Computing Systems (CHI)*, pg. 55-64, April 2010. [22% acceptance rate] [Best Paper Honorable Mention award]
17. P. Saraiya*, C. North, K. Duca, "Comparing Benchmark Task and Insight Evaluation Methods on Timeseries Graph Visualizations", *BELIV 2010 Workshop (BEyond time and errors: novel evaluation methods for Information Visualization) at ACM CHI 2010*, pg. 55-62, 2010.
18. M. Whiting, C. North, A. Endert, J. Scholtz, J. Haack, C. Varley, J. Thomas, "VAST Contest Dataset Use in Education", *IEEE Symposium on Visual Analytics Science and Technology (VAST)*, pg. 115-122, October 2009. [38% acceptance rate]
19. G. Fink, C. North, A. Endert, S. Rose, "Visualizing Cyber Security: Usable Workspaces", *Proc. of Intl Workshop on Visualizing Cyber Security (VizSec)*, pgs 45-56, October 2009. [40% acceptance rate]
20. C. North, T. Dwyer, P. Isenberg, D. Fisher, B. Lee, G. Robertson, K. Inkpen Quinn, "Understanding Multi-touch Manipulation for Surface Computing", *12th IFIP TC13 Conference on Human-Computer Interaction (INTERACT)*, LNCS vol. 5727/2009, pg. 236-249, Sept 2009. [25% acceptance rate]
21. D. Machaj, C. Andrews, C. North, "Co-located Many-player Gaming on Large High-resolution Displays", *International Symposium on Social Computing Applications, IEEE International Conference on Social Computing*, pp. 697-704, August 2009. [20% acceptance rate]
22. S. Peck, C. North, D. Bowman, "A Multiscale Interaction Technique for Large, High-Resolution Displays", *IEEE Symposium on 3D User interfaces (3DUI)*, pg. 31-38, March 2009. [30% acceptance rate]
23. R. Ball, C. North, "The Effects of Peripheral Vision and Physical Navigation in Large Scale Visualization", *Proceedings of Graphics Interface (GI)*, pg. 9-16, June 2008. [38% acceptance rate]
24. R. Ball, C. North, D. Bowman, "Move to Improve: Promoting Physical Navigation to Increase user Performance with Large Displays", *ACM Conference on Human Factors in Computing Systems (CHI)*, pp. 191-200, April 2007. [22% acceptance rate] [Best Paper Honorable Mention award]
25. B. Yost, H. Haciahmetoglu, C. North, "Beyond Visual Acuity: The Perceptual Scalability of Information Visualizations for Large Displays", *ACM Conference on Human Factors in Computing Systems (CHI)*, pp. 101-110, April 2007. [22% acceptance rate]
26. G.A. Fink, V. Duggirala, R. Correa, C. North. "Bridging the Host-Network Divide: Survey, Taxonomy, and Solution", *USENIX Large Installation System Administration Conference (LISA)*, pp. 247-262, Dec 2006.

27. R. Ball, M. DellaNoce, T. Ni, F. Quek, C. North, "Applying Embodied Interaction and Usability Engineering to Visualization on Large Displays", *ACM British HCI - Workshop on Visualization & Interaction*, pp. 57-65, September 2006.
28. B. Berry, L. Hobby, D.S. McCrickard, C. North, M. Perez-Quinones, "Making a Case for HCI: Exploring Benefits of Visualization for Case Studies." *World Conference on Educational Multimedia/Hypermedia and Educational Telecommunications (ED-MEDIA)*, pg. 485-492, June 2006.
29. L. Shupp, R. Ball, B. Yost, J. Booker, C. North, "Evaluation of Viewport Size and Curvature of Large, High-Resolution Display", *Proceedings of Graphics Interface (GI)*, pg. 123-130, June 2006. [33% acceptance rate]
30. P.S. Pyla, J.R. Howarth, C. Catanzaro, C. North, "Vizability: A Tool for Usability Engineering Process Improvement through the Visualization of Usability Problem Data", *ACM Southeast Regional Conference*, pg. 620-625, March, 2006. [41% acceptance rate]
31. R. Ball, M. Varghese, B. Carstensen, E.D. Cox, C. Fierer, M. Peterson, C. North, "Evaluating the Benefits of Tiled Displays for Navigating Maps", *IASTED International Conference on Human-Computer Interaction*, pg. 66-71, Nov 2005.
32. G. Fink, P. Muessig, C. North, "Visual Correlation of Host Processes and Network Traffic", *Workshop on Visualization for Computer Security (VizSec), IEEE Visualization Conference*, pg. 11-19, 2005. [40% acceptance rate]
33. G. Fink, C. North, "Root Polar Layout of Internet Address Data for Security Administration", *Workshop on Visualization for Computer Security (VizSec), IEEE Visualization Conference*, pg. 55-64, 2005. [40% acceptance rate]
34. P. Saraiya, P. Lee, C. North, "Visualization of Graphs with Associated Timeseries Data", *IEEE Symposium on Information Visualization (InfoVis)*, pg. 225- 232, 2005. [27% acceptance rate]
35. R. Ball, C. North, "An Analysis of User Behavior on High-Resolution Tiled Displays", *Tenth IFIP TC13 International Conference on Human-Computer Interaction (INTERACT)*, LNCS volume 3585/2005, pg. 350-364, 2005. [27% acceptance rate]
36. S. Krishnamoorthy, C. North, "Learnability of Interactive Coordinated-View Visualizations", *International Conference on Information Visualisation (IV)*, pg. 306-311, 2005.
37. R. Ball, G.A. Fink, C. North, "Home-Centric Visualization of Network Traffic for Security Administration", *CCS Workshop on Visualization and Data Mining for Computer Security*, pg. 55-64, 2004.
38. P. Saraiya, C. North, K. Duca, "An Evaluation of Microarray Visualization Tools for Biological Insight", *IEEE Symposium on Information Visualization (InfoVis)*, pg. 1-8, 2004. [30% acceptance rate]
39. N. Kampanya, R. Shen, S. Kim, C. North, E.A. Fox, "Citiviz: A Visual User Interface to the CITIDEL System", *8th European Conference on Digital Libraries (ECDL)*, LNCS vol. 3232/2004, pg. 122-133, 2004. [32% acceptance rate]
40. D. Raja, D. Bowman, J. Lucas, C. North, "Exploring the Benefits of Immersion in Abstract Information Visualization", *8th International Immersive Projection Technology Workshop*, 8 pages, 2004.
41. N. Polys, D. Bowman, C. North, R. Laubenbacher, K. Duca, "PathSim Visualizer: an Information-Rich Virtual Environment Framework for Systems Biology", *Proceedings of ACM Web3D Symposium*, pg. 7-14, 2004. [53% acceptance rate]

42. P. Saraiya, C.A. Shaffer, D.S. McCrickard, C. North, "Effective Features of Algorithm Visualizations", *ACM Technical Symposium on Computer Science Education (SIGCSE)*, pg. 382 - 386, 2004. [28% acceptance rate]
43. N. Polys, M. Moldenhauer, A. Ray, C. Dandekar, C. North, D. Bowman, "Snap2Diverse: Coordinating Information Visualizations and Virtual Environments", *Proceedings of SPIE Conference on Visualization and Data Analysis (VDA)*, pg. 189-200, 2004.
44. Y.S. Ryu, B. Yost, G. Convertino, J. Chen, C. North, "Exploring Cognitive Strategies for Integrating Multiple-View Visualizations", *Human Factors and Ergonomics Society 47th Annual Meeting (HFES)*, pg. 591-595, 2003. [Award for Best Student-Authored Paper]
45. Q. Li, C. North, "Empirical Comparison of Dynamic Query Sliders and Brushing Histograms", *IEEE Symposium on Information Visualization (InfoVis)*, pg. 147-154, 2003. [32% acceptance rate]
46. D. Bowman, C. North, J. Chen, N. Polys, P. Pyla, U. Yilmaz, "Towards Usable and Effective Information-Rich Virtual Environments", *ACM Virtual Reality Software and Technology (VRST)*, pg. 81-90, 2003. [35% acceptance rate]
47. G. Convertino, J. Chen, B. Yost, Y.S. Ryu, C. North, "Exploring Context Switching and Cognition in Dual-View Coordinated Visualizations", *Intl. Conf. on Coordinated & Multiple Views in Exploratory Visualization (CMV)*, pg. 55-62, 2003.
48. C. North, N. Conklin, V. Saini, "Visualization Schemas for Flexible Information Visualization", *IEEE Symposium on Information Visualization (InfoVis)*, pg. 15-22, 2002. [27% acceptance rate]
49. S. Jayaraman, C. North, "A Radial Focus+Context Visualization for Multi-Dimensional Functions", *IEEE Visualization Conference (Vis)*, pg. 443-450, 2002. [33% acceptance rate]
50. C. M. Chewar, D.S. McCrickard, A. Ndiwalana, C. North, J. Pryor, D. Tesselndorf, "Secondary Task Display Attributes: Optimizing Visualizations for Cognitive Task Suitability and Interference Avoidance", *Eurographics IEEE TCVG Symposium on Visualization (VisSym)*, pg. 165-171, 2002. [39% acceptance rate]
51. J. Somervell, D.S. McCrickard, C. North, M. Shukla, "An Evaluation of Information Visualization in Attention-Limited Environments", *Eurographics IEEE TCVG Symposium on Visualization (VisSym)*, pg. 211-216, 2002. [39% acceptance rate]
52. G. Dang, C. North, B. Shneiderman, "Dynamic Queries and Brushing on Choropleth Maps", *International Conference on Information Visualisation (IV)*, pg. 757-764, 2001.
53. C. North, "Multiple Views and Tight Coupling in Visualization: A Language, Taxonomy, and System", *Workshop of Fundamental Issues in Visualization (FIV), CSREA International Conference on Imaging Science, Systems, and Technology (CISST)*, pg. 626-632, 2001.
54. C. North, B. Shneiderman. "Snap-Together Visualization: A User Interface for Coordinating Visualizations via Relational Schemata", *ACM International Working Conference on Advanced Visual Interfaces (AVI)*, pg. 128-135, 2000.
55. A. Fredrikson, C. North, C. Plaisant, B. Shneiderman, "Temporal, Geographical and Categorical Aggregations Viewed through Coordinated Displays: a Case Study with Highway Incident Data", *Workshop on New Paradigms in Information Visualization and Manipulation (NPIVM), ACM International Conference on Information and Knowledge Management (CIKM)*, pg. 26-34, 1999.
56. C. North, B. Shneiderman, C. Plaisant. "User Controlled Overviews of an Image Library: A Case Study of the Visible Human", *ACM Digital Libraries Conference (DL)*, pg. 74-82, 1996.

Conference Short Papers, Videos, Posters:

- M. Sun, L. Bradel, C. North, and N. Ramakrishnan, “The Role of Interactive Biclusters in Sensemaking”, *ACM Conference on Human Factors in Computing Systems (CHI)*, pg. 1559–1562, April 2014. [22.8% acceptance rate]
- L. Bradel, J. Self, A. Endert, M.S. Hossain, C. North, N. Ramakrishnan, “How Analysts Cognitively ‘Connect the Dots’”, *IEEE International Conference on Intelligence and Security Informatics (ISI)*, pg. 24–26, June 2013. (Short talk)
- J. Self, R. Zeitz, C. North, A. Breitler, “Auto-Highlighter: Identifying Salient Sentences in Text”, *IEEE International Conference on Intelligence and Security Informatics (ISI)*, pg. 260-262, June 2013. (Short talk)
- J. Wang, K. Dent, C. North, “Fisheye Word Cloud for Temporal Sentiment Exploration”, *ACM CHI Extended Abstracts on Human Factors in Computing Systems*, pg. 1767-1772, April 2013. (Poster) [32% acceptance rate]
- A. Endert, C. North. “Interaction Junk: User Interaction based evaluation of visual analytics”, *BELIV Workshop at IEEE VisWeek*, 3 pages, 2012. (Short talk)
- Y. Cao, R. Moore, P. Mi, A. Endert, C. North, R. Marchany. “Dynamic analysis of large datasets with animated and correlated views”, *VAST Challenge 2012, IEEE Visual Analytics Science and Technology (VAST)*, pg. 283-284, 2012. (Contest Entry) [Honorable Mention award]
- H. Chung, Y. J. Cho, J. Self, C. North, “Pixel-oriented Treemap for multiple displays”, *VAST Challenge 2012, IEEE Visual Analytics Science and Technology (VAST)*, pg. 289-290, 2012. (Contest Entry)
- A. Endert, P. Fiaux, C. North, “Unifying the Sensemaking Loop with Semantic Interaction”, *Workshop on Interactive Visual Text Analytics for Decision Making, at IEEE VisWeek*, 4 pages, October 2011. (Short talk)
- C. Andrews, M.S. Hossain, S. Gad, N. Ramakrishnan, C. North. “Analyst's workspace: Protecting vastopolis”, *VAST Challenge 2011, IEEE Conference on Visual Analytics Science and Technology (VAST)*, pg. 323-324, Oct 2011. (Contest Entry) [VAST Challenge Award]
- T. Ni, D. Bowman, C. North. “AirStroke: bringing unistroke text entry to freehand gesture interfaces”, *ACM Conference on Human Factors in Computing Systems (CHI)*, pg. 2473-2476, May 2011. (Short talk) [27% acceptance rate]
- C. Andrews, A. Endert, C. North, "Analyst Workspace", *VAST Challenge 2010 Workshop, IEEE VisWeek 2010*, Oct 2010. (Contest Entry)
- A. Endert, C. Andrews, G.A. Fink, C. North, "Professional Analysts using a Large, High-Resolution Display", *VAST Challenge 2009, IEEE Conference on Visual Analytics Science and Technology (VAST)*, pg. 273-274, 2009. (Contest Entry) [Awarded Special Contributions to the VAST Challenge Contest]
- J. Booker, T. Buennemeyer, A. Sabri, C. North, “High-resolution displays enhancing geotemporal data visualizations”, *ACM Southeast Regional Conference*, pg. 443-448, 2007. (Short talk) [59% acceptance rate]
- J. Booker, T. Buennemeyer, A. Sabri, C. North, "High-Resolution Displays Enhancing Geotemporal Data Visualizations", *IEEE Intelligence and Security Informatics (ISI)*, 2 pages, July 2006. (Poster)
- R. Ball, A. Sabri, M. Varghese, C. North, "Tracking User Navigation and Performance on High-Resolution Displays using a Dynamic Real-Time Strategy Game", *Compendium Proc. of IEEE Symposium on Information Visualization (InfoVis)*, pg. 5-6, October 2005. (Poster)

- R. Ball, C. North, "Effects of Tiled High-Resolution Display on Basic Visualization and Navigation Tasks", *ACM Extended Abstracts on Human Factors in Computing Systems (CHI)*, pg. 1196-1199, 2005. (Short talk) [25% acceptance rate]
- B. Yost, C. North, "Single Complex Glyphs Versus Multiple Simple Glyphs", *ACM Extended Abstracts on Human Factors in Computing Systems (CHI)*, pg. 1889-1892, 2005. (Poster) [36% acceptance rate]
- C. North, "High-Resolution Displays for Visualization", *NSF/NIH Workshop on Visualization Research Challenges*, NIH, 2004. (Position statement)
- C. North, "Snap-Together Visualization", *Workshop on Visualization Software Infrastructures, at IEEE Symposium on Information Visualization (InfoVis)*, 2004. (Position statement)
- P. Saraiya, K. Duca, C. North, "A Biochemical Pathway Tool for Visualization and Discovery Using Functional Genomics and Proteomics Data", *Biomedical Information Science and Technology Initiative (BISTI) Symposium, Digital Biology: The Emerging Paradigm*, NIH, 2003. (Poster)
- N. Polys, D. Bowman, K. Duca, R. Laubenbacher, C. North, "Interactive Visualization of Biological Databases Using Information-Rich Virtual Environments", *Biomedical Information Science and Technology Initiative (BISTI) Symposium, Digital Biology: The Emerging Paradigm*, NIH, 2003. (Poster)
- J. Carroll, D. Bowman, S. McCrickard, C. North, M. Pérez-Quiñones, M. Rosson, "Center for Human-Computer Interaction at Virginia Tech", *Proceedings of IFIP TC13 International Conference on Human-Computer Interaction (INTERACT)*, pp. 1061-1062, 2003. (Short talk)
- Q. Li, C. North, "Dynamic Query Sliders vs. Brushing Histograms", *Extended Abstracts of the ACM Conference on Human Factors in Computing Systems (CHI)*, pg. 834-835, 2003. (Short talk) [38% acceptance rate]
- C. North, N. Conklin, K. Idukuri, V. Saini, Q. Yu, "Fusion: Interactive Coordination of Diverse Data, Visualizations, and Mining Algorithms", *ACM CHI Extended Abstracts on Human Factors in Computing Systems (CHI)*, pg. 626-627, April 2003. (Short talk)
- N. Conklin, S. Prabhakar, C. North, "Multiple Foci Drill-Down through Tuple and Attribute Aggregation Polyarchies in Tabular Data", *IEEE Symposium on Information Visualization (InfoVis)*, pg. 131-134, 2002. (Short talk) [27% acceptance rate]
- C. North, "Dynamically Integrating Diverse Data and Tools for Flexible Bioinformatics Visualization: Putting the Biologist in Control of the Loop, Letting the Computer Scientist Out of the Loop", *Workshop on Visualization in Bioinformatics and Cheminformatics, IEEE Visualization Conference*, October 2002. (Short talk)
- J. Wang, A. Agrawal, A. Bazaz, S. Angle, E. Fox, C. North, "Enhancing the Envision Interface for Digital Libraries", *Proc. ACM/IEEE Joint Conference on Digital Libraries (JCDL)*, pg. 275-276, 2002. (Short talk)
- V. Colaso, A. Kamal, P. Saraiya, C. North, D.S. McCrickard, C.A. Shaffer, "Learning and Retention in Data Structures: A Comparison of Visualization, Text, and Combined Methods", *AACE World Conference on Educational Multimedia, Hypermedia & Telecommunications (ED-MEDIA)*, 2 pages, 2002. (Short talk)
- S. Prabhakar, N. Conklin, C. North, "Breakdown Visualization: Multiple Foci Polyarchies of Values and Attributes", *Extended Abstracts of the ACM Conference on Human Factors in Computing Systems (CHI)*, pg. 800-801, 2002. (Short talk) [16% acceptance rate]

- D. Tessenorf, C. Chewar, A. Ndiwalana, J. Pryor, D.S. McCrickard, C. North. “An Ordering of Secondary Task Display Attributes”, *Extended Abstracts of the ACM Conference on Human Factors in Computing Systems (CHI)*, pg. 600-601, 2002. (Short talk) [16% acceptance rate]
- C. North, U. Farooq, D. Akhter, “DataWear: Revealing Trends of Dynamic Data in Visualizations”, *IEEE Symposium on Information Visualization (InfoVis), Late Breaking Hot Topics*, pg. 8-11, 2001. (Short talk)
- M. Beale, D.S. McCrickard, C. North, M. Einstein, P. Saraiya, “Visualizing Communication Timelines Containing Sparsely Distributed Clusters”, *IEEE Symposium on Information Visualization (InfoVis), Late Breaking Hot Topics*, pg. 16-19, 2001. (Short talk)
- Y. Tian, M. Clement, M. Ellis, J. Steele, C. North, "Gene Expression Mural: Visualizing Gene Expression Databases", *Work-in-Progress Compendium Proceedings of the IEEE Visualization Conference*, 2 pages, 2001. (Short talk)
- C. North, B. Shneiderman, “Component-Based, User-Constructed, Multiple-View Visualization”, *Extended Abstracts and Video Proc. of the ACM Conference on Human Factors in Computing Systems (CHI)*, pg. 201-202, 2001. (Poster)
- C. North. “Robust, End-User Programmable, Multiple-Window Coordination”, *Extended Abstracts of the ACM Conference on Human Factors in Computing Systems (CHI)*, pg. 60-61, 1998. (Poster)
- C. North, F. Korn, “Browsing Anatomical Image Databases: A Case Study of the Visible Human”, *Extended Abstracts and Video Proc. of the ACM Conference on Human Factors in Computing Systems (CHI)*, pg. 414-415, 1996. (Video)
- C. North, B. Shneiderman, C. Plaisant, “User Controlled Overviews of an Image Library: The Visible Human Explorer”, *Proc. of the National Library of Medicine Visible Human Project Conference*, NIH, 2 pages, 1996. (Demonstration)
- C. North, B. Shneiderman, “User Interfaces for the Visible Human Project”, *IEEE Forum on Advances in Digital Libraries (ADL)*, 2 pages, 1996. (Demonstration)

Abstracts of Organized Panels, Workshops, Tutorials:

- C. Rooney, A. Endert, JD. Fekete, K. Hornbaek, C. North. “Powerwall: Workshop on Interactive, Ultra-high Resolution Displays”, *ACM CHI '13 Extended Abstracts on Human Factors in Computing Systems*, pg. 3227-3230, April 2013. (Workshop abstract)
- J. Gabbard, E. Swan, C. North, “Tutorial: Quantitative and Qualitative Methods for Human-Subject Visualization Experiments”, *Proc. of VisWeek 2011*, Providence RI, October 2011. (Tutorial abstract)
- C. North, R. Chang, A. Endert, W. Dou, R. May, B. Pike, G. Fink, “Analytic Provenance: Process + Interaction + Insight”, *ACM CHI '11 Extended Abstracts on Human Factors in Computing Systems*, p. 33–36, May 2011. (Workshop abstract)
- C. North, S. O’Donoghue, M. Hibbs, I. Dubchak, N. Gehlenborg, C. Nielsen, M. Meyer, C. Gorg, "Panel: Challenges in Visualizing Biological Data", *Proc. of IEEE VisWeek 2010*, Oct 2010. (Panel abstract)
- T.J. Jankun-Kelly, R. Kosara, G. Kindlmann, C. North, C. Ware, E.W. Bethel, "Panel: Is There Science in Visualization?", *Compendium Proceedings of IEEE Visualization 2006*, pg. 68-71, Oct 2006. “Visualization Science Requires Methods for Measurement” (Panel abstract) [Best Panel Award]

- C. North, G. Robertson, R. Ball, B. Yost, “Workshop: Using Large, High-Resolution Displays for Information Visualization”, *Proc. of IEEE Visualization*, Oct. 2005. (Workshop abstract)
- T.M. Rhyne, T. Dunning, G. Calapristi, C. North, D. Gresh, “Panel: Evolving Visual Metaphors and Dynamic Tools for Bioinformatics Visualization”, *Proc. IEEE Visualization 2002*, pg. 579-582, October 2002. “Flexible Bioinformatics Visualization and Fusion” (Panel abstract)

Other Papers:

- Fink G.A., Scholtz, J.C., Frincke, D. A., D McColgin, ML Gregory, D Gracanin, C North, K Edwards, J Karat, C Karat, and C Brodie. 2006. “Secure Systems Must be Usable. Usability: The Missing Section 8.3 in the Federal Cyber Security Plan”. PNNL-SA-53000 Pacific Northwest National Laboratory, Richland, WA.
- Polys, N., Bowman, D., North, C., “Information-Rich Virtual Environments: Challenges and Outlook”, *NASA Workshop on the Knowledge Integrating Virtual Iron Bird*, 8 pages, (Monterey, April 2004).
- C. North, E. Kandogan, B. Shneiderman. Information Abundant Interfaces: Advanced Organization and Coordination. *Proceedings NSF Interactive Systems Grantees Workshop '97*, pg. 269-271, (1997).
- C. North. Computer Composer. *Enter: The World of Computers and New Technology*, vol. 2, no. 7, pg. 24, Children's Television Workshop, (May 1985).

Keynote Presentations:

- Chris North, “Display Space: The Final Frontier in Visual Analytics”, *Graphics Interface (GI)*, May 2012, Toronto, Canada.
- Chris North, “Usability and Evaluation in Bioinformatics Visualization”, *EMBO Workshop on Visualizing Biological Data (VizBi)*, March 2010, Heidelberg, Germany.
- Chris North, “GigaPixel Displays: New Opportunities for Interactive Visual Analytics”, *International Workshop on Giga-Pixel Displays & Visual Analytics (GIANT)*, April 2008, Leeds, UK.

Other Invited Presentations and Lectures:

- L. Bradel, C. North, “StarSpire: Multi-Scale Semantic Interaction for Visual Text Analytics”, DHS VACCINE annual meeting, Sept 2013. (Demonstration)
- C. North, “Semantic Interaction for Visual Reasoning”, Dagstuhl Seminar on Interaction in Visual Reasoning, Dagstuhl, Germany, Aug 2013.
- C. North, “Display Space: The Final Frontier in Interactive Visual Analytics”, DOD, Aug 2013.
- C. North, “Semantic Interaction in Visual Analytics: Towards the Goal of Cognition + Computation”, Sandia National Labs, April 2013 and May 2013; Los Alamos National Labs, May 2013.
- C. North, L. Bradel. “Large Displays for Cyber Analytics”, Hume Center Open House, Sept. 2012.
- C. North, “New Opportunities in Visual Analytics”, Dahlgren, Aug 2012.
- C. North, L. Bradel. “ForceSpire: Semantic Interaction for Visual Text Analytics”, VACCINE annual meeting, May 2012. (Demonstration)

- C. North. “GigaPixel Displays: New Opportunities for Interactive Visual Analytics”, Dept Seminar, University of Copenhagen, April 2012.
- C. North, A. Endert, A. Esakia, “Large Displays for Cyber Analytics”, S2ERC annual meeting, 2011, 2012, 2013.
- S. Leman, L. House, C. North, “Bayesian Analysis in Visual Analytics”, Virginia Tech Discovery to Decision D2D Workshop, November 2011.
- C. North, A. Endert, “Visual Analytics for Cyber Security”, Sandia National Laboratories, University Partners Cyber Open House and Workshop, Albuquerque NM, July 2011.
- C. North “Visual Analytics”, Advisory Board Meeting of the Hume Center, March 2011.
- H. Chung, C. North, J. Ferris, “GigaPixel Displays for Terrain Visualization”, *RPUG Conference 2010*. (Invited presentation and demonstrations)
- C. North, S. Leeman, L. House, “User-guided spatialization of text document collections”, presented at the *NSF Visualizing Award Portfolios Advisory Committee* meeting, Sept 2010.
- C. North, "Challenge Datasets in Visual Analytics Education", *Visual Analytics Education Workshop*, Visual Analytics Consortium meeting, Aug 2010.
- C. North, “GigaPixel Display”, C-Tech² summer program for high-school girls, presented annually 2010-present. [Diversity initiative]
- S. Leman, L. House, C. North, “Bayesian Analysis in Visual Analytics”, *NSF FODAVA Workshop*, Dec 2009, 2010, 2011, 2012.
- N. Ramakrishnan, C. North, F. Quek, “Storytelling in Visual Analytics”, *NSF FODAVA Workshop*, Dec 2009, 2010, 2011, 2012.
- C. North, “Visual Analytics on Large High-Resolution Displays”, Seminar Series of the Department of Computer Science, Virginia Tech, October 2009.
- C. North, “Big Displays: What’s the Big Deal?”, Pacific Northwest National Laboratories, Richland, WA, December 2007, February 2009.
- N. Polys, C. North, “Writing Grants with Visualization Components”, FDI short course, Virginia Tech, October 2007.
- R. Ball, C. North, “Large Displays for Visual Analytics”, *NSA Analyst Conference*, May 2007, Washington DC. (Exhibit)
- C. North, “Ultra-High Resolution Interactive Information Visualization”, NGA Academic Research Program Symposium, September 2007, Washington DC.
- C. North, “Impacts of Large Displays on Analysts”, NSA Knowledge Computing Workshop, October 2007, Columbia, MD.
- C. North, “Undergraduate research in computer science at VT”, College of Engineering undergraduate recruiting day, April 2, 2007.
- C. North, “GigaPixel Research at VT”, Advisory Board, Dept. of Computer Science, Virginia Tech, Oct 12, 2006.
- R. Ball, B. Yost, S. Peck, C. North, “High-resolution Information Visualization”, *IEEE Visualization 2006*, October 2006. (Exhibit)
- C. North, “Insight-based Evaluation of Bioinformatics Visualizations”, Eli Lilly & Co, June 2005.
- S. McCrickard, C. North, “Usability Engineering and Visualization”, NIST, June 2005.
- C. North, P. Saraiya, K. Duca, “Evaluating Bioinformatics Visualizations for Biological Insight”, Spotfire, Inc., May 2005. (Webcast lecture)

- F. Quek, C. North, “The AwareLab and GigaPixel Display”, *Pacific Northwest National Labs*, May 2005, Richland, WA.
- C. North, L. Carstensen, “Ultra-High Resolution Interactive Information Visualization”, ARDA/DTO PI Meetings: Feb 2005, Tampa, FL; Nov 2005, Orlando, FL; Nov 2006, Orlando, FL; March 2007, Dallas, TX.
- C. North, “GigaPixel Display”, Association for Women in Computing’s “Women in Computing Day”, presented annually 2004-present. [Diversity initiative]
- C. North, “ArcJump”, *ESRI User Conference*, 2003. (Demonstration)
- C. North, “Snap ArcJump”, SAS Institute Inc., 2003.
- C. North, “Adaptive Information Visualization in Multi-Tasking Environments”, Naval Surface Warfare Center, Dahlgren Division, Technical Interchange Day, April 12, 2002.
- C. North, D. Desjardins, “SNAP EDA Mapping Software”, U.S. Census Bureau, April 8, 2002.
- C. North, “Bioinformatics Research in Computer Science at Virginia Tech”, Agilent Laboratories, Mar 8, 2002.
- C. North, “Peripheral Visualization”, Microsoft Research, Mar 6, 2002.
- C. North, “Visualization Schemas and Snap-Together Visualization”, Central Washington University, April 2, 2001; Pacific Northwest National Labs, Mar 5, 2002; Microsoft, SQL Server group, Mar 7, 2002.
- C. North, “Multi-Dimensional Data Visualization”, B.F. Goodrich Corporation, May 2001.
- C. North, “Information Visualization for the Masses”, Seminar Series, Dept. of Computer Science, Virginia Tech, Sept 27, 2000.
- C. North, “Snap-Together Visualization”, Virginia Tech, University of Minnesota, Ohio State University, Microsoft Research, Lucent Bell-Labs, AT&T Research Labs, IBM Almaden, Spring 2000.
- C. North, “Dynamaps: The Marriage of Interactive Mapping and Graphical Data Analysis”, Census Seminar Series, U.S. Bureau of the Census, Washington DC, February 17, 2000 and March 6, 2000; *National Cancer Institute*, National Institute of Health, Bethesda, MD, May 15, 2000.
- C. North, “Dynamic Queries and Snap-Together Visualization”, Census Seminar Series, U.S. Bureau of the Census, Washington DC, July 26, 1999 and October 27, 1999.
- C. North, “Snap-Together Visualization”, Symposium and Open House, Human-Computer Interaction Lab, University of Maryland, June 18, 1999.
- C. North, “Surviving Graduate School”, Gateway Seminar, Information Systems Department, University of Maryland, Baltimore County, April 2, 1999. (Guest Lecture)
- C. North, “Tightly-Coupled Views”, Symposium and Open House, Human-Computer Interaction Lab, University of Maryland, May 30, 1997.
- C. North, “Visible Human Explorer: 2D or not 2D”, Symposium and Open House, Human-Computer Interaction Lab, University of Maryland, June 7, 1996.
- C. North, “Advanced Visual Information Seeking Interfaces”, Multimedia Project Development, Dept. of Computer Science, George Washington University, Washington DC, March 28, 1996 and March 3, 1997. (Guest Lecture)
- C. North, “Visible Human Project: Accessing Images of Human Anatomy”, *Software Psychology Society*, Washington DC, December 8, 1995.

- C. North, “Visible Human Project: Browsing Gigabytes of Medical Imagery”, Symposium and Open House, Human-Computer Interaction Lab, University of Maryland, June 2, 1995.

Students Advised:

Current graduate students:

- Current PhD students (7): Lauren Bradel, Haeyong Chung, Jessica Self, Andre Esakia, Caleb Reach, Maoyuan Sun, Manjula Iyer.
- Current MS students (0).

Post-Docs Supervised:

- Bob Ball, Aug 2006-May 2007.

Ph.D. Dissertations Supervised: (8 Graduated)

- Alex Endert, “Semantic Interaction for Visual Analytics: Inferring Analytical Reasoning for Model Steering”, August 2012. [IEEE VGTC Best Doctoral Dissertation Award, 2013; Outstanding PhD Dissertation Award, Department of Computer Science, VT]
- Christopher Andrews, “Space to Think: Sensemaking and Large, High-Resolution Displays”, August 2011.
- Tao Ni, “A Framework of Freehand Gesture Interaction: Techniques, Guidelines, and Applications”, August 2011, (co-advise with Doug Bowman).
- Beth Yost, “The Visual Scalability of Integrated and Multiple View Visualizations for Large, High Resolution Displays”, May 2007.
- Bob Ball, “Effects of Large, High-Resolution Displays for Geospatial Information Visualization”, August 2006.
- Glenn Fink, “Visual Correlation of Network Traffic and Host Processes for Computer Security”, August 2006. [Awarded NSF IGERT graduate fellowship.]
- Nicholas Polys, “Display Techniques in Information-Rich Virtual Environments”, August 2006, (co-advise with Doug Bowman) [Outstanding PhD Dissertation Award, Department of Computer Science, VT].
- Purvi Saraiya, “Insight-Based Studies for Pathway and Microarray Visualization Tools”, August 2006.

M.S. Theses Supervised: (14 graduated)

- Andre Esakia, “Large display interaction via multiple acceleration curves on a touchpad”, December 2013.
- Kevin Logan, “SpatialHistory: Using Spatial Memory to Recall Information”, December 2012.
- Ji Wang, “Clustered Layout Word Cloud for User Generated Online Reviews”, May 2012.
- Patrick Fiaux, “Solving Intelligence Analysis Problems using Biclusters”, Jan 2012.

- David Machaj, “Co-Located Many-Player Gaming on Large High-Resolution Displays”, May 2009.
- Sarah Peck, “A Multiscale Interaction Technique for Large, High-Resolution Displays”, May 2008.
- Mehmet Celal Dasiyici, “Multi-Scale Cursor : Optimizing Mouse Interaction for Large Personal Workspaces”, May 2008.
- Lauren Shupp, “The Effects of Curving Large, High-Resolution Displays on User Performance”, August 2006. [Outstanding Master’s Thesis Award, Department of Computer Science, May 2007; nominated by Virginia Tech for the Conference of Southern Graduate Schools 2007 Innovative Application of Technology in a Master's Thesis Award]
- Sujatha Krishnamoorthy, “Designing Interactive Visualizations for First-time Novice Users”, December 2005.
- Chris Catanzaro, “Vizability: Visualizing Usability Evaluation Data Based on the User Action Framework”, Spring 2005.
- Kiran Indukuri, “Fusion: A Visualization Framework for Interactive Rule Mining with Applications to Bioinformatics”, Fall 2004.
- John Costigan, “Applying Information Visualization Techniques to Visual Debugging”, Spring 2003.
- Varun Saini, “Visualization Schemas: A User Interface Extending Relational Data Schemas for Flexible, Multiple-View Visualization of Diverse Databases”, Spring 2003.
- Sanjini Jayaraman, “PolarEyez: A Radial Focus+Context Visualization for Multidimensional Functions”, Fall 2002.
- Nathan Conklin, “A web-based, run-time extensible architecture for interactive visualization and exploration of diverse data”, Fall 2002. [Outstanding Graduate Research Award, Department of Computer Science, VT, 2002.]

Graduate independent study students supervised: (11 total)

- Seth Fox, Fall 2011
- Andrew Perez-Lopez, Fall 2004
- Umur Yilmaz, Spring 2004
- Youngyun Chungbaek, Fall 2003
- Qiang Yu, Fall 2003
- Ying Chen, Spring 2003
- Ines Khelifi, Spring 2003
- Xiaofeng Bao, Fall 2002
- Qing Li, Fall 2002
- Yi Zhang, Fall 2002
- Matt Clement, Spring 2002

Undergraduate research students supervised: (68 total)

- 2012-2013: Michel Pascale.
- 2011-2012: Andrew Berlin, Sarah Hendon, James McIntyre, John Nein, Lauren Gibboney, Joe Luke, Michel Pascale, Joshua Rush, Ashleigh Hon (Psychology), Douglas Smith (VT Scieneering program, co-advised by A. Cate, Psychology).

- 2010-2011: Russell Wolf.
- 2007-2008: Yonathan Taye, Nick Ciafardoni.
- 2006-2007: John Frame, Scott Conner, Ron Forbes, David Machaj, Alan Tran.
- 2005-2006: Mike Szvedo, Mike DellaNoche, Matt Witherspoon, Frank Malapelle, Ross Schwalm.
- 2004-2005: Dan Keathley, Tyler Hennessy, Paul Muessig, Peter Lee, Jeff Mitchell, Andrew Sabri, Chris Fierer, Dana Cox, Mike Varghese, Ryan Silva, Roy Baladi, Luis Barberi, Matthew Peters.
- 2003-2004: Ankit Singhal, Andrew Brletich, Michael Bevels, Larry Leventhal, Mike Johnson, Yoon-Soo Lee, Soohyung Lee, Henry Holstein, David Longley, Martin Holmes, Dustin Arendt, Mensur Medic, Nipun Jawalkar, Justin Martin, Erinn Bull.
- 2002-2003: Chris Shirk, Scott Walker, Craig Sinning, Matt Ingram, Patrick Wolf, Paul Murphy, Geoff Zelenka, Joseph Goodman.
- 2001-2002: Ben Whilite, John Costigan, Carlos Fernandez, Ben Bradley, Aaron Shook, Amit Nithian.
- 2000-2001: Sam Stone, Matt Sample, Chris Chin.

Undergraduate honors theses supervised:

- John Costigan, B.S., May 2002.

Visiting research students supervised:

- Alva Lee, visiting graduate study-abroad student, Taiwan, 2010-2011
- Kristen Koch, visiting undergraduate student NSF REU, Tulane Univ., summer 2011
- Kate Vogt, visiting undergraduate student NSF REU, Elon Univ., summer 2010

Ph.D. Dissertation Committee Memberships: (27 total)

- Felip Bacim, PhD
- Yinlin Chen, PhD
- Sukhwan Cho, PhD (Mech. Eng.)
- Samah Gad, PhD
- Xinran Hu, PhD (Statistics)
- Peng Mi, PhD
- Jongsoon Park, PhD (ISE)
- Lucas Roberts, PhD (Statistics)
- Huijun Xiong, PhD
- Hao Zhang, PhD
-
- Patrick Butler, PhD, 2014
- Bireswar Laha, PhD, 2014
- Hussain Almohri, PhD, 2013
- Shubhangi Deshpande, PhD, 2013
- Chreston Miller, PhD, 2013
- Jacob Moore, PhD, Dept. of Engineering Education, 2013
- Chao Peng, PhD, 2013
- Eric Ragan, PhD, 2013

- Huijun Xiong, PhD, 2013
- Chao Han, PhD, Dept. of Statistics, 2012
- Mahmud Shahriar Hossain, PhD, 2012
- Youn Ah Kang, PhD, Interactive Computing, Georgia Tech, 2012
- Dipayan Maiti, PhD, Dept. of Statistics, 2012
- Regis Kopper, PhD 2011
- Ryan McMahan, PhD, 2011
- Hussein Ahmed, PhD, 2010
- Yi Wang, PhD, 2010
- Jiang Shu, PhD, 2009
- Timothy Buennemeyer, PhD, Dept. of ECE, 2008
- Seonho Kim, PhD, 2008
- Andrew Ray, PhD, 2008
- Deept Kumar, PhD, 2007
- Weidong Huang, PhD, Computer Science, University of Sydney, Australia, 2007
- Boon Kee Soh, PhD, Dept. of ISE, 2007
- Jian Chen, PhD, 2006
- Animesh Patcha, PhD, Dept. of ECE, 2006
- Fernando Das Neves, PhD, 2004
- Wendy Schafer, PhD, 2004
- Jacob Somervell, PhD, 2004
- William Staderman, PhD, Dept. of ISE, 2003

M.S. Thesis Committee Memberships: (27 total)

- Sruthi Iyer, MS, 2014
- Rebecca Zeitz, MS, 2014
- Ankit Singh, MS, 2012
- Robert Hagan, MS, 2011
- William McConnell, MS, 2008
- Jaishankar Sundararaman, MS, 2008
- Khaled Hussein, MS, 2007
- Ryan McMahan, MS, 2007
- Richard Travis Rose, MS, 2007
- Hyun Seung Yoo, MS, Dept. of ISE, 2007
- Alain Fabian, MS, 2006
- Dheva Raja, MS, 2006
- Johnny Sam Rajkumar, MS, 2006
- Yogita Bhardwaj, MS, 2005
- Junghan Kwak, MS, Dept. of Civil Engineering, 2005
- John Lucas, MS, 2005
- Ananth Raghavan, MS, 2005
- Scott Alexander Turner, MS, 2005
- Brandon Berry, MS, 2004
- Dhruv Manek, MS, 2004
- Hussein Vastani, MS, 2004

- Chuck Holbrook, MS, 2003
- Reenal Mahajan, MS, 2003
- Ameya Datey, MS, 2002
- Benjamin Hays, MS, Dept. of Civil Engineering, 2002
- Ashwini Pande, MS, 2002
- Purvi Saraiya, MS, 2002
- Jun Wang, MS, 2002
- Qinwei Zhu, MS, 2002

Teaching:

- CS 2604 Data Structures and File Processing, undergraduate, (Fall '00, Fall '01, Spring '03, Spring '06)
- CS 3114 Data Structures and Algorithms, undergraduate, (Spring 2010, Fall 2010, Spring 12, Spring 2014)
- CS 3724 Introduction to Human-Computer Interaction, undergraduate, (Spring '02, Fall '02, Spring '04, Fall '04, Fall 06, Spring 08, Fall 09) [revised]
- CS 3744 GUI Programming and Graphics, undergraduate, (Spring 2011, Fall 11) [revised]
- CS 4604 Introduction to Database Management Systems, undergraduate, (Spring '04) [revised]
- CS 5764 Information Visualization, graduate, (Spring '01, Fall '01, Fall '02, Fall '03, Fall '04, Fall 05, Spring 07, Fall 07, Fall 09, Fall 11, Fall 12) [new]
- CS 6604/6724 Visual Analytics, graduate, (Fall 2010, Fall 2013) [new]
- CS 6724 Display Wall User Interfaces, graduate, (Spring '06) [new]

Professional Service:

Editorships:

- Editorial Board Member, *Foundations and Trends in Human Computer Interaction (FnT-HCI)*, 2012-2016.
- Associate Editor, *Information Visualization*, 2011 - present.
- Associate Editor, *IEEE Transactions on Visualization and Computer Graphics (TVCG)*, 2010 - 2011.
- Guest co-editor, IJHCI Festschrift special issue honoring Ben Shneiderman, Dec 2007.
- Guest co-editor, Information Visualization special issue on “Bioinformatics Visualization”, Sept 2005.

Conference Organizing Committees:

- Papers Co-Chair, IEEE VAST 2013, 2014
- Best Paper Committee, IEEE BioVis 2011
- Co-Organizer of the first annual IEEE BioVis Symposium 2011

- Session Chair, IEEE InfoVis 2010
- Best Poster Committee, InfoVis 2010
- General Co-Chair, IEEE VisWeek 2009
- General Chair, IEEE InfoVis 2009
- Papers Co-Chair, IEEE InfoVis 2008
- Papers Co-Chair, IEEE InfoVis 2007
- Session Chair, ACM CHI 2007
- Publications Co-Chair, IEEE InfoVis 2006 and IEEE Visualization 2006
- Session Chair, IEEE Visualization 2006
- Posters Co-Chair, IEEE InfoVis 2005
- Posters Co-Chair, IEEE InfoVis 2004
- Session Chair, IEEE InfoVis 2004

Workshops and Panels Organized:

- Co-Organizer, “Industrial Success Stories in the American Southeast - Visual Atlanta-lytics”, Panel at *IEEE Conference on Visual Analytics Science and Technology (VAST)*, Oct 2013.
- Co-Organizer, “Powerwall: Intl Workshop on Interactive, Ultra-High Resolution Displays”, Workshop at *ACM CHI*, April 2013.
- Co-Organizer, “Process+Interaction+Insight: Provenance in Visual Analytics”, Workshop at *ACM CHI*, May 2011.
- Co-Organizer, “Bring Your Own Data”, Working session at *VizBi, 2011*.
- Co-Organizer, "Challenges in Visualizing Biological Data", Panel at *IEEE VisWeek*, Oct 2010.
- Co-Organizer, "Research Agenda in Visualizing Biological Data", Birds-of-a-Feather meeting at *IEEE VisWeek*, Oct 2010.
- Co-Organizer, Dagstuhl Seminar on “Information Visualization - Human-Centered Issues in Visual Representation, Interaction, and Evaluation”, International Conference and Research Center for Computer Science at Schloss Dagstuhl, Germany, May 2007.
- Co-Organizer, "Is There Science in Visualization?", Panel at *IEEE Visualization Conference*, 2006. [Best Panel Award]
- Co-Organizer, “Workshop on Using Large, High-Resolution Displays for Information Visualization”, Workshop at *IEEE Visualization Conference*, 2005.
- Co-Organizer, “Evolving Visual Metaphors and Dynamic Tools for Bioinformatics Visualization”, Panel at *IEEE Visualization Conference*, 2002.

Invited Advisory Workshops:

- Member, DHS VACCINE, Visual Analytics Center of Excellence, 2010 – present.
- Invited participant, Google Faculty Summit, July 2012.
- Invited participant, “Human Dimensions in Cyber Operations: R&D Priorities Workshop”, DOE, Washington DC, August 2012.
- Invited participant, NSF Workshop on Science of Interaction, March 2012.
- Invited participant, NSA Symposium on Building Computer Science Research Partnerships, August 2009.

- Invited participant, DHS Future of Visual Analytics Workshop, March 2009.
- Invited participant, NSA Knowledge Computing Workshop, October 2007.
- Invited participant, NSF Workshop on Human-Centered Computing, Sept 2006.
- Invited participant, National Academies workshop on Visualizing Uncertain Information, Mar 2005.
- Invited participant, NSF/NIH Future Challenges in Visualization workshop, Sept 2004.

Advisory Boards:

- Advisory Board Member, WallViz Project, Department of Computer Science, University of Copenhagen, 2011-present.
- Member, NSF CISE/SBE Advisory Committee on Research Portfolio Analysis, 2009-2010.
- Advisory Board Member, Human-Computer Interaction Lab, University of Maryland, College Park, 2002.

Technical Program Committee:

- IEEE Information Visualization Conference (InfoVis), 2001, 2002, 2003, 2004, 2005, 2006, 2010, 2011, 2012
- IEEE Symposium on Biological Data Visualization (BioVis), 2011
- ISMB/ECCB 2011, Bioimaging and Data Visualization Area, 2011
- Workshop on Beyond Time and Errors: Novel Evaluation Methods for Visualization (BELIV), 2006, 2008, 2010, 2012, 2014
- Symposium on Visualization for Cyber Security (VizSec), 2005, 2006, 2009
- IEEE VGTC Pacific Visualization Symposium (PacificVis), 2008
- International Conference on Information Visualisation (IV), 2002, 2003, 2004, 2005
- International Conference on Coordinated & Multiple Views in Exploratory Visualization (CMV), 2003, 2004, 2005

Technical Reviewer:

- Funding Agencies:
 - NSF Panelist, 2004, 2007, 2009, 2010, 2011, 2012, 2013
 - DOE Panelist, 2009
 - American Association for the Advancement of Science
 - Swedish Foundation for Strategic Research, Sweden
- External P&T Evaluation letters: 6
- Journals:
 - ACM Journal of Educational Resources in Computing
 - ACM Transactions on Computer-Human Interaction
 - ACM Transactions on Interactive Intelligent Systems (TiiS)
 - Bioinformatics
 - Cell
 - Computers & Graphics

- HFES Human Factors
- IEEE Computer
- IEEE Computer Graphics & Applications
- IEEE Transactions on Visualization and Computer Graphics
- Information Visualization
- Intl. Journal of Human-Computer Interaction
- Intl. Journal of Human-Computer Studies
- Journal of Visual Languages and Computing
- Conferences:
 - ACM Conference on Computer Supported Cooperative Work and Social Computing (CSCW)
 - ACM Conference on Human Factors in Computing Systems (CHI)
 - ACM SIGGRAPH
 - ACM Symposium on User Interface Software and Technology (UIST)
 - Graphics Interface (GI)
 - IEEE Conference on Visual Analytics Science and Technology (VAST) [formerly IEEE Symposium on Visual Analytics Science and Technology]
 - IEEE Information Visualization Conference (InfoVis) [formerly IEEE Symposium on Information Visualization]
 - IEEE Scientific Visualization Conference (SciVis) [formerly IEEE Visualization Conference (Vis)]
 - IEEE Symposium on Biological Data Visualization (BioVis)
 - IEEE VGTC Pacific Visualization Symposium (PacificVis)
 - Intl. Conference on Coordinated and Multiple Views in Exploratory Visualization (CMV)
 - Intl. Conference on Information Systems for Crisis Response and Management (ISCRAM)
 - Intl. Conference on Information Visualization (IV)
 - Intl. Conference on Intelligent Systems for Molecular Biology (ISMB)
 - Intl. Conference on Knowledge Management and Knowledge Technologies (i-KNOW)
 - Intl. Working Conference on Advanced Visual Interfaces (AVI)
 - IS&T/SPIE Conference on Visualization and Data Analysis
 - Symposium on Visualization for Cyber Security (VizSec)
 - Workshop on Beyond Time and Errors: Novel Evaluation Methods for Visualization (BELIV)
 - Workshop on Knowledge and Information Visualisation (KIV)

University Service:

- Associate Director, Discovery Analytics Center, 2014-present.
- Executive Committee Member, Center for Human-Computer Interaction, 2011-present.
- Member, Faculty Search Committee for HCI/Vis, Dept. of Computer Science, 2013-2014.

- Chair, Faculty Search Committee for Cyber Security, Dept. of Computer Science, 2010-2011.
- Member, Faculty Search Committee for HCI/Vis, Virginia Bioinformatics Institute, 2010.
- Member, Undergraduate Program Committee, Dept. of Computer Science, 2013-present.
- Graduate Recruiting Coordinator, Dept. of Computer Science, 2005-2012.
 - C. North, N. Ramakrishnan, “Recruiting Doctoral Students in Computer Science”, proposals funded by College of Engineering, Virginia Tech; \$15,000 in 2010; \$12,000 in 2008; \$10,000 in 2007.
 - Developed fellowship applications for graduate applicants from under-represented groups.
- Member, Graduate Program Committee, Dept. of Computer Science, (2003-2012)
 - Chair, 5-year assessment of Dept.’s graduate program, 2005.
- Co-Advisor, Research in Gaming (RiG) student group, 2007
- Chair, HCI Ph.D. Qualifier Exam Committee, 2005, 2008, 2014.
- Co-Coordinator, Virginia Tech’s certification as NSA National Center of Academic Excellence in Information Assurance Education (NCAEIAE), 2005.
- Co-Coordinator, Virginia Tech’s certification as NSA National INFOSEC Education and Training Program, 2003.
- Faculty Advisor, Virtual Corporation undergraduate team, 2002.

- Head, Laboratory for Information Visualization and Evaluation (LIVE), Virginia Tech
- Head, GigaPixel Display Facility, Virginia Tech, 2004-present
- Member, Center for Human-Computer Interaction, Virginia Tech, 2000-present
- Member, Discovery Analytics Center, 2012-present
- Member, Hume Center for National Security and Technology, 2011-present
- Member, Genetics, Bioinformatics, and Computational Biology (GBCB) faculty, 2007-present