

Penny Rheingans

Professor

CSEE

UMBC

Awards and honors and year received (list--no more than *five* items):

- HERS Leadership Institute, 2014-2015
- University System of Maryland (USM) Regent's Mentoring Award, 2012
- Best Panel, IEEE VisWeek, 2012
- Best Paper, IEEE Visualization Conference, 2002
- Best Paper, IEEE Visualization Conference, 2000

Have you previously been involved in any CRA activities? If so, describe.

I have been a participant in activities of the CRAW. In particular, I was a member of the Cohort of Associate Professors Project (CAPP). I have attended two Snowbird Chairs workshops as a representative of my department.

List any other relevant experience and year(s) it occurred (list--no more than *five* items).

- Director, UMBC Center for Women in Technology, 2008-Present.
- Papers Co-Chair, Eurovis '13-'14 (Eurographics/IEEE-VGTC Conference on Visualization), 2012-2014.
- Associate Editor, IEEE Transactions on Visualization and Computer Graphics, 2007-2010.
- Founding Co-Chair, IEEE Vis/Infovis/VAST Doctoral Consortium, 2006-2008.
- Executive Committee, NIH-NSF Workshops on Visualization Research Challenges, 2004-2006

Research interests: (list only)

- Data visualization
- Diversity in Computing
- Computing Education
- Learning Analytics

Personal Statement

Penny Rheingans is Professor of CSEE and Director of the Center for Women in Technology (CWIT) at UMBC. She has a Ph.D. (UNC Chapel Hill) and AB (Harvard University). She has made seminal contributions to the field of data visualization in perceptual foundations, uncertainty visualization, and illustrative visualization. Leadership in her research community has included co-founding the IEEE Vis/Infovis/VAST Doctoral Colloquium and co-organizing the NIH/NSF Visualization Research Challenges workshops and report. As CWIT Director, she develops programs to increase diversity in the computing and engineering fields. In 2012, she was awarded the University System Maryland (USM) Regents Mentoring Award.

Brief Biography or CV

(Attached)

PENNY RHEINGANS

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410-740-9361

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EDUCATION

Ph.D. 1993 University of North Carolina, Chapel Hill, Computer Science
Advisor: Frederick P. Brooks, Jr.
M.S. 1988 University of North Carolina, Chapel Hill, Computer Science
A.B. 1985 Harvard University, Computer Science *cum laude*

PROFESSIONAL EXPERIENCE

Experience in Higher Education

2015-2016: Visiting Professor, Northeastern University.

**2009-Present: University of Maryland Baltimore County
Director, Center for Women in Technology.**

2008-2009: Interim Director, Center for Women and Information Technology.

Key Responsibilities:

- Oversee three Scholars programs to increase diversity in computing and engineering, with a total of 99 Scholars.
- Provide College and campus leadership on issues of diversity through service on College of Engineering and Information Technology (COEIT) Leadership Council and ADVANCE Executive Committee.
- Conduct externally funded research on the success of women (and men) in technology majors.

Key Accomplishments:

- Led interdisciplinary strategic planning process to define CWIT mission and goals to align with UMBC needs and priorities.
- Retained over 95% of Scholars in COEIT majors.
- Negotiated and managed budget for CWIT, including a five-fold increase in state allocation during my tenure (\$25,000 to \$145,000).
- Garnered over \$1,800,000 from government and industry sources to support CWIT initiatives in curriculum development, student support, and computing/engineering education research.
- Awarded the University System Maryland (USM) Regents Mentoring Award for 2012.

**2009-Present: University of Maryland Baltimore County
Professor, Computer Science and Electrical Engineering.**

2003-2009: Associate Professor, Computer Science and Electrical Engineering.

1998-2003: Assistant Professor, Computer Science and Electrical Engineering.

Key Responsibilities:

- Develop and teach graduate and undergraduate courses in computer graphics, data visualization, foundational computer science, and first-year computing.
- Conduct research in data visualization, computer science pedagogy, and diversity in technology.
- Provide leadership on issues of computing education, student success, faculty affairs,

faculty mentoring and development, and diversity.

Key Accomplishments:

- Established internationally recognized visualization research program supported by over \$9,000,000 in external funding as PI or CoPI, including NSF CAREER award.
- Published over 80 peer-reviewed articles, papers, and other publications.
- Chaired committee to develop departmental promotion and tenure procedures and standards for academic department spanning three distinct disciplines.
- Formalized procedures for computer science graduate admissions that were effectively used to make decisions about as many as 500 applicants per year.
- Mentored six students to PhD degree, thirteen students to MS degree, and 22 students in undergraduate research.
- Co-chaired papers program for Eurovis 2013 (Leipzig, Germany) and 2014 (Swansea, Wales), overseeing review, selection, and publication of 91 papers from 338 submissions to the premier European visualization publication venue.
- Co-founded IEEE Vis/Infovis/VAST Doctoral Colloquium to provide mentoring to PhD candidates in visualization at annual conference.
- Co-organized NIH-NSF Visualization Research Challenges workshops and co-authored resulting report.
- Served as Associate Editor for ACM Transactions on Applied Perception (2003 – 2015) and IEEE Transactions on Visualization and Graphics (2007 - 2010).

1995-1998: University of Mississippi
Assistant Professor, Computer and Information Science.

1989: University of North Carolina, Chapel Hill
Instructor, Computer Science.

1987 - 1991: Research Assistant, Walkthrough Project.

1986: Teaching Assistant, Computer Science.

1983-1985: Harvard University; Teaching Fellow; Computer Science.

Experience in Other than Higher Education

1991-1995: Lockheed Martin / US EPA Visualization Center; Visualization Specialist.
(Also: Martin Marietta, Unisys Corporation and Reidinger of Raleigh.)
Research scientist providing Agency-wide visualization research, development, support, and training.

1985 - 1986: Computer Corporation of America; Associate Systems Programmer
User environment designer and programmer for Database Designer, a design and evaluation workbench for database designers.

Honors Received

HERS Leadership Institute (Wellesley '14-'15).

Best Panel Award, IEEE VisWeek 2012. Min Chen, Kelly Gaither, Eduard Groller, Penny Rheingans, Matthew Ward. Quality of Visualization: The Bakeoff.

University System of Maryland Regents Mentoring Award, 2012.

Best Paper Award, IEEE Visualization '02. Aidong Lu, Christopher Morris, David Ebert, Penny Rheingans, Charles Hansen (2002). Non-photorealistic Volume Rendering Using Stippling Techniques, *Proceedings of IEEE Visualization '02*, pp. 211-218).

Best Paper Award, IEEE Visualization '00. David Ebert and Penny Rheingans (2000). Volume Illustration: Non-Photorealistic Rendering of Volume Models. *Proceedings of IEEE*

Visualization '00, IEEE Computer Society Press, October 2000, pp. 195-202.

Selected External Support

- MRI: Acquisition of CAVE2 Display for Discovery Science, Creativity, and Education, NSF \$360,000, September 2015 – August 2017. Lead PI: Jian Chen. CoPIs: Craig Saper, Karl Steiner, Michael Summers.
- SSTEM: A Diverse Community of Transfer Scholars in Computing and IT, NSF \$632,488, March 2015 – February 2020. Lead PI. CoPIs: Susan Martin (CWIT), Carolyn Seaman (IS), EF Charles LaBerge.
- TUES: Transforming the Freshman Experience of Computing Majors, NSF \$154,389, August 2012 – July 2015. Lead PI. CoPIs: Marie desJardins, Susan Martin (CWIT), Carolyn Seaman (IS).
- SSTEM: A Community of Transfer Scholars in Information Technology and Engineering (T-SITE), NSF \$599,977, March 2012 – February 2017. Lead PI. CoPIs: Anne Spence,(ME) Taryn Bayles (CBEE), Carolyn Seaman (IS), Gymama Slaughter.
- Planning: CE21 Maryland, NSF \$199,852, January 2012 – June 2013. Lead PI: Marie desJardins. CoPI: Penny Rheingans.
- CDI-Type II: GLOBE: Evolving New Global Workflows for Land Change Science, NSF \$1,929,993 (plus REU supplements of \$28,929), Duration: September 2011 – August 2015. Lead PI: Erle Ellis (GES). CoPIs: Wayne Lutters (IS), Tim Oates, Tim Finin, Anita Komlodi (IS).
- EAGER: Innovative Analysis and Visualization Approaches for Understanding Model Uncertainty, NSF \$102,999 (plus REU supplement of \$16,300). Duration: August 2010 – July 2012. Lead PI. CoPI: Marie desJardins.
- SSTEM: Scholarships in IT, NSF \$ 499,748. Duration: November 2007 – October 2011. Lead PI Taryn Bayles (CBE). CoPIs: Penny Rheingans, Anne Spence (ME), Michelle Wolfe.
- Interactive Visual Methods for Partitioning Multidimensional Spatial Data, NSF \$385,000. Duration: September 2005 – August 2008. Lead PI: Marie desJardins. CoPI: Penny Rheingans.
- Motion-Based Visualizations for Exploration and Deep Understanding of Relational, Spatio-Temporal Data, Disruptive Technologies Office Activity (DTO), \$(amount classified). Duration: September 2005 – August 2007. Lead PI: Tim Oates. CoPIs: Penny Rheingans, Marie desJardins.
- Visualization for Intrusion Detection. National Security Agency, \$249,689. Duration: September 2002 – August 2003. Lead PI. Co-PIs John Pinkston, Anita Komlodi (IS), and Andrew Sears (IS).
- Identifying and Visualizing Changing Patterns in Linked Data. Advanced Research and Development Activity (ARDA), \$(amount classified). Duration: September 2002-August 2004. Lead PI. Co-PIs Tim Oates, Marie desJardins, Charles Nicholas, and Lisa Getoor (UMCP).
- ITR: Procedural Representation and Visualization Enabling Personalized Computational Fluid Dynamics. NSF, \$3,194,778. Duration September 2001 – August 2007. Lead PI: David Ebert (Purdue University). CoPIs: Kelly Gaither (Mississippi State University), John Hart (University of Illinois), David Marcum (Mississippi State University), and Ron Fedkiw (Stanford University). I was sole PI on UMBC portion for \$670,572.
- Center for Architectures for Data-driven Information Processing. Department of Defense, \$1,270,000. Duration: October 2001 – September 2003. With option year (October 2003-September 2004) of \$635,000. Lead-PI: Charles Nicholas. CoPIs: Penny Rheingans, Ethan

Miller.

ITR: Volume Illustration. NSF, \$448,863. Duration: September 2000 – August 2003. Lead PI. Co-PI: David Ebert (Purdue University). UMBC portion \$250,635.

CAREER: Multivariate Visualization of Importance-varying Data. NSF, \$238,000. Duration: March 1997 - February 2002. Sole PI.

MPWG: Girls into Science and Technology. NSF, \$99,803. Duration: January 1997 - June 1998. Lead PI: Pamela Lawhead. Co-PIs: Penny Rheingans, Dawn Wilkins, Constance Bland (all University of Mississippi, Department of Computer and Information Science).

STUDENTS

Ph.D. Students Advised

Christopher Morris, May 2014. Now at Northrup Grumman.

Dana Wortman, May 2014. Now on the faculty of the University of Colorado, Colorado Springs.

David Trimm, May 2012. Now at NSA.

Jesus Caban, December 2009. Now at US Navy Brain Trauma Center.

Alark Joshi, December 2007. Now on the faculty of the University of San Francisco.

Eleanor Chlan, May 2005. Now on the faculty of Johns Hopkins University.

Master's Students

I have served as research advisor for 21 students who earned the MS degree: Matt Fioravante, Shari (Holstege) Rolnick, Jon Bronson, Ryan Bergeron, Jason Pearlman, Kamalika Das, Simone Thomas, Poonam Shanbhag, Srinivas Bhagavatula, Utkarsha Ayachit, Amit Joshi, Namita Parab, Andrej Cedilnik, Jay Patel, Pratik Phadke, Chun-yi Evelyn Wang, Yun Wan, Lei Cai (University of Mississippi), Shrikant Joshi (University of Mississippi), Aaron Rodden (University of Mississippi), Xinwei Hao (University of Mississippi), Yi Mao (University of Mississippi).

Undergraduate Students

I also regularly supervise undergraduate research. Undergraduates who have conducted research as part of my lab include (those resulting in refereed publications in bold): **Andrej Cedilnik**, Michelle Bangwa, Steven Saucier, **Gevorg Grigoryan**, **Bradley Lowenkamp**, Nathan Smith, Grant Wagner, Katherine Hirsch, Tristin Celestin, **Andrew Hunt**, **Eric Jordan**, Jonathan Decker, **Jon Bronson**, Nkenge Wheatland, Max Morawski, Chris Cahoon, **Wallace Brown**, **Alex Morrow**, **Doug Stull**, Brian Tice, David Raabe, Shawn O'Brien, Katie Dillon, Jacob Riehl, Caroline Kery.

SELECTED PUBLICATIONS

(In visualization and graphics, it is customary to list the primary author first. It is my personal practice to generally list student names first, even if I could be considered primary author. Student names are listed in bold.)

Books and Book Chapters

Penny Rheingans, Marie desJardins, **Wallace Brown**, **Alex Morrow**, **Doug Stull**, and **Kevin Winner** (2014), Visualizing Uncertainty in Predictive Models, in *Scientific Visualization: Uncertainty, Multifield, Biomedical, and Scalable Visualization*, Charles D. Hansen, Min Chen, Christopher R. Johnson, Arie Kaufman, and Hans Hagen (Eds.), Springer-Verlag Inc,

- Mathematics and Visualization Series, pp. xx-xx, 2014. ISBN 978-1-4471-6496-8.
- Georges-Pierre Bonneau, Gordon Kindlmann, Hans-Christian Hege, Chris R. Johnson, Manuel Oliveria, Kristin Potter, and Penny Rheingans (2014), Overview and State-of-the-Art of Uncertainty Visualization, in *Scientific Visualization: Uncertainty, Multifield, Biomedical, and Scalable Visualization*, Charles D. Hansen, Min Chen, Christopher R. Johnson, Arie Kaufman, and Hans Hagen (Eds.), Springer-Verlag Inc, Mathematics and Visualization Series, pp. xx-xx, 2014. ISBN 978-1-4471-6496-8.
- Penny Rheingans, **Blazej Bulka**, and Marie desJardins (2011), Visualizing Spatial Partitions, in *Scientific Visualization: Interactions, Features, Metaphors (Dagstuhl Follow-Ups)*, Hans Hagen, ed., Schloss Dagstuhl--Leibniz-Zentrum fuer Informatik, pp. 311-321, 2011. ISBN 978-3-939897-26-2.
- Jason Pearlman** and Penny Rheingans, Visualizing network security events using compound glyphs from a service-oriented perspective, in *VizSEC2007*, John Goodall, Gregory Conti, and Kwan-Liu Ma, eds., Springer-Verlag Inc., Mathematics and Visualization Series, pp. 131-146, 2008. ISBN 978-3-540-78242-1.
- Chris Johnson, Hanspeter Pfister, Tamara Munzner, Robert Moorhead, Penny Rheingans, Terry Yoo (2006). *NIH-NSF Visualization Research Challenges Report*. IEEE Press, ISBN 0-7695-2733-7, 2006.
- David Ebert and Penny Rheingans (2003), Procedural volume modeling, rendering, and visualization. *Data Visualization: The State of the Art*. Kluwer 2003, Frits H. Post, Gregory M. Nielson, Georges-Pierre Bonneau (Eds.), pp. 317-332, ISBN 1-4020-7259-7.
- Robert Moorhead and Penny Rheingans (1999). Vision and Visualization. *Electronic Imaging Technology*. E.R. Dougherty, ed. SPIE Optical Engineering Press, pp. 83-119.
- Penny Rheingans and Chris Landreth (1995). Perceptual Principles for Effective Visualizations. *Perceptual Issues in Visualization*, Georges Grinstein and Haim Levkowitz, eds., Springer-Verlag, pp. 59-74.
- William Hibbard, Haim Levkowitz, Janet Haswell, Penny Rheingans, and Florian Schroeder (1995). Interaction in Perceptually-Based Visualization. *Perceptual Issues in Visualization*, Georges Grinstein and Haim Levkowitz, eds., Springer-Verlag, pp. 23-32.
- Forrest W. Young and Penny Rheingans (1991). High-Dimensional Depth-Cuing for Guided Tours of Multivariate Data. *Computing and Graphics in Statistics*, A. Buja, and P. Tukey, eds., Springer-Verlag, pp. 239-252.

Journals

- Matt Fioravante**, **Adam Shook**, Ian Thorpe, and Penny Rheingans, Visualizing Motional Correlations in Molecular Dynamics using Geometric Deformations (2013), *Computer Graphics Forum* (Eurovis 2013), vol. 32, no. 3, pp. 311-320.
- David Trimm**, Marie desJardins, and Penny Rheingans (2012), Visualizing Student Histories Using Clustering and Composition, *IEEE Transactions on Visualization and Computer Graphics*, vol. 18, no. 12, pp. 2809-2818.
- Jesus Caban**, Penny Rheingans, and Terry Yoo (2011), An Evaluation of Visualization Techniques to Illustrate Statistical Deformation Models, *Computer Graphics Forum* (Eurovis 2011), vol. 30, no. 3, pp. 821-830.
- Penny Rheingans, Anne Brodsky, **Jill Scheibler**, and Anne Spence (2011). The Role of Majority Groups in Diversity Programs, *ACM Transactions on Computing Education*. vol. 11, no. 2, July 2011.

- Alark Joshi, Jesus Caban**, Penny Rheingans, and Lynn Sparling (2009). Case Study on Visualizing Hurricanes Using Illustration-Inspired Techniques, *IEEE Transactions on Visualization and Computer Graphics*, vol. 15, no 5, pp. 709-718.
- Jesus Caban** and Penny Rheingans, Texture-based Transfer Functions for Direct Volume Rendering (2008), *IEEE Transactions on Visualization and Computer Graphics*, vol. 14, no. 6, pp. 1364-1371.
- Alark Joshi** and Penny Rheingans (2008), Evaluation of illustration-inspired techniques for time-varying data visualization, *Computer Graphics Forum*, vol. 27, no. 3, pp. 999-1006.
- Marie desJardins, **Blazej Bulka, Ryan Carr, Eric Jordan, Priyang Rathod**, and Penny Rheingans (2008), "Heuristic search and information visualization methods for school redistricting." *AI Magazine*, vol. 28, no. 3, pp. 59-72.
- Jesus Caban, Alark Joshi**, and Penny Rheingans (2007), Texture-based feature tracking for effective time-varying data visualization, *IEEE Transactions on Visualization and Computer Graphics*, vol. 13, no. 6, pp. 1472-1479.
- Jason Pearlman**, Penny Rheingans, and Marie desJardins (2007), Visualizing Diversity and Depth over a Set of Objects, *IEEE Computer Graphics and Applications*, vol. 27, no. 5, pp. 35-45.
- Dana Wortman** and Penny Rheingans (2007), Visualizing trends in student performance across computer science courses, *SIGCSE Bulletin* vol. 39, no. 1, pp. 430-434.
- Robert Moorhead, Chris Johnson, Tamara Munzner, Hanspeter Pfister, Penny Rheingans, and Terry S. Yoo (2006). Visualization Research Challenges: A Report Summary, *Computing in Science and Engineering*, vol. 8, no. 4, pp. 66-73, July/August 2006.
- Tamara Munzner, Chris Johnson, Hanspeter Pfister, Robert Moorhead, Penny Rheingans, and Terry S. Yoo (2006). NIH-NSF Visualization Research Challenges Report Summary, *IEEE Computer Graphics and Applications*, vol. 26, no. 2, pp. 20-25, March/April 2006. Invited paper.
- John R. Goodall**, Wayne G. Lutters, Penny Rheingans and Anita Komlodi (2006), Focusing on Context in Network Traffic Analysis, *IEEE Computer Graphics and Applications*, vol. 26, no. 2, pp. 72-80, March/April 2006.
- Gevorg Grigoryan** and Penny Rheingans (2004). Point-based Probabilistic Surfaces to Show Surface Uncertainty, *IEEE Transactions on Visualization and Computer Graphics*, no. 10, vol. 5, 2004, pp. 564-573.
- Penny Rheingans (2004). Expressive Volume Rendering, *Journal of WSCG*, vol. 12, no. 1, pp. 7-10, February 2004. Invited paper.
- Aidong Lu, Christopher Morris, Joe Taylor**, David Ebert, Charles Hansen, Penny Rheingans, and **Mark Hartner** (2003). Illustrative Interactive Stipple Rendering, *IEEE Transactions on Visualization and Computer Graphics*, vol.9, no. 2, pp. 127-138, April-June 2003.
- David Ebert, **Christopher Morris**, Penny Rheingans, and Terry Yoo (2002). Designing Effective Transfer Functions for Volume Rendering from Photographic Volumes, *IEEE Transactions on Visualization and Computer Graphics*, vol. 7, pp. 183-197.
- Penny Rheingans (2002). Are We There Yet?: Exploring with Dynamic Visualization, *IEEE Computer Graphics and Applications*, vol. 22, no. 1, January/February 2002, pp. 6-10. Invited paper.
- Penny Rheingans and David Ebert (2001). Volume Illustration: Nonphotorealistic Rendering of Volume Models, *IEEE Transactions on Visualization and Computer Graphics*, July-

September 2001, pp.253-264.

John Nichols, Penny Rheingans, Douglas Lothenbach, Robert McGeachie, Loren Snow, and James McKim (1994). 3-Dimensional Visualization of Physiologically-Based Kinetic Model Outputs. *Environmental Health Perspectives*, vol. 102, no, 11, pp. 952-956.

Theresa Rhyne, Mark Bolstad, Penny Rheingans, Lynne Petterson, and Walter Shackelford (1993). Visualizing Environmental Data at the EPA. *IEEE Computer Graphics and Applications*, March 1993, pp. 34-38.

Forrest W. Young and Penny Rheingans (1991). Visualizing Structure in High-Dimensional Multivariate Data with Dynamic Statistical Graphics. *IBM Journal of Research and Development*, vol. 35, no. 1/2, pp. 97-107.

Refereed Papers in Selective Conferences, Symposia, and Workshops

(In most disciplines of computer science (including visualization and graphics), selective refereed conferences are as important (or more important) than journals as influential venues for publication. In such cases, full paper submissions are peer-reviewed by three to five reviewers and acceptance rates are typically in the 10% to 35% range.)

Jesus Caban, Penny Rheingans, and Terry Yoo (2010), An MRF-based Statistical Deformation Model for Morphological Image Analysis, IEEE Computer Society Workshop on Mathematical Methods in Biomedical Image Analysis (MMBIA) 2010, June 2010, pp. 31-38.

Jesus Caban and Penny Rheingans (2010), Relational Statistical Deformation Models for Morphological Image Analysis and Classification, *IEEE International Symposium on Biomedical Imaging*, April 2010, pp. 1333 - 1336.

Jonathan Bronson, Penny Rheingans, and Marc Olano, Semi-Automatic Stencil Creation through Error Minimization, *Non-photorealistic Animation and Rendering Symposium (NPAR 2008)*, ACM Press, pp. 31-37.

John Kloetzli, Marc Olano, and Penny Rheingans (2008), Interactive Volume Isosurface Rendering using BT Volumes, *ACM Symposium on Interactive 3D Graphics (I3D) 2008*, p. 45-52.

Jason Pearlman and Penny Rheingans (2007). Visualizing network security events using compound glyphs from a service-oriented perspective, *Visualization for Computer Security (VizSec) 2007*.

Marie desJardins, **Blazej Bulka**, **Ryan Carr**, **Andrew Hunt**, **Priyang Rathod**, and Penny Rheingans, “Heuristic search and information visualization methods for school redistricting.” In *Proceedings of the Eighteenth Annual Conference on Innovative Applications of Artificial Intelligence (IAAI-06)*, AAAI Press, 2006. *Invited to submit an extended version to AI Magazine’s annual issue on Best Papers from IAAI-06.*

Alark Joshi and Penny Rheingans (2005), Illustration-inspired techniques for visualizing time-varying data, *Proceedings of IEEE Visualization 2005*, pp. 679-686.

Poonam Shanbhag, Penny Rheingans, and Marie desJardins (2005). Temporal Visualization of Planning Polygons for Efficient Partitioning of Geo-Spatial Data, *Proceedings of IEEE Information Visualization '05*, pp. 211-218.

Eleanor Chlan and Penny Rheingans (2005). Multivariate Glyphs for Multi-Object Clusters. *Proceedings of IEEE Information Visualization '05*, pp. 141-148.

Anita Komlodi, Penny Rheingans, **Utkarsha Ayachit**, **John R. Goodall**, **Amit Joshi** (2005), A

- User-centered Look at Glyph-based Security Visualization, *Proceedings of Visualization for Computer Security 2005*, pp. 21-28.
- John R. Goodall**, Wayne G. Lutters, Penny Rheingans and Anita Komlodi (2005), Preserving the Big Picture: Visual Network Traffic Analysis with TNV, *Proceedings of Visualization for Computer Security 2005*, pp. 47-54.
- Srinivas Bhagavatula**, Penny Rheingans, and Marie desJardins (2005). Discovering High-level Parameters for Visualization Design, *Proceedings of Joint EUROGRAPHICS - IEEE TCVG Symposium on Visualization*, pp. 255-262.
- Eleanor Chlan** and Penny Rheingans (2004). A Botanically Inspired High-Dimensional Visualization with Multivariate Glyphs, *Proceedings of Joint EUROGRAPHICS - IEEE TCVG Symposium on Visualization*.
- Gevorg Grigoryan** and Penny Rheingans (2002). Probabilistic Surfaces: Point Based Primitives to Show Surface Uncertainty, *Proceedings of IEEE Visualization '02*, pp. 147-154.
- Aidong Lu, Christopher Morris**, David Ebert, Penny Rheingans, Charles Hansen (2002). Non-photorealistic Volume Rendering Using Stippling Techniques, *Proceedings of IEEE Visualization '02*, pp. 211-218). Best Paper Award.
- Brad Lowekamp**, Penny Rheingans, and Terry S. Yoo (2002). Exploring Surface Characteristics with Interactive Gaussian Images (A Case Study), *Proceedings of IEEE Visualization '02*, pp. 553-556.
- Bryan Morse, Terry S. Yoo, Penny Rheingans, David T. Chen, K.R. Subramanian (2001). Interpolating Implicit Surfaces from Scattered Surface Data Using Compactly Supported Radial Basis Functions. *Proceedings of International Conference on Shape Modeling and Applications '01*, IEEE Computer Society Press, May 2001, pp. 89-98.
- David Ebert and Penny Rheingans (2000). Volume Illustration: Non-Photorealistic Rendering of Volume Models. *Proceedings of IEEE Visualization '00*, IEEE Computer Society Press, October 2000, pp. 195-202. Best Paper Award.
- Penny Rheingans and Marie desJardins (2000). Visualizing High-Dimensional Predictive Model Quality. *Proceedings of IEEE Visualization '00*, IEEE Computer Society Press, October 2000, pp. 493-496.
- Andrej Cedilnik** and Penny Rheingans (2000). Procedural Annotation of Uncertain Information. *Proceedings of IEEE Visualization '00*, IEEE Computer Society Press, pp. 77-84.
- David Ebert, **Tim McClanahan**, Penny Rheingans, and Terry Yoo (2000). Direct Volume Rendering of Photographic Data. *Data Visualization '00, Proceedings of the Joint Eurographics and IEEE TCVG Symposium on Visualization*, pp. 137-146.
- Terry Yoo and Penny Rheingans (1999). Digital Design of a Surgical Simulator for Interventional Magnetic Resonance Imaging, *Proceedings of IEEE Visualization '99*, pp. 393-396.
- Penny Rheingans and **Shrikant Joshi** (1999). Visualization of Molecules with Positional Uncertainty, *Data Visualization '99, Proceedings of the Joint Eurographics and IEEE TCVG Symposium on Visualization*, pp. 299-306.
- Penny Rheingans (1997). Dynamic Color Mapping of Bivariate Qualitative Data. *Proceedings of IEEE Visualization '97*. IEEE Computer Society Press, pp. 159-166.
- Dan Drake, Thomas Simpson, Larry Smithmier**, and Penny Rheingans (1997). Determination of Unknown Particle Charges in a Thunder Cloud Based Upon Detected Electric Field

- Vectors. *Proceedings of IEEE Visualization '97*. IEEE Computer Society Press, pp. 479-482.
- Penny Rheingans (1996). Opacity-modulating Triangular Textures for Irregular Surfaces. *Proceedings of IEEE Visualization '96*, IEEE Computer Society Press, pp. 219-225.
- Penny Rheingans and John Nichols (1995). Interactive 3D Visualization of Actual Anatomy and Simulated Chemical Time-course Data for Fish. *Proceedings of IEEE Visualization '95*, IEEE Computer Society Press, pp. 393-396.
- Penny Rheingans (1992). Color, Change, and Control for Quantitative Data Display. *Proceedings of IEEE Visualization '92*, IEEE Computer Society Press, pp. 252-259.
- Penny Rheingans and Brice Tebbs (1990). A Tool for Dynamic Exploration of Color Mappings. *Proceedings of the 1990 Symposium on Interactive 3D Graphics, Computer Graphics*, vol. 24, no. 2, pp. 145-146.
- David Reiner, Gretchen Brown, Mark Friedell, John Lehman, Richard McKee, Penny Rheingans, and Arnon Rosenthal (1986). A Database Designer's Workbench. *Fifth International Conference on the Entity Relationship Approach* (Dijon, France, Nov. 17-19, 1986), pp. 347-360. ISBN 0-444-70255-5.

Creative Achievements -- Juried Works

- Jesus Caban, Alark Joshi, and Penny Rheingans (2007). Texture-based Feature Tracking for Effective Time-varying Data Visualization. Scientific Animation Theater at IEEE Visualization 2007 (Joerg Meyer, jury chair), Sacramento CA, October 2007. Video animation.
- Alark Joshi, Jesus Caban, Penny Rheingans, and Lynn Sparling (2006). "Illustrative Visualization of Hurricane Katrina", Scientific Animation Theater at IEEE Visualization 2006 (Joerg Meyer, jury chair), Baltimore MD, October 2006. Video animation.
- Terry Yoo, Penny Rheingans, David T. Chen, Marc Olano, and Bradley Lowekamp (2006). Animated Embroidery: A Teapot in Modern Blackwork. ACM SIGGRAPH Teapot Exhibit (Marc J. Barr, exhibit chair), Boston MA, July-August 2006. Installation.
- John Rohlf, John Airey, and Penny Rheingans (1989). The Virtual Lobby. *ACM SIGGRAPH Computer Graphics Theater*, issue 51, Boston MA, July-August 1989. Video animation.

SELECTED PROFESSIONAL SERVICE

Service to the Department

- 2014 – 2015:** Chair, CS/IS Lecturer Search Committee.
- 2012-2014:** Chair, CSEE Ad Hoc Committee on Undergraduate CS Curriculum.
- 2011-2012:** Chair, CSEE Department Promotion and Tenure Committee.
- 2011:** Chair, CSEE Ad Hoc Committee on Promotion and Tenure Standards.
- 2010-2015:** Member, CSEE Executive Committee.
- 2003-Present:** Member, CSEE Department Promotion and Tenure Committee. Chaired subcommittee for third year review and tenure of Marc Olano (2005, 2008).
- 2001-2004:** Chair, CS Graduate Admissions Committee.
- 1999-2007:** Member, CS Graduate Admissions Committee.
- 1998-2011:** Member, CS Graduate Committee.

Service to the University

2014-Present: Member, Innovation in Teaching and Pedagogy Strategy Group.
2013-2014: Member, COEIT Dean Search Committee.
2013-Present: Member, Imaging Research Center Advisory Board.
2010-Present: Member, UMBC ADVANCE Executive Committee.
2008-Present: Director, Center for Women in Technology.
2008-Present: Member, COEIT Leadership Council.
2008-2010: Member, Faculty Affairs Committee.
2007-2008: Vice President, Faculty Senate.
2007-2009: Member, UMBC Retention Task Force.
2006-2008: Member, UMBC Faculty Senate Executive Committee.
2005-2008: Member, Provost's Planning Leadership Team.
2005-2006: Member, UMBC Undergraduate Council.
2000-2006: Founding Steering Committee Member, Women in Science and Engineering.
1999-2001: Member, (UMBC) President's Commission for Women.

Service to the Profession

2014-Present: Ethics Officer, IEEE-VGTC.
2012-2014: Papers Co-Chair, Eurovis '13-'14 (Eurographics/IEEE-VGTC Conference on Visualization).
2012-2015: Program Committee, IEEE Visualization 2012-2015.
2011-Present: Co-Organizer, 2014 and 2017 Dagstuhl Seminar on Scientific Visualization.
2007-2009: Panels Co-Chair, IEEE VisWeek 2008-2009.
2007-2010: Associate Editor, IEEE Transactions on Visualization and Computer Graphics.
2006-2009: Program Committee, IEEE Visualization '07-'09.
2006-2008: Founding Co-Chair, IEEE Vis/Infovis/VAST Doctoral Consortium.
2006-2008: Programme Committee, Workshop on Visualization for Cyber Security (VizSEC) '07-'08.
2005-2012: Program Committee, 2006-2012 IEEE Conference on Information Visualization.
2005-2006: Contingency Chair, 2006 Visual Analytics Software and Technology (VAST) Symposium.
2005-2010: Program Committee, Eurovis '06-'10 (Eurographics/IEEE-VGTC Symposium on Visualization).
2004-2006: Executive Committee, NIH-NSF Workshops on Visualization Research Challenges.
2003-2015: Associate Editor, ACM Transactions on Applied Perception.
2002-2005: Executive Committee, IEEE Technical Committee on Visualization and Graphics.
2001-04: Program Committee, IEEE Visualization '02-'04.
2000-02: Tutorials Co-Chair, IEEE Visualization '00, '01, and '02.
1999-Present: Panelist for National Science Foundation. Specific programs include CAREER, ITR, ACIR, CCF-CPA, MRI, and CRI.