Cumulative Bio-Bibliography
University of California, Santa Cruz, CA
June 22, 2020
Alex Pang
Professor
Computer Science Department

Signature indicates the following information has been reviewed for accuracy and bio-bibliography information may ____ or may not ____ be released to the public.

Signature _____ Date _____

EMPLOYMENT HISTORY

2005–07	CITRIS Chief Scientist for UCSC, CITRIS, University of California
2003–	Professor, Computer Science Department, University of California, Santa Cruz
1997–03	Associate Professor, Computer Science Department, University of California, Santa Cruz
1990–97	Assistant Professor, Computer Science Department, University of California, Santa Cruz
9/89–91	Consultant, Los Alamos National Laboratory, New Mexico.
6/89–6/90	Research Assistant, UCLA Computer Science Department.
6/89–9/89	Graduate Research Assistant, Los Alamos National Laboratory.
6/88–9/88	Summer Intern, IBM T.J. Watson Research Center, Yorktown Heights, NY.
11/86–4/88	Senior Programmer, UCLA Department of Surgery.
11/84–8/86	Software Scientist, Multiplanar Diagnostic Imaging, Inc., Torrance, CA.
1/82–6/84	Teaching Associate, UCLA Computer Science Department.

EDUCATION

Ph.D.	1990	University of California at Los Angeles, Computer Science
M.S.	1984	University of California at Los Angeles, Computer Science
B.S.	1981	University of the Philippines, Industrial Engineering – magna cum laude

HONORS AWARDS GRANTS

2020-2021	Citris Seed, Pending: "Am I really infected? Am I really immune? (How should I interpret Covid19 tests?)", $31,301.92.
2020-2021	Citris Seed, Pending: "Methods for Robust Detection of Rip Currents", $60,000. With James Davis and Shawn Newsam (UC Merced).
2020-2023	NSF ASCENT, Pending: "Collaborative Research: Next-Generation Wildland Fire Detection, Management, and Prediction". $500,000. Katia Obraczka (PI).
2020-2022	UCSC RSF, Pending: "The Fires Next Time". $75,000. Joshua Harrison (PI).

2020-2022 UCSC RSF, Pending: "The Applied Artificial Intelligence Initiative". $75,000. J. Xavier Prochaska (PI).

2020-2022 NSF IIS - AI Research Institutes, Pending: "AI Institute Planning: The Applied Artificial Intelligence Initiative – Planning the Development from Initiative to Institute". $445,233. Xavier Prochasca (PI).

2020-2023 NOAA OTT, Pending: "Launching WebCOOS, Webcams for Coastal Observations and Operational Support". $251,243. With Debra Hernandez (SECOORA) and Greg Dusek (NOAA).

2020-2021 Google Faculty Research Award, Pending: "Methods for Robust Detection of Rip Currents". $53,000. With Peyman Milanfar.

2020-2023 UC-LANL, Pending: "Center for Emergency - Fire Control Technologies". PI: Tarek Zohdi.

2020 UCSC Re-entry Scholarship, "Equipment Support for Fahim Khan". $1,500.

2019 Merrill Research Mentorship, Improving the Uncertainty Cone, with David Crosby (Merrill). $800.

2017–2018 UCSC COR/FRG, "Robust Realtime Rip Current Detection", $1,500

2014–2015 UCSC Board Opportunity Funds, "Reducing innumeracy by creating a visual language that complements textual and numerical presentations", $5,000

2014–2015 NASA/ARP, "Understanding and Exploring Data Mining Results" $51,000

0 academic, 0 summer months.

2012–2013 UARC/ARP, "Design, Extension and Evaluation of Conflict Resolution Strategies of UAS in the NAS", with Gabriel Elkaim $92,890. 0 academic, 0 summer months.

2011 DOE, "Funding to support Working with Uncertainty Workshop", $10,000.

2011–2013 NSF/CISE, "Collaborative Research Supplement: Foundations of Comparative Analytics for Uncertainty in Graphs", $74,999.

2010 NSF/REU, "Collaborative Research: Foundations of Comparative Analytics for Uncertainty in Graphs", $8,190.

2010 NASA/ARP, "Metrics and Comparisons of Flight Trajectories", $12,561.

2010 NASA/ARP, "Visualizing 3D Time Varying Air Traffic Data For UAS Planning", $7,709.

2010–2011 NSF/FODAVA, "Collaborative Research: Foundations of Comparative Analytics for Uncertainty in Graphs", with Lise Getoor and Lisa Singh, $137,500.

2010 ISSDM/LANL, ""Understanding Multi-Scale Multi-Streaming events in Cosmological Simulations" $25,000.

2009 ISSDM/LANL, "Finding Multi-streaming Events in Cosmological Simulations" $25,000.

2008 UCSC Instructional Improvement Grant, "Virtual Land Purchase in Second Life and Acrobat 3D software" $1,340.

2008 ISSDM/LANL, "Exploring Uncertainty Visualization in Large Data Sets (renewal)" $25,000.

2007 ISSDM/LANL, "Exploring Uncertainty Visualization in Large Data Sets" $25,000.

2005 HP-CITRIS, "Request for HP-CITRIS funds to supplement existing NIH/Stanford-NASA supported medical education project", with Irwin Sobel (HPL), $10,000.

2005	UCSC/COT, "Development of a Project-Oriented Computer Game Design Course", Course Relief.
2004	NASA/UARC, "Understand Data Distributions", $47,470.
2004	NASA, Certificate of Recognition, NASA Tech Briefs Award for PDFVis.
2003	NSF/REU, "Summer Undergraduate Research Fellowships in Information Technology" (SURF-IT)" with Richard Hughey et al. $359,980.
2002	Certificate of Appreciation for service and commitment in support of undergraduate research, School of Engineering and Division of Natural Sciences, UCSC.
2001–2004	NASA/IS, "Comparing and Understanding Data Distributions in EOS Applications" with D. Kao, J. Dungan, and H.-W. Shen, $372,735.
2000	ONR/DRI, "Displaying Uncertainty in the Common Tactical Picture" $40,000.
2000–2003	NSF, "Interactive Tensor Field Visualization" $263,083.
2000	PACI/REU, "Gene Expression Viewer and Haptic Feedback" $12,000.
1998—2001	DOE/ASCI, "Quantifying and Visualizing Uncertainty in Large Scientific Data Sets" with S. Lodha, $876,000.
1998	Certificate of Appreciation for service and commitment in support of undergraduate research, Division of Natural Sciences, UCSC.
1998	UCSC Instructional Improvement Grant, "Living Virtual Notes" $2,500 with P. Mantey.
1998–2001	NASA Consortium Interchange, "Comparative Visualization of Experimental Wind Tunnel Data and Computational Fluid Dynamics Simulations" $155,413.
1997	Excellence in Teaching Award, Computer Science Department, UCSC.
1997	Nominated for Distinguished Teaching Award, UCSC.
1997	UCSC Committee on Research, Foreign travel award $1,000.
1997	NASA Joint Research Interchange, "Visual Methods for Model and Grid Validation" $37,000.
1997–2000	DARPA/ITO, "Nomadic Collaborative Visualization with Imprecise Information" $411,264.
1997–2002	NSF, "Interactive Visualization of Real-Time Databases" partner in the National Partnership for Advanced Computational Infrastructure (NPACI) with S. Flatte, P. Mantey, D. Long, $830,000.
1996–1999	ONR/AASERT, "Visualization Tools for Data Assimilation" $109,987.
1996	NASA Joint Research Interchange, "Uncertainty in Flow Visualization and Multiple Levels of Collaborative Visualization" $6,707.
1996	NSF/CISE, "Instrumentation Grants for Research in Computer and Information Science and Engineering: Request for Purchase of a CODAR SeaSonde" with D. Fernandez, P. Mantey, G. Langdon, L. Rosenfeld, and J. Paduan, $50,000.
1995–1998	NSF, "Visualizing Uncertainty in Scientific Data Displays" $360,000, additional funding of $14,995 through NSF/REU, with S. Lodha and C. Wittenbrink.
1995	UC Regent Junior Faculty Fellowship $2,600, and UC Affirmative Action Award $ 1,700. "Collaborative Visualization and Metaphors for Visualization".

1994	Sun Microsystems, "Proposal for UCSC CE/CIS Instructional and Research Use Color Printers" with J. Wilhelms and S. Lodha, $7,990.
1994	University of California, Pre-Tenure Award for "Virtual Reality Interface for Collaborative Visualization" $6,000.
1994	University of California, Instructional Improvement Grant for "Improving Undergraduate Software Development Tools" with C. McDowell and A. Van Gelder, $3,500.
1994	University of California, Instructional Improvement Grant for "Video Editing Facility" with J. Wilhelms and S. Lodha, $3,500.
1993	University of California, Instructional Improvement Grant for "Software for Computer Graphics" with J. Wilhelms and S. Lodha, $3,500.
1992–1997	ONR, "Real-time Environmental Information Network and Analysis System" with P. Mantey and D. Long, $4,549,371.
1992	UC Regent Junior Faculty Fellowship for "Simulation and Visualization of the Myocardium" $750.
1991	Intramural Seed Funds for "Wavelets Volume Rendering" $10,000.
1991	NSF/CISE for "Minority Graduate Fellowship" Honorable Mention (Michelle Denise Abram) $6,000.
1981	Phi Kappa Phi Honor Society

PUBLICATIONS

Note: In publications with co-authors, the following were students: Michelle Abram, Gbolahan Adesoye, Aishna Agrawal, Georg Albrecht, Naim Alper, Koji Amakawa, Ahmed Amer, Brian Billet, Ed Boring, Jeffrey Brainerd, Nathaniel Cesario, Eddy Chandra, Eric Charp, Michael Clifton, Jacob Cohen, Alex D'Angelo, Newton Der, Suzana Djurcilov, Adam Freeman, Jeff Furman, Tom Goodman, Nick Green, Edi Groeller, Marc Hansen, Robert Hero, Brad Hollister, Fan Hong, Matthew Jee, Abigail J. Joseph, Kwansik Kim, David Kulp, Chufan Lai, Dean Long, Alison Love (Luo), Xiaoguang Ma, William Macy, Adam Markowitz, Bryan Mealy, Bruce R. Montague, Alisa G. Neeman, Chris Oates, Michael O'Neil, Schweta Philips, Carles Pi-Sunyer, Uliana Popov, Jose C. Renteria, Eric Rosen, Elijah Saxon, Robert Sheehan, Qin Shen, Wei Shen, James Skorupski, Kyle Smith, Jim Spring, Jeremy Story, Jeffrey Sukharev, Aakash Thakkar, Vivek Verma, Doanna Weissgerber (Meads), Zöe Wood, Katarina Yang, Xiaohong Ye, Bing Zhang, Yani Zhang, Xiaoqiang Zheng, Laixin Zhou. *And the following co-authors were postdocs or other senior colleagues:* P. Abbot, James Ahrens, Adam Black, Rebecca Brannon, Bruce Bridgeman, Min Chen, C.-S. Chiu, Eva Chu, Jennifer Dungan, Gabriel Elkaim, Robert Erbacher, Daniel Fernandez, J.J. Garcia-Luna, G. Gawarkiewicz, Lise Getoor, William Gibb, William Glenn, Ashutosh Goel, Bruce Gritton, Salman Habib, P.J. Haley, Paul Han, Charles Hansen, Katrin Heitmann, Karin Hollerbach, Chang Sung Jeong, Boris Jeremić, Chris Johnson, David Kao, Hrayr Karagueuzian, Walter Karplus, Steven Khan, Boris Kogan, H.G. Kolsky, Marc Kramer, Yu-Ming Kuo (Azzawi), Glen Langdon, Jr., Robert Levinson, Hak Tae Lee, F. Lekien, Pierre F.J. Lermusiaux, Michael Lesh, W.G. Leslie, Suresh Lodha, Darrell D.E. Long, S. Majumdar, William J. Mandel, Patrick Mantey, Nelson Max, B. Miller, Bassam Mussafar, Wendell Nuss, Jeffrey Paduan, Hans-Georg Pagendarm, Beresford Parlett, Michael L. Rhodes, Alan Robinson, Claudio Silva, Lisa Singh, William G. Stevenson, Holger Theisel, Xavier Tricoche, Sam Uselton, Edi Groeller, Allen Van Gelder, Claudio Silva, Tino Weinkauf, Ross Whitaker, Craig Wittenbrink, Zöe Wood, Xiaoru Yuan.

Journal Articles

1. Yani Zhang and Alex Pang, "Graph Layout with Versatile Boundary Constraints", *Journal of Graph Algorithms and Applications*, Volume 20, Number 2, 2016, pages 435–459, DOI: 10.7155/jgaa.00401

2. Brad Hollister and Alex Pang "Bivariate Quantile Interpolation for Ensemble Derived Probability Density Estimates", *International Journal for Uncertainty Quantification*, Volume 5, Number 2, 2015, pages 123-137, DOI: 10.1615/Int.J.UncertaintyQuantification.2015011789.

3. Tino Weinkauf, Holger Theisel, Allen Van Gelder, and Alex Pang, "Stable Feature Flow Fields", *IEEE Transactions on Visualization and Computer Graphics*, Volume 17, Number 6, June, 2011, pages 770–780. Also selected for oral presentation at the 2011 IEEE Visualization conference.

4. Allen Van Gelder and Alex Pang, "Using PVsolve to Analyze and Locate Positions of Parallel Vectors", *IEEE Transactions on Visualization and Computer Graphics*, Volume 15, Number 4, July/August, 2009, pages 682–695.

5. P.F.J. Lermusiaux, C.-S. Chiu, G. Gawarkiewicz, P. Abbot, A. Robinson, B. Miller, P.J. Haley, W.G. Leslie, S. Majumdar, A. Pang, and F. Lekien, "Quantifying Uncertainties in Ocean Predictions", Oceanography, a special issue on *Advances in Computational Oceanography*, March 2006, volume 19, number 1, pages 80–93.

6. David Kao, Marc Kramer, Alison Love, Jennifer Dungan and Alex Pang, "Visualizing Distributions from Multi-Return Lidar Data to Understand Forest Structure", *The Cartographic Journal*, June 2005, volume 42, number 1, pages 35–47.

7. Xiaoqiang Zheng, Beresford Parlett, and Alex Pang, "Topological Lines in 3D Tensor Fields and Discriminant Hessian Factorization", *IEEE Transactions on Visualization and Computer Graphics*, Volume 11, Number 4, July/August, 2005, pages 395–407.

8. Alison Love, David L. Kao and Alex Pang, "Visualizing Spatial Multivalue Data", *IEEE Computer Graphics and Applications*, Volume 25, Number 3, May/June 2005, pages 69–79.

9. Wei Shen, Alex D'Angelo and Alex Pang, "Nature Inspired Flow Visualization", under revision for *Computers and Graphics*.

10. Vivek Verma and Alex Pang, "Comparative Flow Visualization", *IEEE Transactions on Visualization and Computer Graphics*, volume 10, number 6, 2004, pp. 609–624.

11. Qin Shen, Sam Uselton, and Alex Pang, "Comparison of Wind Tunnel Experiments and Computational Fluid Dynamics Simulations", *Journal of Visualization*, volume 6, number 1, 2003, pp. 31–39.

12. Suzana Djurcilov, Kwansik Kim, Pierre Lermusiaux, and Alex Pang, "Visualizing Scalar Volumetric Data with Uncertainty", *Computers and Graphics*, volume 26, number 2, 2002, pp. 239–248.

13. Kwansik Kim, Craig Wittenbrink and Alex Pang, "Extended Specifications and Test Data Sets for Data Level Comparisons of Direct Volume Rendering Algorithms", *Transactions on Visualization and Computer Graphics*, Vol. 7, No. 4, October-December, 2001, pp. 299–317.

14. Jeff Brainerd and Alex Pang, "Interactive Map Projections and Distortion", *Computers and Geosciences*, volume 27, pages 299–314, 2001.

15. Suzana Djurcilov and Alex Pang, "Visualizing Sparse Gridded Datasets", *IEEE Computer Graphics and Applications*, volume 20, number 5, September 2000, pp. 52–57.

16. Robert Erbacher and Alex Pang "Guest Editorial", *Journal of Electronic Imaging*, Special Issue on Visualization and Data Analysis, volume 9, number 4, October, 2000.

17. Michael Clifton and Alex Pang, "Cutting Planes and Beyond", *Computers & Graphics*, Vol. 21, No. 5, 1997, pp. 563–575.

18. Alex Pang, Craig Wittenbrink, and Suresh Lodha, "Approaches to Uncertainty Visualization", *The Visual Computer*, Vol. 13, No. 8, 1997, pp. 370–390.

19. Alex Pang and Craig M. Wittenbrink, "Collaborative 3D Visualization with CSpray", *IEEE Computer Graphics and Applications* special issue on "3D and Multimedia on the Information Superhighway", March, 1997, pp. 32–41.

20. Craig M. Wittenbrink, Alex T. Pang, and Suresh K. Lodha, "Glyphs for Visualizing Uncertainty in Vector Fields", *Transactions on Visualization and Computer Graphics*, Vol. 2, No. 3, September, 1996, pp. 266–279.

21. Alex Pang, "Spray Rendering", *IEEE Computer Graphics and Applications*, September 1994, pp. 57–63.

22. Boris Kogan, Walter Karplus, Brian Billett, Alex Pang, Hrayr Karagueuzian and Steven Khan, "The Simplified FitzHugh-Nagumo Model with Action Potential Duration Restitution: Effects on 2-D Wave Propagation", *Physica D*, vol. 50, no. 3, July 1991, pp. 327–340.

23. Boris Kogan, Walter J. Karplus and Alex Pang, "Simulation of Nonlinear Distributed Parameter Systems on the Connection Machine", *SCS Simulation*, vol. 55, no. 5, November, 1990, pp. 271–281.

24. Alex Pang, "Line Drawing Algorithms for Parallel Machines", *IEEE Computer Graphics and Applications*, September, 1990, pp. 54–59.

Conference Papers

1. Issei Mori, Akila de Silva, Gregory Dusek, James Davis, Alex Pang, "Flow-based Detection of Rip Currents" submitted to IEEE SciVis2020. Received Chancellor's Undergraduate Research Award, 2020.

2. Brad E. Hollister, Alex Pang, "Uncertainty Rank for Streamline Ensembles", Journal of Imaging Science and Technology, Volume 64, Number 1, January 2020. DOI: https://doi.org/10.2352/J.ImagingSci.Technol.2020

3. Shweta Philips and Alex Pang, "Detecting and Visualizing Rip Currents Using Optical Flow", EuroVis '16 Proceedings of the Eurographics / IEEE VGTC Conference on Visualization: Short Papers, pp. 19-23, URI: http://dx.doi.org/10.2312/eurovisshort.20161155. Groningen, The Netherlands, June 06-10, 2016.

4. Brad Eric Hollister, and Alex Pang "Visual Analysis of Transport Similarity in 2D CFD Ensembles", *Visualization and Data Analysis (VDA'16)*, pp. 1-11. 10.2352/ISSN.2470-1173.2016.1.VDA-508.

5. Georg H Albrecht and Alex Pang, "Interactive High-Dimensional Data Analysis Using the "Three Experts"", *Visualization and Data Analysis (VDA'15)*, pp. 1–10.

6. Georg H Albrecht, Hak Tae Lee, and Alex Pang, "Visual Analysis of Air Traffic Data Using Aircraft Density and Conflict Probability", AIAA-2012-2540, Garden Grove, California, June 19-21, 2012

7. Uliana Popov, Eddy Chandra, Katrin Heitmann, Salman Habib, James Ahrens, and Alex Pang, "Analyzing the Evolution of Large Scale Structures in the Universe with Velocity Based Methods", *PacificVis 2012*, pp. 49–56.

8. Nathaniel Cesario, Alex Pang, and Lisa Singh, "Visualizing Node Attribute Uncertainty in Graphs", *SPIE Proceedings on Visualization and Data Analysis* (VDA), volume 7868, pp. 78680H–78680H-13, 2011, San Francisco, CA.

9. Alisa G. Neeman, Rebecca Brannon, Boris Jeremić, Allen Van Gelder, and Alex Pang, "Decomposition and Visualization of Fourth Order Elastic-Plastic Tensors", in *Symposium on Volume Graphics*, August 10-11, 2008, Los Angeles CA.

10. Alex Pang, "Group Interactions in a Game Engine Class", in *Game Development in Computer Science Education* (GDCSE08), February 27-March 3, Miami Florida. Acceptance rate: 15/60.

11. James Skorupski, Zöe Wood, and Alex Pang, "Interactive Thin Shells – A Model Interface for the Analysis of Physically-based Animation", *ISCA 20th International Conference on Computer Applications in Industry and Engineering*, 2007, San Francisco, CA.

12. Jeffrey Sukharev, Xiaoqiang Zheng, Alex Pang "Tracing Parallel Vectors", *SPIE Proceedings on Visualization and Data Analysis* (VDA), Robert F. Erbacher, Jonathan C. Roberts, Matti T. Gröhn, Katy Börner, Editors, Volume 6060, 606011 (Jan. 16, 2006), pp. 350–359.

13. Alisa Neeman, Boris Jeremic, and Alex Pang, "Visualizing Tensor Fields in Geomechanics", in *IEEE Visualization* '05, pp. 35–42.

14. Xiaoqiang Zheng and Alex Pang, "Topological Structures of 3D Tensor Fields", in *IEEE Visualization* '05, pp. 551–558.

15. Xiaoqiang Zheng and Alex Pang, "2D Asymmetric Tensor Analysis", in *IEEE Visualization* '05, pp. 3–10.

16. Xiaohong Ye, David Kao, and Alex Pang, "Strategy for Seeding 3D Streamlines", in *IEEE Visualization* '05, pp. 471–478.

17. Wei Shen and Alex Pang, "Seeding Strategies for Hyperstreamlines", in *Proceedings of the Seventh IASTED International Conference on Computer Graphics and Imaging*, 2004.

18. Xiaoqiang Zheng and Alex Pang, "Topological Lines in 3D Tensor Fields", in *IEEE Visualization* '04, pp. 313–320.

19. David Kao, Marc Kramer, Alison Love, Jennifer Dungan and Alex Pang, "Visualizing Distributions from Multi-Return Lidar Data to Understand Forest Structure", *GeoInformatics*'04, 7-9 June 2004, Sweden, pp. 283–290.

20. Xiaoqiang Zheng and Alex Pang, "HyperLIC", in *IEEE Visualization* '03, pp. 249–256.

21. Doanna Weissgerber, Bruce Bridgeman and Alex Pang, "VisPad: A Novel Device for Vibrotactile Force Feedback", in *Haptics* 2004, pp. 50–57. Best Commercial Potential Nominee.

22. Doanna Weissgerber, Bruce Bridgeman and Alex Pang, "Feel the Information with VisPad: A Large Area Vibrotactile Device", *Information Visualization*, Spring 2004, Volume 3, Number 1, pp 36–48.

23. Alison Luo, David Kao and Alex Pang, "Visualizing Spatial Distribution Data Sets" *VisSym*'03, Joint Eurographics - IEEE TCVG Symposium on Visualization, May 2003, pp. 29–38, 238.

24. Zheng Xiaoqiang and Alex Pang, "Interaction of Light and Tensor Fields", *VisSym*'03, Joint Eurographics - IEEE TCVG Symposium on Visualization, May 2003, pp. 157–166, 295.

25. Alex Pang and Craig M. Wittenbrink, "Road Map and Issues in Collaborative Visualization", in *Modeling and Simulation: Theory and Practice*, a Memorial Volume for Professor Walter J. Karplus, edited by George Bekey and Boris Kogan, Kluwer Academic Publisher, 2003, pp. 249–268.

26. Wei Shen and Alex Pang, "Tuft Flow Visualization", *Proceedings of the Second IASTED International Conference on Visualization, Imaging, and Image Processing*, 2002, pp. 705–710.

27. Ahmed Amer, Alison Luo, Darrell Long, Alex Pang, "Visualizing cache effects on both physical and file system access", in *International Performance Computing and Communication Conference*, 2003.

28. Alison Luo, Ahmed Amer, Newton Der, Darrell D. E. Long, Alex Pang, "Visualizing Predictability of File Access Patterns", *Proceedings of the Fifth IASTED International Conference on Computer Graphics and Imaging*, 2002, pp. 233–238.

29. Zheng Xiaoqiang and Alex Pang, "Volume Deformation For Tensor Visualization", in *IEEE Visualization* '02, pp. 379–386.

30. David Kao, Alison Luo, Jennifer L. Dungan, and Alex Pang, "Visualizing Spatially Varying Distribution Data", *Proceedings of the 6th International Conference on Information Visualization*, 2002, IEEE Computer Society, pp. 219–225.

31. Jennifer L. Dungan, David Kao and Alex Pang, "The Uncertainty Visualization Problem in Remote Sensing Analysis", in *Proceedings of IEEE International Geoscience and Remote Sensing Symposium* '02, June 2002.

32. Alex Pang "Visualizing Uncertainty in Geo-spatial Data", in proceedings of the *Workshop on the Intersections between Geospatial Information and Information Technology*, prepared for the National Academies committee of the Computer Science and Telecommunications Board. Arlington, VA, October 1-2, 2001. www4.nas.edu/cpsma/cstb.nsf/files/wp-geo-pang.pdf/$file/wp-geo-pang.pdf

33. David Kao and Alex Pang, "Advecting Procedural Textures for 2D Flow Animation", in *Proceedings of Pacific Graphics* '01, October 16-18, 2001, pp. 355–362.

34. Bing Zhang and Alex Pang, "Stream Bubbles for Steady Flow Visualization", in *Proceedings of Pacific Graphics* '01, October 16-18, 2001, pp. 168–177.

35. Alison Luo, Ahmed Amer, Darrell D. E. Long, and Alex Pang, "Visualizing File System Predictability", in *IEEE Visualization* '01 Work in Progress.

36. Doanna Weissgerber and Alex Pang, "Feeling your Data: Passive Haptic Device", demonstration at *IEEE Visualization* '01.

37. David Kao, Jennifer Dungan, and Alex Pang, "Visualizing 2D Probability Distributions from EOS Satellite Image-Derived Data Sets: A Case Study", in *IEEE Visualization* '01, pp. 457–460.

38. David Kao, Bing Zhang, Kwansik Kim, and Alex Pang, "3D Flow Visualization Using Texture Advection", in *IASTED Computer Graphics and Imaging Proceedings*, August 13-16, 2001, pp. 252–257.

39. Alison Luo and Alex Pang, "A Variable Precision Hybrid Camera Calibration Method", in *IASTED Signal Processing, Pattern Recognition, and Applications proceedings*, July 3-6, 2001, pp. 270–275.

40. Suzana Djurcilov, Kwansik Kim, Pierre Lermusiaux, and Alex Pang, "Volume Rendering Data with Uncertainty Information", *Data Visualization* 2001, edited by D. Ebert, J. M. Favre, and R. Peikert, Springer, pp. 243–252, 355–356.

41. Kwansik Kim, Craig Wittenbrink, and Alex Pang, "Data Level Comparisons of Surface Classifications and Gradient Filters", *International Workshop on Volume Graphics*, 2001, Stony Brook New York, June 21-22, pages 13–22.

42. David Kao and Alex Pang, "On Animating 2D Velocity Fields", *SPIE Proceedings on Visual Data Exploration and Analysis 2001*, Volume number 4302, pp. 41–48.

43. Laixin Zhou and Alex Pang, "Metrics and Visualization Tools for Surface Mesh Comparison", *SPIE Proceedings on Visual Data Exploration and Analysis 2001*, Volume number 4302, pp. 99–110.

44. Alex Pang, "Comparative Visualization for Verification", *European Simulation Multiconference 2000*, May 2000, Ghent, Belgium, pp. 161–163.

45. Vivek Verma, David Kao, and Alex Pang, "Flow-Guided Streamline Seeding Strategy", *Visualization '00*, pp. 163–170, 552.

46. Alex Pang, "Interactive Cartography", *International Geoscience and Remote Sensing Symposium 2000*, IEEE order number: 0-7803-6362, July, 2000.

47. Marc Hansen, Suresh Lodha, and Alex Pang, "ProFeel: Low Cost Visual-Haptic Perceptualization of Protein Structure-structure Alignments", *Proceedings of the Pacific Symposium on Biocomputing*, Volume 5, pp. 218–229, January 2000.

48. Abigail J. Joseph, Suresh K. Lodha, Jose C. Renteria, and Alex Pang, "UISURF: Visualizing Uncertainty in Isosurfaces", *Proceedings of Computer Graphics and Imaging*, pp. 184–191, October, 1999.

49. Suzana Djurcilov and Alex Pang, "Visualizing Gridded Datasets with Large Number of Missing Values", *IEEE Visualization '99*, pp. 405–408, 551. Won Best Case Study award.

50. Vivek Verma, David Kao, and Alex Pang, "PLIC: Bridging the Gap Between Streamlines and LIC", *IEEE Visualization '99*, pp. 341–348, 541.

51. Kwansik Kim and Alex Pang, "Ray-based Data Level Comparisons of Direct Volume Rendering Algorithms", *Scientific Visualization*, Dagstuhl'97, edited by Hans Hagen, Gregory Nielson, and Frits Post, IEEE Computer Society, 1999, pp. 145–158.

52. Kwansik Kim and Alex Pang, "A Methodology for Comparing Direct Volume Rendering Algorithms Using a Projection-Based Data Level Approach", in *Eurographics/IEEE TCVG Symposium on Visualization*, May 1999, Vienna, Austria, pp. 87–98.

53. Marc Hansen, Eric Charp, Suresh Lodha, Doanna Meads, and Alex Pang, "PROMUSE: A Prototype System for Multi-Media Visualization of Protein Structural Alignments", in *Pacific Symposium on BioComputing* '99, edited by R. Altman et al., pp. 367–379.

54. Doanna Meads, Marc Hansen, and Alex Pang, "ProtAlign: A 3-Dimensional Protein Alignment Assessment Tool", in *Pacific Symposium on BioComputing* '99, edited by R. Altman et al., pp. 354–367.

55. Marc Hansen, Doanna Meads, and Alex Pang, "Comparative Visualization of Protein Structure-Sequence Alignments", *Information Visualization'98*, pp. 106–110.

56. Alex Pang "REINAS as a Research Platform for Visualization", accepted to *GIS Planet'98*.

57. Chang Sung Jeong and Alex Pang, "Reconfigurable Disc Trees for Visualizing Large Hierarchical Information Space", *Information Visualization'98*, pp. 100–104.

58. Ed Boring and Alex Pang, "Interactive Deformations from Tensor Fields", *IEEE Visualization'98*, pp. 297–304, 545.

59. Qin Shen, Alex Pang, and Sam Uselton, "Data Level Comparison of Wind Tunnel and Computational Fluid Dynamics Data", *IEEE Visualization'98* Case Studies, pp. 415–418, 557.

60. Jeffrey Brainerd and Alex Pang, "Floating Ring: A New Tool for Visualizing Distortion in Map Projections", *Proceedings Computer Graphics International '98*, Hannover, Germany, June 22-26, 1998. Edited by: F.-E. Wolter and N.M. Patrikalakis, IEEE Computer Society, pp. 466–480.

61. Wendell Nuss, Darrell Long, Patrick Mantey, Alex Pang, and Eric Rosen, "The Real-Time Environmental Information Network and Analysis System (REINAS)", *Naval Research Reviews*, volume L, 1998, pp. 24–30.

62. Suzana Djurcilov and Alex Pang, "Visualization Products On-Demand Through the Web", *VRML'98 Proceedings*, ACM, 1998, pp. 7–13.

63. Elijah Saxon, Zoe Wood, Michael O'Neil, Chris Oates, Jeremy Story, Suzana Djurcilov, and Alex Pang, "Integrated Visualization of Realtime Environmental Data", *Proceedings of the Spring Conference on Computer Graphics*, June 5-8, 1997, Bratislava, Slovakia, Comenius University, 1997, pp. 135–143.

64. Alex Pang, "Visualization Lies You Never Knew (and How to Detect Them)", position paper accepted to the *International Cartographic Association, Commission on Visualization*, June 1997, Sweden.

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Invited Papers

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2. Chris Johnson and Alex Pang, "Special Issue: Working with Uncertainty Workshop: Representation, Quantification, Propagation, Visualization, and Communication", *International Journal for Uncertainty Quantification* Volume 3, Number 3, 2013.

3. Chris Johnson and Alex Pang, "Special Issue: Working with Uncertainty Workshop: Representation, Quantification, Propagation, Visualization, and Communication", *International Journal for Uncertainty Quantification* Volume 3, Number 2, 2013.

4. Min Chen, Charles Hansen and Alex Pang, "Editorial for IEEE Visualization 2007 Conference Proceeding", special issue of *IEEE Transactions on Visualization and Graphics*, October 2007.

5. Edi Groeller, Claudio Silva and Alex Pang, "Editorial for IEEE Visualization 2006 Conference Proceeding", special issue of *IEEE Transactions on Visualization and Graphics*, October 2006.

6. Alex Pang, "Visualizing Uncertainty in Natural Hazards", commissioned by Mid-America Earthquake Center and funded by NSF. July 14-15, 2006.

7. Alex Pang and Hans-Georg Pagendarm, "Visualization for Everyone". Guest editors' introduction to special issue on Visualization case studies. *IEEE Computer Graphics and Applications*, Vol. 18, No. 4, July-August, 1998, pp. 47–48.

8. Alex Pang and Dan Fernandez, "REINAS Instrumentation and Visualization", *Proceedings of Oceans'95*, San Diego, California, October 1995, pp. 1892–1899.

9. Alex Pang and Craig Wittenbrink, "Spray Rendering as a Modular Visualization Environment", *Computer Graphics*, Vol. 29, No. 2, FOCUS: Modular Visualization Environments, Past, Present, and Future, edited by Gordon Cameron, 1995, pp. 33–36.

Technical Reports

1. Aishna Agrawal, Aakash Thakkar, and Alex Pang, "GeoAR Android App And Backend POI Helper", UCSC-SOE-18-03, 2018.

2. Brad Eric Hollister and Alex Pang, "Interpolation of Non-Gaussian Probability Distributions for Ensemble Visualization", UCSC-SOE-13-13, 2013.

3. Georg Albrecht, Hak Tae Lee, Bassam Mussafar, and Alex Pang, "Visual Analysis of Air Traffic Data", UCSC-SOE-11-24, 2011.

4. Katarina Yang, Nathaniel Cesario, and Alex Pang, "Automatic Transitional Animation Between Visualizations", UCSC-SOE-11-23, 2011.

5. Uliana Popov, Katrin Heitmann, James Ahrens, Salman Habib, and Alex Pang, "The Evolution of Multistreaming Events in the Formation of Large Scale Structures", UCSC-SOE-11-17, 2011.

6. Uliana Popov, Eddy Chandra, Katrin Heitmann, Salman Habib, James Ahrens, and Alex Pang, "Velocity Based Feature Extraction of Multistreaming Events in Cosmological Simulations", UCSC-SOE-11-16, 2011.

7. Eddy Chandra, Katrin Heitmann, James Ahrens, Salman Habib, and Alex Pang, "Exploring Multistreaming in the Universe", UCSC-SOE-09-37, 2009.

8. Robert Hero and Alex Pang, "Hardware Accelerated HyperLIC", UCSC-SOE-08-21, 2007.

9. Newton Der and Alex Pang, "Direct Volume Rendering of Multi-Valued Data Sets", UCSC-SOE-08-20, 2006.

10. David Kao, Alison Luo, Jennifer L. Dungan, and Alex Pang, "Beyond Box Plots for 2D Distribution Data Sets", UCSC-CRL-02-21, 2002.

11. David Kao and Alex Pang, "On Animating 2D Vector Fields", NAS-00-012, NASA Ames Research Center, Moffett Field, CA, June 2000.

12. Bing Zhang and Alex Pang, "NURBS Blobs for Flow Visualization", UCSC-CRL-00-18, 2000.

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14. Kwansik Kim and Alex Pang, "Projection Based Data Level Comparative Visualization of Direct Volume Rendering Algorithms", UCSC-CRL-97-16, 1997.

15. Kwansik Kim and Alex Pang, "Ray Based Data Level Comparative Visualization of Direct Volume Rendering Algorithms", UCSC-CRL-97-15, 1997.

16. Craig M. Wittenbrink, Kwansik Kim, and Alex T. Pang, "Data Dependent Optimizations for Permutation Volume Rendering", UCSC-CRL-96-24, 1996.

17. Alex Pang, Craig Wittenbrink, and Suresh Lodha, "Approaches to Uncertainty Visualization", UCSC-CRL-96-21, 1996.

18. Craig Wittenbrink, Alex Pang, and Suresh Lodha, "Verity Visualization: Visual Mappings", UCSC-CRL-95-48, 1995.

19. P.E. Mantey, D.D.E. Long, J.J. Garcia-Luna, A.T. Pang, H.G. Kolsky, B.R. Gritton, W.A. Nuss, "REINAS: Real-Time Environmental Information Network and Analysis System: Phase IV - Experimentation", UCSC-CRL-94-43, 1994.

20. P.E. Mantey, D.D.E. Long, J.J. Garcia-Luna, A.T. Pang, H.G. Kolsky (UCSC), B.R. Gritton (MBARI), W.A. Nuss (NPS), "REINAS: Real-Time Environmental Information Network and Analysis System: Phase III - Systems Design", UCSC-CRL-94-08, March 10, 1994.

21. P.E. Mantey, J.J. Garcia-Luna, H.G. Kolsky, D.D.E. Long, A.T. Pang, E.C. Rosen, C. Tang, B.R. Montague, M.D. Abram, W.W. Macy, B.R. Gritton, J. Paduan, and W. Nuss. "REINAS: Real-Time Environmental Information Network and Analysis System: Phase II Requirements Definition", UCSC-CRL-93-34, July 1993.

22. Darrell D.E. Long, Patrick E. Mantey, Alex T. Pang, Glen G. Langdon, Jr., Robert A. Levinson, Harwood G. Kolsky and Bruce R. Gritton. "REINAS: Real-Time Environmental Information Network and Analysis System: Concept Statement", UCSC-CRL-93-05, January 1993.

23. Alex Pang and Kyle Smith. "Spray Rendering: A New Framework for Visualization", University of California, Santa Cruz Technical Report UCSC-CRL-93-01, January 1993.

24. Boris Kogan, Walter J. Karplus and Alex Pang, "Simulation of Nonlinear Distributed Parameter Systems on the Connection Machine", UCLA Computer Science Department, TR-890026, June 1989.

Chapters in Book

1. Alex Pang, "Visualizing Uncertainty in Natural Hazards", in *Risk Assessment, Modeling and Decision Support: Strategic Directions Series: Risk, Governance and Society*, Vol. 14, edited by Ann Bostrom, Steven P. French, and Sara J. Gottlieb, Springer, 2008, XIV, Chapter 12, pp. 261–294. ISBN: 978-3-540-71157-5.

2. Xavier Tricoche, Xiaoqiang Zheng, and Alex Pang, "Visualizing the Topology of Symmetric, Second-Order, Time-Varying Two-Dimensional Tensor Fields", in *Visualization and Processing of Tensor Fields Series: Mathematics and Visualization*, edited by J. Weickert and H. Hagen, Springer, 2006, XV, Chapter 13, pp. 225–240.

3. Xiaoqiang Zheng, Xavier Tricoche, and Alex Pang, "Degenerate 3D Tensors", in *Visualization and Processing of Tensor Fields Series: Mathematics and Visualization*, edited by J. Weickert and H. Hagen (Eds.), Springer, 2006, XV, Chapter 14, pp. 241–256.

4. Alex Pang, "A Syllabus for Scientific Visualization", in *Scientific Visualization in Mathematics and Science Teachings*, edited by David A. Thomas, AACE, 1995, pp. 261–283.

Abstracts, Posters, and Graphics

1. Gregory Dusek, Michael Churma, Jung-Sun Im, Ra'Teema Etienne, Alex Pang, Akila de Silva, and Issei Mori, "Innovative Approaches for Rip Current Detection Improves Modelling Capabilities and Supports Public Safety", AGU Ocean Sciences, San Diego, CA, Feb. 16-21, 2020.

2. Fan Hong, Xiaoru Yuan, Alex Pang, Chufan Lai, Brad Hollister, Xiaoguang Ma, Pierre Lermusiaux, "Decoupling Ensemble Data Using Subspaces", PacificVis, Feb. 2017.

3. Gbolahan Adesoye and Alex Pang, "Extensible Augmented Reality for Human Internal Body Parts", UCSC Graduate Research Symposium, 2016.

4. Jacob Cohen, Adam Black, Paul Han, and Alex Pang, "Some Experiences with Conveying Diagnostic Test Accuracy", Gordon Research Conference, Aug 2-7, 2015.

5. Matthew Jee, Brad Hollister, and Alex Pang, "Probabilistic Rendering of Trajectories", Undergraduate Research Poster Symposium, 2014.

6. Brad Hollister and Alex Pang, "Interpolation of Non-Gaussian Probability Distributions for Ensemble Visualization", IEEE Visualization, 2013.

7. Lise Getoor, Alex Pang, and Lisa Singh, "Uncertainty in Graphs: Foundations and Comparative Analytics", Foundations of Data and Visual Analytics, 2010.

8. Nathaniel Cesario, Lise Getoor, Lisa Singh and Alex Pang, "Visual Graph Comparisons with Bullseyes", IEEE Information Visualization '09.

9. Nick Green and Alex Pang, "Game Engines for Visualization", IEEE Visualization '09.

10. "A Tensor Decomposition Method for Visualization of Destabilizing Geomechanics Solids", Alisa Neeman, Rebecca Brannon, Boris Jeremiıc, Allen Van Gelder, and Alex Pang, 4th Annual Graduate Research Symposium, UCSC, May 2008.

11. Alisa Neeman, Boris Jeremiıc, and Alex Pang, "On Time Visualization of Simulations in OpenSees with VEES", Fifth NEES Annual Meeting, June 19-21, 2007, Snowbird Utah.

12. "Displaying Properties of PDFs", David Kao, Jennifer Dungan, and Alex Pang, in (NASA) Software Tech Briefs, September 2007 page 21.

13. Adam Markowitz, Alisa Neeman, Boris Jeremic, and Alex Pang, "ODEn: OpenSees Design Environment", Proceedings of the Fourth NEES Annual Meeting, June 21-23, 2006, Arlington, VA.

14. Alisa Neeman, Boris Jeremic, Adam Markowitz, and Alex Pang, "VEES: An XML-Driven Visualization and Development Environment", Proceedings of the Fourth NEES Annual Meeting, June 21-23, 2006, Arlington, VA.

15. "Picturing Data With Uncertainty", David Kao, Alison Love, Jennifer L. Dungan, and Alex Pang, Siggraph 2004 Poster.

16. Image from Interactive Map Projection software in "Thematic Cartography and Geographic Visualization" by Terry Slocum to be published by Prentice Hall, 2004.

17. "Modifying animation attributes", HPCwire cover image for the April 18, 2003 issue on Biological Pathway Mapping by Nature Language Processing.

18. David Kao, Jennifer Dungan, Alison Luo and Alex Pang "Visualization of 2D Distributions from Models with Uncertainty", American Geophysical Union, Fall Meeting 2002, December 2002, B61A-0704.

19. Alex D'Angelo and Alex Pang, "Flow Visualization Using Fur Simulation", Undergraduate Research Poster Symposium, 2002, www.cse.ucsc.edu/research/avis/fur.html.

20. Alison Luo, Ahmed Amer, Newton Der, Darrell D. E. Long, Alex Pang, "Visualizing I/O Predictability", in 3D Data Processing, Visualization, and Transmission. Poster presentation, June 19-21, 2002.

21. "Visualizing Uncertainty in Earth Observing System Satellite Data", article in *Gridpoints*, Summer 2002, pp. 6-9 which featured some work on visualizing 2D distribution data sets.

22. "The Picture of Uncertainty", article in *Computer Graphics World*, volume 22, number 11, November 1999, by Diana Phillips Mahoney, pp. 44-50 which featured some of uncertainty visualization work at UCSC.

23. Ed Boring and Alex Pang, "Tensor Visualization", *SIGGRAPH 99*, Technical Slide Set.

24. Vivek Verma and Alex Pang, "Ribbon Comparison", *SIGGRAPH 99*, Technical Slide Set.

25. "California Coastline Data and Analysis Accessible on the Web", article in *Envision*, Vol. 14, No. 3, July-September, 1998, pp. 2–3 which featured REINAS contributions to NPACI.

26. "Research Experience for Undergraduates at UC", article in *NSF at UC*, Spring 1998, which featured visualization work where undergraduates were involved with at UCSC.

27. Alex Pang and Ed Boring, "Flow Reversal in Delta Wing", Back Cover, *IEEE Visualization 1996 Conference Proceedings*, 1996.

28. Boris Y. Kogan, Hrayr S. Karagueuzian, Walter J. Karplus, Brian S. Billet, William J. Mandel, Alex T. Pang, Steven S. Khan, "The Role of the Residual Outward Current Kinetics in the Induction of Reentry without Anatomical Obstacle", *Pacing and Clinical Electrophysiology, Part II*, vol. 14, no. 4, April 1991, page 653.

29. Boris Y. Kogan, Hrayr S. Karagueuzian, Walter J. Karplus, Steven S. Khan, Brian S. Billett, Alex T. Pang, William G. Stevenson, "Unidirectional Conduction Block Caused by Variations in Pathway Geometry: A New Mechanism for Reentry", *JACC*, Vol. 17, No. 2, page 386A, February, 1991.

30. Alex Pang, "cAMP Landscape of Slime Molds", *SIGGRAPH 90*, Technical Slide Set, Computer Graphics, January 1991, vol. 25, no. 1, page 7.

31. Hrayr S. Karagueuzian, Steven S. Khan, Boris Y. Kogan, Walter J. Karplus, Alex T. Pang and Brian Billett, "Reentry Induced by Increased Slope of Action Potential Restitution Curve. A Computer Simulation Study", *Circulation*, supplement III, October 1990, vol. 82, no. 4, pp. 644.

32. Alex Pang and Yu-Ming Azzawi, "About the Cover", *IEEE Computer Graphics and Applications*, December 1985.

Web Pages

Due to changes in SOE web services and shut down of the /cse/classes directory over the summer of 2018 amidst FERPA concerns, some of the links below may not be working anymore.

1. "Advanced Visualization and Interactive Systems Lab", http://www.cse.ucsc.edu/research/avis. Contents are mostly recovered in https://avis.soe.ucsc.edu/.

2. "Santa Cruz Laboratory for Visualization and Graphics", http://www.cse.ucsc.edu/research/slvg, with Suresh Lodha, Allen van Gelder, and Jane Wilhelms.

3. Course Class web pages:
   http://www.cse.ucsc.edu/~ pang/12a
   http://www.cse.ucsc.edu/~ pang/30
   http://www.cse.ucsc.edu/~ pang/60g
   http://www.cse.ucsc.edu/~ pang/80v
   http://www.cse.ucsc.edu/~ pang/94f
   http://www.soe.ucsc.edu/~ pang/160
   http://www.soe.ucsc.edu/~ pang/161
   http://www.cse.ucsc.edu/~ pang/162
   http://www.cse.ucsc.edu/~ pang/164
   http://www.soe.ucsc.edu/~ pang/200
   http://www.cse.ucsc.edu/~ pang/260
   http://www.soe.ucsc.edu/~ pang/261
   http://www.cse.ucsc.edu/~ pang/262
   http://www.cse.ucsc.edu/~ pang/293.

Dissertation

Pang, Alex T. June 1990. "A Methodology for Simulating Distributed Parameter Systems Using Massive Parallelism", Ph.D. Dissertation, University of California at Los Angeles.

Thesis

Pang, Alex T. September 1984. "A Motion Analysis and Prediction of Sequential Geosynchronous Satellite Pictures in the Infrared Channel", Master's Thesis, University of California at Los Angeles.

PROFESSIONAL ACTIVITIES

Presentations

2018 "Remote Sensing of Rip Currents" presented at the NSF visioning workshop on Integrating Science Needs with Advanced Seafloor Sensor Engineering to Provide Early Warning of Geohazards, on July 12-13, 2018 in Lincoln City, OR.

2016 "Visualization for the Masses, Redux" presented as a keynote at the Visualization and Data Analysis (VDA'16) conference on Feb 16, 2016 in San Francisco, CA.

2014 "Research Issues in Uncertainty Visualization", presented at the Computing Community Consortium sponsored workshop on Uncertainty in Computing, held in Washington DC on October 15-16, 2014.

2014 "Problems and Research in Uncertainty Visualization", presented at the Ensemble Visualization and Parameter Space Analysis Workshop, held at the Technische Universitt Mnchen on March 23-24, 2014.

2012 "Uncertainty Visualization: Techniques, Challenges and Directions", presented at the IEEE Visualization Tutorial Session held at Seattle on October 15, 2012.

2012 "Extracting and Tracking Cosmological Features", presented at the Electrical Engineering and Computer Science Technical Seminar Series held at UC Merced, on May 4, 2012.

2011 "Advanced Visualization and Interactive Systems", presented at the OpenLab Summer Visualization Workshop held at UCSC, on July 12-21, 2011.

2010 "Foundations of Comparative Analytics for Uncertainty in Graphs", presented at the NSF Fodava Meeting held at the Georgia Institute of Technology, on December 8-10, 2010.

2009 "Uncertainty Visualization", presented at the Visualization Summer School held at the Peking University, on August 3-7, 2009.

2009 "Tensor Field Visualization", presented at the Visualization Summer School held at the Peking University, on August 3-7, 2009.

2009 "Exploring Multi-streaming in the Universe", presented at the ISSDM Annual Research Symposium, on October 20, 2009.

2009 "Challenges of Uncertainty Visualization", invited talk presented at the Gordon Research Conference held at the Magdalen College in Oxford, UK, on July 26-31, 2009.

2008 "Uncertainty from Ensemble Data Sets", presented at Los Alamos National Lab on May 14, 2008.

2008 Alex Pang, "Visualizing Ensemble Data Sets", presented at the Berliner Colloquium fur Wissenschaftliche Visualisierung, Zuse Institute Berlin, on March 10, 2008.

2008 Alex Pang, "Group Interactions in a Game Engine Class", presented at the Game Development in Computer Science Education 2008, aboard the Celebrity Century on February 27 - March 3, 2008.

2007 "Uncertainty Visualization of Ensemble Data Sets", presented at Los Alamos National Lab on November 29, 2007.

2007 "Representing and Visualizing Uncertainty", keynote speech delivered at the IADIS International Conference on Computer Graphics and Visualization, in Lisbon, Portugal on 5-7 July, 2007.

2006 "Visualizing Seismic Risk and Uncertainty to Meet User Needs", presented at the Workshop on Strategic Directions for Seismic Risk Modeling and Decision Support, held in Boulder Colorado on July 14-15, 2006.

2006 "Visualization in Geomechanics, Environmental Sciences, and Medicine", presented at the CITRIS-Asia meeting in Tokyo, Japan on April 10, 2006.

2005 "Strategy for Seeding 3D Streamlines", presented at the IEEE Visualization conference in Minnesota, Minneapolis on October 27, 2005.

"Cumulative Deformation Tensors", presented at the TopoInVis workshop in Budmerice, Bratislava on September 28, 2005.

"Visualizing Uncertainty: Computer Science Perspective", presented at the National Academy of Sciences in Washington, DC on March 3-4, 2005 with Ben Schneiderman. www7.nationalacademies.org/bms/visualization_agenda.html

2004 "Deformation Tensor Visualization", presented at the University of Kaiserslautern, Germany on April 23, 2004.

"Degenerate 3D Tensors", presented at the Dagstuhl Perspective Workshop on Visualization and Image Processing of Tensor Fields, held at Dagstuhl, Germany on April 18-23, 2004.

"Deformation-Based Tensor Field Visualization", invited talk presented at the Visualization and Data Analysis conference held on January 19-20, 2004 in San Jose, California.

2003 "Visualizing Multidimensional Multivalue Data Sets", presented at the AHPCRC Workshop on Graphics Modeling, Simulation and Visualization in Tallahassee, Florida on June 23-24, 2003.

"Interaction of Light and Tensor Fields", presented at the VisSym'03 conference in Grenoble, France on May 26-28, 2003.

"Visualizing Uncertainty: Focus on Geo-spatial Data", presented at the Citris Foundation Members Meeting at UC Davis on February 27, 2003.

"Strategies for Visualizing 2D Distribution Data", presented at the SIAM conference in San Diego on February 10-13, 2003.

2002 "Tuft Flow Visualization", presented at the Visualization, Imaging and Image Processing 2002 conference in Marbella, Spain on September 9-12, 2002.

"Beyond Box Plots", presented at University of Alberta, Edmonton on July 2, 2002.

"Uncertainty and Comparative Visualization", presented at the Life Sciences and Information Technology meeting on April 27, 2002, and NASA Ames on May 8, 2002.

2001 "Comparative and Uncertainty Visualization for Sensitivity Analysis", presented at Sandia National Laboratory on November 12, 2001.

"Advecting Procedural Textures for 2D Flow Animation", presented at the Pacific Graphics 2001 conference in Tokyo, Japan on October 16-18, 2001.

"Stream Bubbles for Steady Flow Visualization", presented at the Pacific Graphics 2001 conference in Tokyo, Japan on October 16-18, 2001.

"Visualizing Uncertainty in Geo-spatial Data" presented at the National Academies (Computer Science and Telecommunications Board of the National Research Council) Workshop on Intersections between Geospatial Information and Information Technology on October 1-2, 2001.

"Some Comparative and Uncertainty Visualization Techniques for Sensitivity Analysis" presented at the Sensitivity Analysis workshop at Lawrence Livermore National Laboratories on August 16-17, 2001.

"A Variable Precision Hybrid Camera Calibration Method", presented at the IASTED Signal Processing, Pattern Recognition, and Applications conference in Rhodos, Greece on July 3-6, 2001.

2000 "Possible Ways of Visualizing Uncertainty" presented at the ONR Experts Panel on Capturing, Transferring, and Visualizing Uncertainty on October 16-17, 2000.

"Simple Statistical Visualization of Ocean Modeling Data" presented at Woods Hole Oceanographics Institute for ONR/DRI workshop on August 22, 2000.

"Quantifying and Visualizing Uncertainty in Large Scientific Data Sets" pesented at Sandia Livermore for ASCI 2 meeting on May 16, 2000.

"Uncertainty Visualization" presented at ONR on March 24, 2000.

"Visualizing Large Seismic Data Sets" presented at UCSC for Sun Microsystems on March 22, 2000.

"Comparative Visualization Techniques" presented at the Hewlett Packard Laboratories on February 11, 2000.

1999 "How Much Should You Trust Your Visualization", presented at the Sandia National Laboratories and Los Alamos Nationality Laboratories on December 9-10.

"Towards Understanding Uncertainty in Terascale Visualization", presented at the NSF/DOE Workshop on Large Data Visualization in Salt Lake City, Utah on May 19-22.

"Quantifying and Visualizing Uncertainty in Large Scientific Data Sets", presented at the DOE Data Visualization Corridor meeting in Pasadena, California on March 4-5.

1998 "Visualizing Uncertainty in Models of Complex Phenomena", presented at the LANL Center for Nonlinear Science workshop on Predictability held in Los Alamos, New Mexico on May 11-12.

"Collaborative Visualization" presented at the NSF/NPACI Interactive Environments thrust meeting held in San Diego, California on February 11-12.

1997 "Nomadic Collaborative Visualization with Imprecise Information", presented at the Darpa PI Meeting in San Diego, California on October 15-17.

"Data Level Comparative Visualization of Direct Volume Rendering Algorithms", presented at the Dagstuhl Workshop on Scientific Visualization in Dagstuhl, Germany on June 11.

"Integrated Visualization of Realtime Environmental Data", presented at the Spring Conference on Computer Graphics in Bratislava, Slovakia on June 7.

"REINAS System and Visualization", presented at the Stennis Space Center for CNMOC and NAVO on March 26-28.

1996 "Environmental Visualization", presented at the Hewlett Packard Research Laboratories in Palo Alto, California on December 6.

"Methods for Revealing Lies in Visualization", presented at the VizLies session of the Visualization'96 conference in San Francisco, California on October 29.

"Methods for Comparing 3D Surface Attributes", presented at the UC Davis Department of Applied Science colloquium series on January 23.

"Integrated 3D Volume Physics and Rendering", presented at the ONR workshop on Volume Visualization in Tempe, Arizona from February 14-16.

"Environmental Visualization", presented at the Monterey Bay National Marine Sanctuary Symposium on March 9 with Wendell Nuss.

1995 "REINAS/Visualization", presented at the San Jose State University Computer Science Department Seminar in San Jose, California on April 3.

"Uncertainty Visualization", presented at the VizLies session of the Visualization'95 conference in Atlanta, Georgia on October 31.

1994 "Cspray: collaborative scientific visualization", live demo at the Visualization'94 conference in Washington D.C, in conjunction with Multimedia'94 in San Francisco and UCSC. Presenters include Craig Wittenbrink, Tom Goodman, Elijah Saxon and Jeff Furman.

1993 "Spray Rendering", presented at the Navy Scientific Visualization Reality Seminar in Bethesda, Maryland. Also presented at the USGS Visualization Workshop in Menlo Park, CA.

1992 "Challenges in Remote Interactive Steering", presented in the Computer Science Seminars at the University of Hong Kong on April 9.

1991 "Cardiac Model based on FitzHugh-Nagumo with Restitution Properties", presented at the Research Institute of the Palo Alto Medical Foundation in Palo Alto on March 12.

"Simulation and Visualization of Heart Muscles on the Connection Machine", presented as a RIACS/NAS Seminar at NASA Ames Research Center on August 13.

1990 "Self-Organizing Structures in Dictyostelium Discoideum", presented at the second Artificial Life Conference held in Santa Fe, New Mexico from Feb. 5-9.

1989 "Solving Nonlinear PDE's in a Parallel Fashion", 5th Annual University of California Conference on Nonlinear Science, held at UCSD in March.

Activities in Professional Associations

International Program Committee, VDA, 2021
Program Committee, International Symposium on Visual Computing, 2020
Reviewer, EuroVis, 2020
Program Committee, IEEE SciVis, 2020
Reviewer, Journal of Visualization, 2020
International Program Committee, VDA, 2020
IEEE Visualization Test of Time Selection Committee, 2019
Reviewer, Journal of Imaging Science and Technology, 2019
Program Committee, IEEE SciVis, 2019
International Program Committee, VDA, 2019
Panelist, VGP Best Dissertation Committee, 2018
Reviewer, ACM Computing Surveys, 2018
Reviewer, Computers and Graphics, 2018
International Reviewer, Swiss National Science Foundation 2018
Reviewer, Mathematical and Computational Applications, 2018
Program Committee, IEEE SciVis, 2018
Reviewer, The Visual Computer, 2018
International Program Committee, PacificVis, 2018
Reviewer, The Visual Computer, 2017
Reviewer, IEEE TVCG, 2017
International Program Committee, PacificVis, 2017
Reviewer, IEEE SciVis, 2016
Program Committee, ChinaVis, 2016
International Program Committee, PacificVis, 2016
Reviewer, Journal of Visualization, 2015

Program Committee, ChinaVis, 2015
Reviewer, The Visual Computer, 2015
Reviewer, IEEE Transactions on Visualization and Computer Graphics, 2015
International Program Committee, Eurovis 2015
Reviewer, The Computer Journal 2014
Reviewer, Computer Graphics Forum 2014
Reviewer, IEEE Visualization Tutorials, 2014
Reviewer, Journal of Experimental Psychology: Applied, 2014
Reviewer, Cartography and Geographic Information Science, 2014
Reviewer, The Visual Computer, 2014
Program Committee, SciVis 2014
Reviewer, Journal of Visual Languages and Computing, 2014
Reviewer, Big Ideas, 2013
International Program Committee, EuroVis 2014
Reviewer, IEEE Computer Graphics & Applications 2013
Reviewer, Pacific Visualization 2013
Reviewer, Chile National Commission for Scientific and Technological Research, 2013
International Program Committee, International Conference on Information Visualization Theory and Applications (IVAPP 2014)
Reviewer, IEEE TVCG 2013
International Program Committee, IEEE Vis 2013
Reviewer, Netherlands Organisation for Scientific Research, 2013
International Program Committee, EuroVis 2013
International Program Committee, International Conference on Information Visualization Theory and Applications (IVAPP 2013)
Guest Editor, Internation Journal for Uncertainty Quantification, Special Issue on Uncertainty Visualization, 2012
Reviewer, IEEE Visualization 2012
Reviewer, Human-centric Computing and Information Sciences 2012
Reviewer, International Journal of Computer Mathematics 2012
Reviewer, IEEE TVCG 2012
Reviewer, Netherlands Organisation for Scientific Research, 2012
Reviewer, Austrian Science Fund, START Program 2012 (NSF equivalent of Austria)
Reviewer, International Program Committee of Eurographics 2012
Reviewer, International Journal of Computer Mathematics 2011
International Program Committee, International Conference on Information Visualization Theory and Applications (IVAPP 2012)
Organizer, Workshop on Analysis and Visual Exploration of Cosmology (with Bruno Sanso), held in conjunction with the 3rd Annual SRL/ISSDM Research Symposium 2011
Organizer, Working with Uncertainty Workshop (with Chris Johnson), held in conjunction with IEEE Visualization 2011
Reviewer, IEEE TVCG 2011
Reviewer, NSF 2011
Associate Editor, Human-centric Computing and Information Sciences, Springer 2011
International Program Committee, IEEE Visualization 2011
Reviewer, EuroVis 2011
Reviewer, TopoInVis 2011
Reviewer, ACM SIGCHI 2011
International Program Committee, International Conference on Information Visualization Theory and Applications (IVAPP 2011)
Reviewer, Computer Graphics Forum 2010
Reviewer, Information Visualization 2010
Reviewer, NSF Panel 2010 (two times)
Reviewer, IEEE TVCG 2010

Reviewer, Computational Statistics 2010
International Program Committee, International Symposium on Visual Computing (ISVC10)
Reviewer, Computers and Geoscience, 2010
International Program Committee, EuroVis 2010
International Program Committee, Pacific Visualization 2010
External Reviewer, British Columbia Innovation Council 2009
Reviewer, DOE Proposals 2009
International Reviewer, Singapore Ministry of Education 2009
International Reviewer, Swiss National Science Foundation 2009
International Program Committee, IEEE Visualization 2009
Reviewer, IEEE TVCG 2009
Reviewer, Computational Statistics 2009
International Program Committee, EuroVis 2009
Program Committee, Visualization and Data Analysis 2009
International Program Committee, Pacific Visualization 2009
Reviewer, Swiss National Science Foundation 2008
Reviewer, Computer Graphics Forum 2008
Reviewer, IEEE TVCG 2008
Reviewer, Computers & Geosciences 2008
Reviewer, Pacific Visualization 2008
Reviewer, IEEE Visualization 2008
Reviewer, IEEE Computer Graphics & Applications 2008
External Reviewer, Hong Kong Research Grants Council 2008
International Program Committee, EuroVis'08
Reviewer, Information Visualization Journal 2008
2008 IEEE Pacific Visualization Symposium, Program Committee
IEEE Transaction on Visualization and Computer Graphics, Guest Editor 2007
Paper Co-Chair, IEEE Visualization '07
Program Committee, EuroVis'07
IEEE Transaction on Visualization and Computer Graphics, Guest Editor 2006
Paper Co-Chair, IEEE Visualization '06
Program Committee, EuroVis'06
Reviewer, IEEE TVCG 2006
Reviewer, Informatica, Internation Journal of Computing and Informatics
International Program Committee, Topology-Based Methods in Visualization 2005
Program Committee, Visualization'05
Program Committee, Toward Improved Visualization of Uncertain Information, National Academy of Sciences, 2005
Program Committee, Coordinated & Multiple Views in Exploratory Visualization (CMV2005)
Reviewer, IEEE TVCG 2005
Reviewer, The Netherlands Organisation for Scientific Research
EuroVis 2005, International Programme Committee
Siggraph 2004, Posters Committee
Associate Editor, IEEE Transactions on Visualization and Computer Graphics
Program Committee, Visualization'04
Reviewer, IEEE TVCG 2004
Reviewer, Eurographics
Reviewer, NIH
Reviewer, Visualization'04 Applications
Program Committee, Coordinated & Multiple Views in Exploratory Visualization (CMV2004)
International Program Committee for CGIM 2004
Program Committee, Volume Graphics'03
International Program Committee for VIIP 2003
Program Committee, Coordinated & Multiple Views in Exploratory Visualization (CMV2003)

IASTED Technical Committee on Visualization, 2002-2006
IASTED International Program Committee on Computer Graphics and Imaging, 2004
IASTED International Program Committee on Computer Graphics and Imaging, 2003
Technical Organizing Committee, Visual Data Exploration and Analysis 2001
Papers Committee, Visualization'02
Guest Editor, Journal of Electronic Imaging, October, 2000
Papers Committee, Visualization'01
Reviewer, IEEE TVCG 2001
Papers Committee, Visualization'00
Reviewer, IEEE TVCG 2000
Papers Committee, Visualization'98
Program Committee, Visualization, Imaging and Image Processing (VIIP) 2002
Program Committee, Visualization and Data Analysis 2002
Program Committee, Volume Graphics'01
Program Committee, Visualization'99
Program Committee, Visual Data Exploration and Analysis 2000
Program Committee and Session chair, SPIE Visual Data Exploration and Analysis VI
Guest editor, Journal of Electronic Imaging
Guest editor, IEEE Computer Graphics and Applications
Conference Co-chair, SPIE Visual Data Exploration and Analysis V
Case Studies Co-chair, Visualization'97
Case Studies Co-chair, Visualization'96
Session chair, VisSym'01
Session chair, SPIE Visual Data Exploration and Analysis III
Session chair, 6th Eurographics workshop on Visualization in Scientific Computing
Publicity Co-chair, Reviewer, Visualization'95
Reviewer, IEEE Computer Graphics and Applications, Vis Files
Reviewer, VDA, 2004
Reviewer, Volume Graphics'03
Reviewer, IASTED Software Engineering and Applications, 2002
Reviewer, IASTED Visualization, Imaging, and Image Processing, 2002
Reviewer, IASTED Computer Graphics and Imaging, 2002
Reviewer, Cartography and Geographic Information Science
Reviewer, SPIE Visual Data Exploration and Analysis
Reviewer, Interactive 3D Symposium
Reviewer, VisSym 2000
Reviewer, Computer Graphics Forum
Reviewer, IEEE Visualization, papers, cases, tutorials
Reviewer, IEEE Transactions on Visualization and Computer Graphics
Reviewer, IEEE Computer Graphics and Applications
Reviewer, IEEE Transactions on Computers
Reviewer, IEEE Transactions on Graphics
Reviewer, IEEE Computer
Reviewer, Volume Graphics
Reviewer, ACM Siggraph
Reviewer, ACM/IEEE Volume Visualization Symposium
Reviewer, DOE Proposals
Reviewer, DiMi Proposals
Reviewer/Panelist, NSF Proposals

Membership in Professional Associations (current and past)

Association of Computing Machinery (ACM)
IEEE Senior Member 2002
IEEE Technical Committee on Visualization and Graphics
IEEE Computer Society
IASTED
American Geophysical Union
Socieity for Industrial and Applied Mathematics
American Association for the Advancement of Science (AAAS)
Participating Faculty in the UCSC Center for Biomolecular Engineering

Professional Meetings Attended:

2018 Integrating Science Needs with Advanced Seafloor Sensor Engineering to Provide Early Warning of Geohazards (NSF Visioning Workshop).

2016 EuroVis '16, SPIE Visualization and Data Analysis.

2015 IEEE VCIP '15, GRC Visualization in Science and Education.

2014 Peking Univ, Zhejiang Univ, and Zhejiang Univ of Tech, CCC Uncertainty in Computation Workshop, NSF Panel, Uncertainty and Parameter Space Analysis Workshop.

2013 IEEE Visualization '13.

2012 VAST '12, IEEE Visualization '12.

2011 Workshop on Analysis and Visual Exploration of Cosmology, Working with Uncertainty Workshop, VAST '11, IEEE Visualization '11, Los Alamos National Laboratory ISSDM meeting.

2010 IEEE Visual Analytics Science and Technology '10, IEEE Visualization '10, Los Alamos National Laboratory ISSDM meeting, NSF/Foundation of Data and Visual Analytics PI Meeting, SPIE Visualization and Data Analysis'10, Two NSF Panels.

2009 Gordon Research Conference, Visualization Summer School at the Peking University.

2008 Microsoft Game Development, University of Magdeburg, Zuse Institute Berlin, IEEE Visualization '08, Los Alamos National Laboratory ISSDM meeting.

2007 CITRIS-Asia, DOE/ASCR Visualization and Analytics Workshop, IADIS Computer Graphics and Visualization, Dagstuhl Scientific Visualization, IEEE Visualization '07, Sandia National Laboratories: Uncertainty Quantification/Visualization, Los Alamos National Laboratory ISSDM meeting.

2006 NIH Study Panel (BDMA), CITRIS-Asia, Microsoft Game Development, NIH Study Panel (BST-L), Workshop on Strategic Directions for Seismic Risk Modeling and Decision Support, IEEE Visualization '06.

2005 IEEE Visualization '05, Eurographics TopoInVis '05, SPIE Visualization and Data Analysis '05.

2004 IEEE Visualization '04, Siggraph '04, Dagstuhl Perspective Workshop on Visualizaiton and Image Processing of Tensor Fields, NASA Intelligent Data Understanding meeting, SPIE Visualization and Data Analysis '04.

2003 IEEE Visualization '03, Siggraph'03, Army High Performance Computing Research Center Workshop on Graphics Modeling, Simulation and Visualization IEEE/Eurographics VisSym'03, Haptics'02, CITRIS Foundation Member Meeting, SIAM Conference on Computational Science and Engineering.

2002 American Geophysical Union'02 Fall Meeting, IEEE Visualization '02, Visualization, Imaging, and Image Processing '02, Computer Graphics and Imaging '02, UC Life Science and Information Technology, NASA/Earth Science Technology Office meeting.

2001 IEEE/Eurographics VisSym 2001, NASA PI Meeting, Signal Processing, Pattern Recognition and Applications (SPPRA),Computer Graphics and Imaging Conference, LLNL Sensitivity Analysis Workshop, Workshop on the Intersections between Geospatial Information and Information Technology, Pacific Graphics 2001, IEEE Visualization 2001, Sandia National Laboratories: Uncertainty Quantification/Visualization.

2000 Supercomputing 2000, IEEE Visualization 2000, DARPA PI Meeting, ONR Departmental Research Initiative Workshops, DOE Accelerated Strategic Computing Initiative PI Meeting, IEEE International Geoscience and Remote Sensing Society 2000, European Simulation and Modeling Conference on Verification and Validation, International Conference on Autonomous Agents 2000, NSF Engineering Research Center panel, Pacific Symposium on Biocomputing'00.

1999 Darpa PI Meeting, IEEE Visualization'99, Advances in Parallel and Distributed Computing '99, Nanyang Technological University Centre for Advanced Media Technology and Centre for Graphics and Imaging Technology, Siggraph, National Tri-lab site visit, Joint NSF/DOE Workshop on Large Data Visualization, DOE ASCI PI and Data Visualization Corridor Meeting, NSF NPACI All-hands Meeting, SPIE Visual Data Exploration and Analysis VI, Maui High Performance Computing Center, Pacific Symposium on Biocomputing'99.

1998 Darpa PI Meeting, IEEE Visualization'98, Content Visualization and Intermedia Representation, Siggraph, Security Service Desk Workshop, NSF NPACI Interactive Environments, LANL Predictability workshop, Darpa Collaborative Visualization and Information Management, SPIE Visual Data Exploration and Analysis V.

1997 Darpa PI Meeting, SPIE Visual Data Exploration and Analysis IV, Spring Conference on Computer Graphics, Dagstuhl Scientific Visualization Workshop, Navy NOMP Ad Hoc Modeling Advisory Panel, NSF Grantees Workshop, IEEE Visualization'97.

1996 IEEE Visualization'96, Siggraph, California Coalition for Science & Technology, Sanctuary Currents '96, ONR Workshop on Volume Visualization, SPIE Visual Data Exploration and Analysis III.

1995 NSF Interactive Systems Workshop, IEEE Visualization'95, OCEANS'95, National Center for Geographic Information and Analysis Initiative 17, Eurographics workshop on Visualization in Scientific Computing, SPIE Visual Data Exploration and Analysis, SPIE Multimedia Computing and Networking II.

1994 IEEE Visualization'94, Siggraph, SPIE Visual Data Exploration and Analysis I.

1993 Compugraphics '93, Siggraph, USGS Scientific Visualization Workshop, IEEE Visualization '93, IFIP WG 3.2 on Visualization in Scientific Computing, Navy SciVis and VR Seminar, NOAA Forecast System Laboratory Review.

1992 Biomedical Engineering Conference'92, IEEE Computers in Cardiology.

1991 Siggraph, Workshop on Modeling of Cardiac Conduction and Arrhythmias, Data Visualization on the Connection Machine (course), SDSC Supercomputing Workshop (course).

1990 SCS Multiconference on Distributed Simulation, UCLA Workshop on Parallel Computation, 2nd Artificial Life Conference, Gordon Research Conference on Theoretical Biology.

1989 Siggraph, 5th Annual UC Conference on Nonlinear Science.

UNIVERSITY SERVICE

University Level Service

Summer 2019	External tenure promotion review, University of Oregon
Fall 2018	External tenure promotion review, University of Arizona
Fall 2017	External full professor promotion review, Mississippi State University
Spring 2017	External tenure promotion review, Georgetown University
Spring 2017	External tenure promotion review, University of Houston
Winter 2017	External tenure promotion review, Ohio State University
Spring 2015	ARCS Selection Committee
Fall 2013	Tenure promotion committee, UCSC
Summer 2013	External full professor promotion review, University of Utah
Summer 2013	External tenure promotion review, University of Pittsburgh
Spring 2013	External tenure promotion review, Peking University
Fall 2012	External tenure promotion review, University of Tennessee
Spring 2012	External acceleration review, UC Irvine
Fall 2011	External full professor promotion review, Ohio State
Fall 2011	External tenure promotion review, Mississippi State University
Fall 2011	External upper step level Professor review, UC Davis
Fall 2010	Full professor promotion review committee, international.
Fall 2010	External tenure promotion review, California State San Luis Obispo
Fall 2010	UC (another campus) Chair Personnel Committee
Fall 2010	External tenure promotion review, Queen's University
Fall 2009	External tenure promotion review, Oregon State University
Fall 2008	External tenure promotion review, Mississippi State University
Fall 2008	External tenure promotion review, Utah State University
Fall 2007	External letter writer for professor and vice chancellor levels
Winter 2005	External tenure promotion review, UC Irvine
Spring 2004	External tenure promotion review, Ohio State University
Fall 2004	External full professor promotion review, Rutgers University
2003–2004	UCSC Adhoc Committee on Academic Personnel.
2003–2004	UCLEADS Mentor Program.
Fall 2002	External tenure promotion review, North Carolina State University
Fall 2000	External tenure promotion review, UC Davis

2002	UCSC Research Council Member to the UC DIMI Program.
2002	UCSC Representative to Systemwide Committee on Computing.
1999	Science Technology and Education Day at NASA Ames, 7/31/99: "Flow Visualization" and "Comparisons of Wind Tunnel and Computational Fluid Dynamics Data".
1998	Conflict of Interest Management Team.
Fall 1997	External full professor promotion review, Mississippi State University
1994–1995	Summer Science Honors Institute, and CAMP/MESA, UCSC/Cabrillo Summer Research Workshop.

Campus Level Service

2019	Merrill Undergraduate Research Mentorship Program
2018–2019	Graduate Council
Spring 2018	Graduate Council
2017–2018	Faculty Mentorship Program (mentor)
2017–2018	Committee on Career Advising
2016–2017	Charges Committee
2016–2017	Priviledge and Tenure Committee
2015–2016	ARCS Scholarship Review Committee
2015–2016	Charges Committee
2015–2016	Priviledge and Tenure Committee
Winter and Spring 2015	Charges Committee
2013–2014	Priviledge and Tenure Committee
Winter 2012	Provost search committee
Spring 2010	Adhoc Committee on Academic Personnel
Fall 2009	Computing Infrastructure Committee
2008–2009	Committee on International Education Adhoc Committee on Academic Personnel, Chair
2007-2008	Committee on International Education CE Assistive Technology Faculty Search Committee
2005–2006	Committee on Faculty Welfare
Winter 2005	Committee on Computing and Technology, Chair
2004–2007	Information Technology Committee
2002–2004	Divisional Committee on Academic Personnel
2001–2005	Committee on Computing and Technology
2001–2002	Divisional Committee on Academic Personnel

1999	UCSC Architecture Planning Program
1999–2000	CAMP Faculty Mentor
1992–1993	Faculty Search Committee, Environmental Studies Board
1992–1993	Advisory Committee, California Alliance for Minority Participation in Science

Departmental Service

2018–2019	CS Graduate Director.
2017–2018	CS Graduate Director. CS Chair Advisory Committee. Personnel Committee.
2016–2017	CS Graduate Director. Personnel Committee.
2015–2016	CS Graduate Director
2014–2015	Help prepare program learning outcomes for CS undergraduate and graduate degree programs.
2014–2015	Help prepare external review materials.
2011–2013	CS Graduate Admissions Director. Chair on Personnel Committee.
2010–2011	CS Personnel Committees (3x), Chair (2x), and 2 external cases, CS Graduate Committee, CS representative to the Achievement Rewards for College Scientists (ARCS) Selection Committee.
2009–2010	CS Undergraduate Committee, CS Chair Search Committee.
2008–2009	CS representative to DANM, CS Undergraduate Committee, CS Faculty Search Committee, Chair of Ad-hoc Personnel Committee.
2007–2008	CE Assistive Technology Faculty Search Committee, CS Faculty Search Committee, Chair of Ad-hoc Personnel Committee.
2006–2007	CS Faculty Search Committee, CS Undergraduate Director, Information Technology Institute (ITI) Executive Committee, member and chair on personnel committees.
2005–2006	CS Faculty Search Committee, CS Undergraduate Director, ITI Executive Committee, member and chair on personnel committees.
2004–2005	CS Adjunct Professor Review Committee, CS Undergraduate Director, ITI Executive Committee, CS Personnel Committee. CS 160 Comprehensive Exam Coordinator.
2003–2004	Technical Services Committee, ITI Executive Committee, Senate CCT, Undergraduate Director (from Fall 2002), CS Personnel Committee.
2002–2003	NASA Academic Expo (May 20, 2003), Technical Services Committee, SOE and Campus Orientation Tours (Spring 2003), Undergraduate Director (from Fall 2002), Service Level Agreement committee, Undergraduate Committee, CMPS 160 Comprehensive Exam Coordinator, CS Personnel Committee.
2001–2002	IT Service Assessment Committee, Undergraduate Committee, Scholar's Day, Graduate admissions, Divisional Committee on Academic Personnel, CS Personnel Committee.
2000–2001	Undergraduate Committee (curriculum, honors), Research Seminar coordinator, Graduate Committee on Outreach and retention, curriculum.
1999–2000	Graduate Committee on Outreach and retention, curriculum; CS Personnel Committee.

1998–1999	Undergraduate Committee.
1996–1998	Facilities Committee.
1997	CS Personnel Committee.
1995	Fall '95 Research Seminar Coordinator.
1991–1994	CIS 160 Comprehensive Exam Coordinator.
1992–1993	CIS Graduate Admissions Committee.
1991–1992	Faculty Search Committee, Computer & Information Sciences Board.
1990–1995	Assistant Undergraduate Advisor, Computer & Information Sciences Board.
1990–1991	Coordinator, Scientific Visualization Seminars.

TEACHING 1990–91

				Enrolled	%Eval Retd	Shared?
Fall	CIS	290B	Topics in Scientific Visualization	9	78	No
Winter	CIS	260	Computer Graphics	7	86	No
Spring	CIS	12A	Introduction to Programming	62	56	No
	CIS	195	Senior Thesis Research	1	0	No
	CIS	297	Independent Study/Research	1	0	No
	CIS	301	Supervised Teaching Experience	2	0	No

TEACHING 1991–92

				Enrolled	%Eval Retd	Shared?
Fall	CIS	12A	Introduction to Programming	76	64	No
	CIS	160	Introduction to Computer Graphics	40	68	No
	CIS	297	Independent Study/Research	3	0	No
	CE	297	Independent Study/Research	1	0	No
	CIS	301	Supervised Teaching Experience	2	100	No
Winter	CIS	198	Independent Study/Research	1	0	No
	CIS	260	Computer Graphics	12	83	No
	CIS	299	Thesis Research	4	0	No
	CE	299	Thesis Research	2	0	No
Spring	CIS	198	Independent Study/Research	2	0	No
	CIS	299	Thesis Research	3	0	No
	CE	299	Thesis Research	2	0	No

TEACHING 1992–93

				Enrolled	%Eval Retd	Shared?
Fall	CIS	198	Independent Study/Research	1	0	No
	CIS	299	Thesis Research	4	0	No
	CE	299	Thesis Research	3	0	No
Winter	CIS	198	Independent Study/Research	1	0	No
	CIS	260	Computer Graphics	17	76	No
	CIS	299	Thesis Research	6	0	No
	CE	299	Thesis Research	3	0	No
Spring	CIS	12A	Introduction to Programming	79	62	No

	CIS	160	Intro Computer Graphics	25	84	No
	CIS	195	Senior Thesis Research	1	0	No
	CIS	297	Independent Study/Research	1	0	No
	CIS	299	Thesis Research	9	0	No
	CIS	301	Supervised Teaching Experience	4	75	No

TEACHING 1993–94

				Enrolled	%Eval Retd	Shared?
Fall	CIS	297	Independent Study/Research	2	0	No
	CIS	299	Thesis Research	5	0	No
Winter	CIS	198	Independent Study/Research	1	0	No
	CIS	297	Independent Study/Research	2	0	No
	CIS	299	Thesis Research	6	0	No
Spring	CIS	12A	Introduction to Programming	70+2	50	No
	CIS	160	Intro Computer Graphics	22+1	65	No
	CIS	198	Independent Study/Research	1	0	No
	CIS	297	Independent Study/Research	1	0	No
	CIS	299	Thesis Research	9	0	No
	CIS	301	Supervised Teaching Experience	3	100	No

TEACHING 1994–95

				Enrolled	%Eval Retd	Shared?
Fall	CIS	12A	Introduction to Programming	117+1	68	No
	CIS	198	Independent Study/Research	3	0	No
	CIS	297	Independent Study/Research	2	0	No
	CIS	299	Thesis Research	3	0	No
	CIS	301	Supervised Teaching Experience	2	100	No
Winter	CIS	12B	Introduction Data Structures	65+2	84	No
	CIS	198	Independent Study/Research	2	0	No
	CIS	260	Computer Graphics	17	59	No
	CIS	297	Independent Study/Research	2	0	No
	CIS	301	Supervised Teaching Experience	2	100	No
Spring	CIS	94F*	Group Tutorial	7+2	88	No
	CIS	297	Independent Study/Research	3	0	No

*2 credit course.

TEACHING 1995–96

				Enrolled	%Eval Retd	Shared?
Fall	CIS	160	Intro Computer Graphics	24	83	No
	CIS	193	Field Study	1	0	No
	CIS	299	Thesis Research	2	0	No
Winter			Sabbatical Leave			
	CIS	299	Thesis Research	1	0	No
Spring			Sabbatical Leave			
	CIS	299	Thesis Research	2	0	No
Summer	CIS	297	Independent Study/Research	1	0	No

TEACHING 1996–97

				Enrolled	%Eval Retd	Shared?
Fall	CIS	160	Intro Computer Graphics	26	81	No
	CS	198	Independent Study/Research	2	0	No
	CS	297	Independent Study/Research	4	0	No
	CS	301	Supervised Teaching Experience	1	100	No
Winter	CS	198	Independent Study/Research	2	0	No
	CS	260	Computer Graphics	19	68	No
	CS	299	Thesis Research	6	0	No
Spring	CS	94F*	VRML	29	52	No
	CS	198	Independent Study/Research	1	0	No
	CS	299	Thesis Research	4	0	No
Summer	CS	299	Thesis Research	1	0	No

TEACHING 1997–98

				Enrolled	%Eval Retd	Shared?
Fall	CS	80V	3D Worlds on the Web	32	56	No
	CS	160	Intro Computer Graphics	18	100	No
	CS	198	Independent Study/Research	1	0	No
	CE	293	Human Computer Interfaces	4	100	Yes
	CS	297	Independent Study/Research	3	0	No
	CS	299	Thesis Research	4	0	No
	CS	301	Supervised Teaching Experience	1	0	No
Winter	CS	260	Computer Graphics	15	87	No
	CS	297	Independent Study/Research	5	0	No
	CS	299	Thesis Research	6	0	No
Spring	CS	198	Independent Study/Research	2	0	No
	CS	297	Independent Study/Research	4	0	No
	CS	299	Thesis Research	5	0	No

TEACHING 1998–99

				Enrolled	%Eval Retd	Shared?
Fall	CS	160	Intro Computer Graphics	22	73	No
	CS	60G	Beginning Programming	42	88	No
	CS	297	Independent Study/Research	5	0	No
	CS	299	Thesis Research	4	0	No
	CS	301	Supervised Teaching Experience	1		No
Winter	CS	297	Independent Study/Research	4	0	No
	CS	299	Thesis Research	3	0	No
Spring	CS	297	Independent Study/Research	4	0	No
	CS	299	Thesis Research	3	0	No

TEACHING 1999–00

				Enrolled	%Eval Retd	Shared?
Fall	CS	160	Intro Computer Graphics	24	69	No
Fall	CS	193	Field Study	1	1	No
	CS	297	Independent Study/Research	4	0	No
	CS	299	Thesis Research	3	0	No

	CS	301	Supervised Teaching Experience	1		No
Winter	CS	12A	Introduction to Programming	107+1	50	No
	CS	297	Independent Study/Research	4	0	No
	CS	299	Thesis Research	4	0	No
	CS	301	Supervised Teaching Experience			No
Spring	CS	297	Independent Study/Research	1	0	No
	CS	299	Thesis Research	5	0	No

TEACHING 2000–01

				Enrolled	%Eval Retd	Shared?
Fall	CS	297A	Individual Study	2	0	no
	CS	299B	Thesis Research	5	0	no
Winter	CE	297A	Individual Study	1	0	no
	CE	299B	Thesis Research	1	0	no
	CS	12A	Introduction Programming	135	52	no
	CS	260	Computer Graphics	13	69	no
	CS	297A	Individual Study	1	0	no
	CS	297B	Individual Study	2	0	no
	CS	299B	Thesis Research	1	0	no
	CS	299C	Thesis Research	1	0	no
	CS	301	Supervised Teaching Experience	2	0	no
Spring	CE	297B	Individual Study	1	0	no
	CS	160	Introduction Computer Graphic	24	63	no
	CS	297A	Individual Study	1	0	no
	CS	297B	Individual Study	1	0	no
	CS	299A	Thesis Research	3	0	no
	CS	299B	Thesis Research	2	0	no
Summer	CS	297A	Individual Study	2	0	no

TEACHING 2001–02

				Enrolled	%Eval Retd	Shared?
Fall	CS	296	Masters Project	1	0	no
	CS	297A	Individual Study	1	0	no
	CS	297B	Individual Study	1	0	no
	CS	299A	Thesis Research	1	0	no
	CS	299B	Thesis Research	1	0	no
Winter	CS	161	Vis/Computer Animation	16	100	no
	CS	297A	Individual Study	2	0	no
	CS	297C	Individual Study	1	0	no
	CS	299A	Thesis Research	1	0	no
	CS	299B	Thesis Research	1	0	no
Spring	CS	198	Individual Study/ Research	1	0	no
	CS	260	Computer Graphics	5	100	no
	CS	297C	Individual Study	1	0	no
	CS	299A	Thesis Research	1	0	no
	CS	299B	Thesis Research	3	0	no

TEACHING 2002–03

				Enrolled	%Eval Retd	Shared?

Fall	CMPS 80V	VRML: 3D World on Web	32	78	no
	CMPS 297A	Individual Study	1	0	no
	CMPS 297B	Individual Study	1	0	no
Winter	CMPS 161	Vis/Computer Animation	23	83	no
	CMPS 260	Computer Graphics	6	100	no
	CMPS 297A	Individual Study	1	0	no
	CMPS 297B	Individual Study	1	0	no
Spring	CMPS 297A	Individual Study	2	0	no

TEACHING 2003–04

			Enrolled	%Eval Retd	Shared?
Fall	CMPS 12A	Intro Programming	49	59	no
	CMPS 297A	Individual Study	1	0	no
	CMPS 297B	Individual Study	1	0	no
	CMPS 297C	Individual Study	1	0	no
Winter	CMPS 161	Vis/Computer Animation	23	87	no
	CMPS 297A	Individual Study	1	0	no
Spring	CMPS 198	Ind Study or Research	1	0	no
	CMPS 297A	Individual Study	1	0	no
	CMPS 297B	Individual Study	1	0	no

TEACHING 2004–05

			Enrolled	%Eval Retd	Shared?
Fall	CMPS 290B	Adv Computer Graphics	4	100	no
	CMPS 297A	Individual Study	1	0	no
	CMPS 297C	Individual Study	1	0	no
Winter	CMPS 12A	Intro Programming	109	42	no
	CMPS 161	Vis/Computer Animation	15	87	no
	CMPS 161L	Vis and Comp Anim Lab	9	0	no
	CMPS 161L	Vis and Comp Anim Lab	5	0	no
	CMPS 297A	Individual Study	1	0	no
	CMPS 297B	Individual Study	1	0	no
	CMPS 299A	Thesis Research 2	3	0	no
Spring	CMPS 198	Ind Study or Research	1	0	no
	CMPS 297B	Individual Study	2	0	no
	CMPS 299A	Thesis Research 2	3	0	no

TEACHING 2005–06

			Enrolled	%Eval Retd	Shared?
Fall	CMPS 80V	VRML 3D Worlds on the Web	18	83	no
	CMPS 297A	Individual Study	1	0	no
	CMPS 297B	Individual Study	2	0	no
	CMPS 299A	Thesis Research	2	0	no
Winter	CMPS 161/L	Vis/Computer Animation	16	88	no
	CMPS 198	Individual Study	1	0	no
	CMPS 198F	Individual Study	1	0	no
	CMPS 297A	Individual Study	1	0	no
	CMPS 297B	Individual Study	1	0	no

	CMPS 299A	Thesis Research	3	0	no
	CMPS 299B	Thesis Research	1	0	no
Spring	CMPS 297B	Individual Study	1	0	no
	CMPS 299A	Thesis Research	3	0	no
	CMPS 299B	Thesis Research	1	0	no
Summer	CMPE299	Thesis Research	1	0	no

TEACHING 2006–07

			Enrolled	%Eval Retd	Shared?
Fall	CMPS 297A	Individual Study	1	0	no
	CMPS 299A	Thesis Research	1	0	no
	CMPS 299B	Thesis Research	2	0	no
Winter	CMPS 161/L	Vis/Computer Animation	14	64	no
	CMPS 299B	Thesis Research	1	0	no
Spring	CMPS 164	Game Engines	13	62	no
	CMPS 299B	Thesis Research	1	0	no

TEACHING 2007–08

			Enrolled	%Eval Retd	Shared?
Fall	CMPS 164	Game Engines	3	100	no
	CMPS 297A	Individual Study	1	0	no
	CMPS 299B	Thesis Research	1	0	no
Winter	CMPS 161	Vis/Computer Animation	9	100	no
	CMPS 297A	Individual Study	1	0	no
	CMPS 299A	Thesis Research	1	0	no
	CMPS 299B	Thesis Research	1	0	no
Spring	CMPS 297A	Individual Study	1	0	no
	CMPS 299A	Thesis Research	2	0	no
	CMPS 299B	Thesis Research	1	0	no

TEACHING 2008–09

			Enrolled	%Eval Retd	Shared?
Fall	CMPS 80V	Creating Virtual Worlds on the Web	50	48	no
	CMPS 297C	Individual Study	1	0	no
	CMPS 299C	Thesis Research	1	0	no
Winter	CMPS 161	Vis/Computer Animation	23	96	no
	CMPS 297B	Individual Study	1	0	no
	CMPS 299C	Thesis Research	1	0	no
Spring	CMPS 164	Game Engines	20	80	no
	CMPS 198F	Individual Study	1	0	no
	CMPS 299B	Thesis Research	1	0	no
	CMPS 299C	Thesis Research	1	0	no

TEACHING 2009–10

			Enrolled	%Eval Retd	Shared?
Fall	CMPS 160/L	Introduction to Computer Graphics	63	65	no

	CMPS 198F	Individual Study	1	0	no
	CMPS 297B	Individual Study	1	0	no
Winter	CMPS 161/L	Vis/Computer Animation	21	62	no
	CMPS 297A	Individual Study	1	0	no
Spring	CMPS 261	Advanced Visualization	7	114	no
	CMPS 297A	Individual Study	1	0	no

TEACHING 2010–11

			Enrolled	%Eval Retd	Shared?
Fall	CMPS 198F	Individual Study	1	0	no
	CMPS 297A	Individual Study	2	0	no
Winter	CMPS 161/L	Vis/Computer Animation	34	53	no
	CMPS 12A/L	Introduction to Programming	122	40	no
	CMPS 198F	Individual Study	1	0	no
	CMPS 297A	Individual Study	1	0	no
	CMPS 297B	Individual Study	1	0	no
Spring	CMPS 262	Computer Animation	5	100	no
	CMPS 297A	Individual Study	1	0	no

TEACHING 2011–12

			Enrolled	%Eval Retd	Shared?
Fall	CMPS 12A/L	Introduction to Programming	140	63	no
	CMPS 297A	Individual Study	1	0	no
	CMPS 299C	Thesis Research	1	0	no
Winter	CMPS 161/L	Intro Data Visualization	18	28	no
	CMPS 297A	Individual Study	1	0	no
	CMPS 297C	Individual Study	1	0	no
Spring	CMPS 162/L	Advanced Computer Graphics/Animation	8	63	no
	CMPS 297B	Individual Study	1	0	no
	CMPS 299C	Thesis Research	1	0	no

TEACHING 2012–13

			Enrolled	%Eval Retd	Shared?
Fall	CMPS 160/L	Intro Computer Graphics	69	58	no
	CMPS 198	Independent Study	1	0	no
	CMPS 297A	Individual Study	1	0	no
	CMPS 297B	Individual Study	1	0	no
	CMPS 297C	Individual Study	1	0	no
	CMPS 299B	Thesis Research	1	0	no
Winter	CMPS 198	Independent Study	1	0	no
	CMPS 297A	Individual Study	1	0	no
	CMPS 299B	Thesis Research	1	0	no
Spring	CMPS 160/L	Intro Computer Graphics	29	45	no
	CMPS 297A	Individual Study	2	0	no
	CMPS 299C	Thesis Research	1	0	no

TEACHING 2013–14

			Enrolled	%Eval Retd	Shared?
Fall	CMPS 261	Advance Visualization	11	64	no
	CMPS 297A	Individual Study	1	0	no
	CMPS 299C	Thesis Research	1	0	no
Winter	CMPS 12A/L	Introduction to Programming	189	48	no
	CMPS 161/L	Intro Data Visualization	16	69	no
	CMPS 299A	Thesis Research	1	0	no
	CMPS 299C	Thesis Research	1	0	no
Spring	CMPS 299B	Thesis Research	1	0	no
	CMPS 299C	Thesis Research	1	0	no

TEACHING 2014–15

			Enrolled	%Eval Retd	Shared?
Fall	CMPS 299B	Thesis Research	1	0	no
	CMPS 299C	Thesis Research	1	0	no
Winter	CMPS 12A/L	Introduction to Programming	199	44	no
	CMPS 299B	Thesis Research	1	0	no
	CMPS 299C	Thesis Research	1	0	no
Spring	CMPS 160/L	Intro Computer Graphics	36	42	no
	CMPS 299C	Thesis Research	1	0	no

TEACHING 2015–16

			Enrolled	%Eval Retd	Shared?
Fall	CMPS 200	Research and Teaching	50	0	yes
	CMPS 261	Advanced Visualization	13	0	no
	CMPS 296	Independent Study	1	0	no
	CMPS 297	Independent Study	1	0	no
Winter	CMPS 296	Independent Study	1	0	no
	CMPS 297	Independent Study	1	0	no
Spring	CMPS 160/L	Intro Computer Graphics	74	0	no
	CMPS 297	Independent Study	2	0	no

TEACHING 2016–17

			Enrolled	%Eval Retd	Shared?
Fall	CMPS 200	Research and Teaching	95	0	yes
	CMPS 160/L	Intro Computer Graphics	42	0	no
	CMPS 296	Masters Project	2	0	no
	CMPS 297A	Individual Study	1	0	no
	CMPS 299B	Thesis Research	1	0	no
Winter	CMPS 161/L	Intro Data Visualization	17	0	no
	CMPS 299B	Thesis Research	1	0	no
Spring	CMPS 193	Field Study	1	0	no
	CMPS 198	Independent Study	1	0	no
	CMPS 296	Masters Project	2	0	no
	CMPS 297A	Individual Study	1	0	no
	CMPS 299B	Thesis Research	1	0	no
Summer	CMPS 297	Individual Study	9	0	no

TEACHING 2017–18

			Enrolled	%Eval Retd	Shared?
Fall	CMPS 200	Research and Teaching	29	0	yes
	CMPS 160/L	Intro Computer Graphics	36	0	no
	CMPS 198	Independent Study	1	0	no
	CMPS 296	Masters Project	3	0	no
	CMPS 297A	Individual Study	3	0	no
	CMPS 297B	Individual Study	1	0	no
Spring	CMPS 261	Advanced Visualization	3	0	no
	CMPS 296	Masters Project	1	0	no
	CMPS 297A	Individual Study	1	0	no
Summer	CMPS 193	Field Study	1	0	no
	CMPS 297	Individual Study	19	0	no
	CMPS 297A	Individual Study	1	0	no

TEACHING 2018–19

			Enrolled	%Eval Retd	Shared?
Fall	CMPS 200	Research and Teaching	55	0	yes
	CMPS 297B	Individual Study	1	0	no
	CMPS 297C	Individual Study	1	0	no
Winter	CMPS 161/L	Intro Data Visualization	25	0	no
	CMPS 261	Advanced Visualization	13	0	no
Spring	CMPS 280J	Seminar Computer Graphics	9	0	yes
Summer	CMPS 297A	Individual Study	3	0	no

TEACHING 2019–20

			Enrolled	%Eval Retd	Shared?
Summer	CMPS 297A	Individual Study	3	0	no

OTHER TEACHING

Developed and got approval for new course – CMPS 168: Introduction to Augmented Reality and Virtual Reality.

PhD Dissertation Supervised:

2015	Brad Hollister	*Visualizing Multimodal Uncertainty in Ensemble Vector Fields*
2009	Alisa Neeman	*Visualization Techniques for Computational Mechanics*
2005	Xiaoqiang Zheng	*Visualizing Second-Order Tensor Fields*
2004	Doanna Weissgerber	*Haptic Visualization – The Use of Multimodal Visualization to Better Interpret Multi-variate Data*
2004	Alison Love	*Visualizing Spatial Multi-valued Data*
2001	Suzana Djurcilov	*Visualizing Gridded Datasets with Large Number of Missing Values*
2001	Vivek Verma	*Visualization and Feature Level Comparisons in Fluid Flow*
2001	Kwansik Kim	*Data Level Comparison of Direct Volume Rendering Algorithms*
1995	Naim Alper	*Mix&Match: A Construction Kit for Scientific Visualization*
1994	Koji Amakawa	*Estimation of Distributed Parameters by Multiresolution Optimization*

PhD Dissertation Committee Member:

2019	Morteza Behrooz	*Curating Interest in Open Story Generation*
2018	Seongdo Kim	*Multi-Planar 3D Reconstruction of Indoor Manhattan Scenes From Monocular Camera (CE)*
2016	Amin Kheradmand	*Graph-Based Image Restoration (EE)*
2015	Hossein Talebi	*Global Image Filtering (EE)*
2015	Alexandra Holloway	*Design of a Data-Driven Micro-Display for Situation Awareness in Bursty Environments (When Not Much Is Happening Most of the Time) (CS)*
2014	Jeremy Gottlieb	*A Computationally Tractable Information Foraging Algorithm That Satisfies Time-To-Go Constraints (CS)*
2013	Xiang Zhu	*Measuring Spatially Varying Blur and Its Application in Digital Image Restorations (EE)*
2010	Ji-Wung "Karl" Choi	*Real-Time Motion Planning for Obstacle Avoidance in Autonomous Ground Vehicles (CE)*
2008	Alexander Streit	*Encapsulation and Abstraction for Modeling and Visualizing Information Uncertainty (Queensland University of Technology, Australia)*
2008	Tino Weinkauf	*Extraction of Topological Structures in 2D and 3D Vector Fields (Otto von Guericke University of Magdeburg, Germany)*
2002	Paul A. Ferry	*Eikon: A Tool for Geometric Coding of Large Multivariate Datasets (University of Alberta, Canada)*
2002	Jose Renteria	*Feature Driven Compression and Simplification of 2D Vector Fields (CS)*
2002	Bruce Durgan	*Lossless Compression of Spectrally Limited Color Images (CE)*
1999	Joceli Mayer	*Blending Models for Image Enhancement and Coding (CE)*
1996	Kevin Montgomery	*Automated Reconstruction of Neural Elements from a Transmission Electron Microscope Images (CE)*
1995	Ned Greene	*Hierarchical Rendering of Complex Environments (CS)*

PhD Students Advanced:

2013	Brad Hollister
2007	Alisa Neeman
2004	Xiaoqiang Zheng
2002	Alison Luo
2001	Doanna Weissgerber
2000	Suzana Djurcilov
1999	Vivek Verma
1999	Marc Hansen
1998	Kwansik Kim

PhD Advancement to Candidacy Chair or Committee Member:

2018	Suzanne da Camara	*CS*
2017	Seongdo Kim	*CE*
2015	Sean Smith	*CS*
2014	Amin Kheradmand	*EE*
2013	Chelhwon Kim	*CS*
2012	Jeremy Gottlieb	*CS*
2012	Phil Heller	*BioInformatics*
2010	Xiang Zhu	*EE*
2008	Karl Ji-Wung Choi	*CE*
2004	Dan Yuan	*CE*
2000	Jose Renteria	*CS*
2000	Katsuhara Suzuki	*CE*
1998	Joceli Mayer	*CE*
1996	Bruce Durgan	*CE*
1995	Kevin Montgomery	*CE*

Curricular Practical Training Masters and PhD Students:

2019	Jincheng Li	*Amazon*
2019	Alan Peral Ortiz	*Cadence*
2019	Jie Yin	*Dolby Labs*
2018	Ada Ma	*LinkedIn*
2018	Trung Nguyen	*Jargonauts Inc*
2018	Ahmed Elshaarany	*BMW*
2017	Sanjana Woonna	*Olabot*
2017	Akhil Dixit	*8x8*
2017	Vedang Joshi	*eBay*
2017	Yu-An Lin	*Proofpoint*
2017	Ashwini Patil	*8x8*
2017	Ahmed Elshaarany	*BMW*
2016	Can Gao	*virtroid*
2016	Xiao Li	*eBay*
2016	Jun Liu	*Amazon*
2016	Jinsha Wang	*Amazon*
2016	Guangyu Wang	*eBay*
2016	Nan Ding	*Vertas*
2016	Zheng Lin	*Facebook*
2016	Jiawei Chen	*eBay*
2016	Bai Han	—

Masters Thesis and Students Supervised:

2019	Samuel Gabbard	*Feature Visualization for Damped Ly-alpha Absorption Lines Convolutional Neural Network*
2017	Gbolahan Samuel Adesoye	*Joint Mobile-Cloud Video Stabilization*
2016	Shweta Philips	*Detecting and Visualizing Rip Currents Using Optical Flow*
2015	Georg Albrecht	*Interactive High Dimensional Data Analysis using Three Experts*
2014	Yani Zhang	*Boundary Constraints in Force-Directed Graph Layout*
2012	Nathaniel Cesario	*Flexible Graph Layouts*
2011	Uliana Popov	*Analyzing the Evolution of Large Scale Structures in the Universe with Velocity Based Methods*
2010	Robert Chalhoub	*GPU-Assisted Subdivision of Multiple Meshes*
2009	Eddy Chandra	*Exploring Multistreaming in the Universe*
2008	Jack Feng	*Motion Capture Data Retrieval Using an Artist's Doll*
2008	Jeffrey Sukharev	*Tracing Parallel Vectors*
2006	Robert Hero	*Transfer Function Design for Volume Visualization of Multi-Valued and Multi-Variate Datasets*
2005	Xiaohong Ye	*Seeding Strategies for 3D Flow Data*
2004	Wei Shen	*Seeding Strategies for Hyperstreamlines*
2001	Bing Zhang	*3D Steady Flow Visualization*
2001	Alison Luo	*A Variable Precision Hybrid Camera Calibration Method*
2001	Kevin Freeman	*Photon Mapping and Real-Time Global Illumination*
2001	Marc Hansen	*Visualizing Protein Alignments*
2001	Laixin Zhou	*Metrics and Visualization Tools for Surface Mesh Comparison*
2000	Wei Ma	*CE Course Only Masters*
1999	Qin Shen	*Data Level Comparison of Wind Tunnel and Computational Fluid Dynamics Data*
1998	Ed Boring	*Visualization of Tensor Fields*
1998	Jeff Brainerd	*Interactive Map Projections and Distortion Visualization*
1998	Suzana Djurcilov	*Visualization Tools for Weather Forecasting*
1997	Adam Freeman	*Methods for Visualizing Uncertainty*
1995	Michael Clifton	*Direct Virtual Visualization*
1994	Tom Goodman	*Collaborative Scientific Visualization*
1993	Kyle Smith	*SPRAYIT: An Implementation of Spray Rendering: A Paradigm for Scientific Visualization*
1992	Ian Falicov	*Hybrid Algorithms for Hidden Surface Elimination*

Masters Thesis Committee Member:

2017	Annlin Sheih	*Gentrification and Its Effects on Affordable Housing in San Francisco*
2016	Qinqin Zhu	*Evaluation of Conversational Question Answering*
2016	Saumya Bhatnagar	*Developing a Web Platform to Strategically Evolve Corporate Social Responsibility*
2014	Yi Zhao	*Behavior Classification of Large Animal Using Hidden Markov Model*
2014	Charles Park	*Gesture Controlled Lecture Camera*
2014	Mohammad Hossein Daraei	*Investigation into Optical Flow Problem in the Presence of Spatially-varying Motion Blur*
2013	Thomas Lindsey Freeman	*Dynamic Camera Control Replay System*
2012	Dustin Escoffery	*A Framework for Learning Photographic Composition Preferences from Gameplay Data*
2007	Jerry Yee	*Crowd Rendering with Non-Planar 3D Impostors*
2007	Jacob Telleen	*Synthetic Shutter Speed Imaging*
2006	Alana Perlin	*Interactive Interiors – MFA*
2006	Oliver Wang	*Using Aerial LIDAR Data to Segment and Model Buildings*
2004	Alex D'Angelo	*Relighting Real-World Scenes*
2004	Shailaja Vats	*Clustering of Aerial Lidar Data into Buildings and Trees using KL Divergence between Height Distributions*
2000	Travis Heppe	*Integration of Surface Simplification into a Retained-Mode Graphics*
1999	Aleksandra Kuswik	*Multimedia Application for Teaching Dance*
1998	Abigail Joseph	*UISURF: Visualizing Uncertainty in Isosurfaces*
1997	Jonathan Gibbs	*AEAE: Adaptive Evolutionary Animation Environment*
1996	Michelle Nesbit	*Capturing Human Motion*
1994	James Bill	*Computer Sculpting of Polygonal Models using Virtual Tools*
1994	Andrew John	*Volume Visualization of Hierarchically Resampled Curvilinear Grids*
1994	Kevin Montgomery	*Advances in Three Dimensional Serial Section Reconstruction and Visualization of Neural Tissue from Transmission Electron Microscopy*
1994	Carl Wescott	*PALette: A Platform-independent Animation Language*
1993	Louis Goldstein	*The Design and Prototype of an Interactive Browser Interface to an Electronic Library*
1993	David van Brink	*Wave shaping with DC Offset: A Computationally Inexpensive Method of Musical Synthesis*
1992	Sharon Fischler	*Interactive Language-Based Object Manipulation*
1992	J. Andres-Larsen	*GEOINFO: A Hypermedia-Style Map Interface to Geographic Information*
1991	Dean Mackie	*Volume Rendering with Hermite Tricubics*
1991	Peter Hughes	*Mars Navigator*
1990	Mark Henne	*Constraint-Based Skin Model for Human Figure Animation*

Masters Project Supervised:

2018	Ya Xu	*Automatic Document Clustering*
2017	Aishna Agrawal	*GeoAR: Android Application with POI Helper*
2017	Aakash Thakkar	*GeoAR: POI Helper Backend as an API Service*
2017	Chengye Tang	*Analysis of Application for MS at Jack Baskin School of Engineering*
2016	Jiawei Chen and Zheng Lin	*Analysis of Yelp and TripAdvisor Text Reviews*
2015	Yue Tian	*Find Your Next Car: An Assistant for Used Car Buying*

Masters Project Committee Member:

2019	Yuan Yang	*An iOS Application for PTM Scanning and Rendering*
2018	Jiayi Yang	*Real-time Ride-share Service Comparison*
2018	Faeze Brahman	*Improvising "Statement" Dialogue Acts for Naturally Coherent Chat Bot Systems*
2018	Arghyadeep Giri	*Gathering Naturally Occurring Utterances for Chat Bot Systems*
2018	Ada Ma	*Analysis of Lexico-Functional Patterns for Affect Prediction*
2018	Chaoyu Gao	*Use Deep Learning to Predict Thermochemical Equilibrium Calculations*
2018	Sinjoni Mukhopadhyay	*Efficient Reconstruction Techniques for Disaster Recovery in Secret-Split Datastores*
2017	Vedang Joshi	*Benchmarking MongoDB on Disaggregated Flash Storage*
2017	Ashwini Patil	*Water Usage Prediction and Visualization*
2017	Aniket Kulkarni	*Credit Card Fraud Detection: Comparing Data Mining Algorithms*
2017	Patrick Cudahy, Brady Goldman, Shobhit Maheshwari, Madhu Shivashankaraiah	*Coherence Modeling for Open-Domain Conversational Agents*
2017	Namrata Simha, Lixue Zhang, Nicole Johns, Alif Sarker	*Slug MovieBot: Adding Opinions to Alexa MovieBot Responses*
2017	Molly Zhang, Nehal Bengre, Wei Wang	*Reinforcement Learning of Dialogue Response Strategy*

Senior Theses Supervised:

2018	Ryan Tran	*Intersections in Large Graphs*
2004	Peter Bergström	*CircleView, Jim Whitehead – advisor*
2004	Donna Moore	*UO: Creation of a Trial Transcript E-Service*
2003	David Saffren	*NeWSprint: a workstation-based WYSIWYG PostScript Printing Subsystem*
1993	Raul Essig	*A Study in Synthetic Evolution with Respect to Modeling Trees*
1991	Charlotte Wheeler	*Ray Tracing with Depth of Field*

Undergrad Projects Supervised:

2019	David Cosby	*Improving the Uncertainty Cone*
2018	Issei Mori	*Flow-based Rip Current Detection*
2017	Yu-An Lin	*Quality Assurance Dashboard*
2017	Boris Gorshenev	*Robust Rip Current Detection*
2016	Marian Nicasio	*Survey Analysis Using R*
2014	Matthew Jee	*Rendering Probabilistic Trajectories*
2014	Jacob Cohen	*Study on Comparison of Diagnostic Test Accuracies*
2013	Max Nash	*Machine Learning Investigations of Particle MOtion and Structural Formation Behaviors in N-Body Simulations of Dark Matter*
2012	Allison Carlisle	*Visual Decision Aids for Probabilistic Reasoning*
2011	Katarina Yang	*Automatic Transitional Animation Between Visualizations*
2009	Nathaniel Cesario	*Visual Graph Comparisons with Bullseyes*
2009	Nick Green	*Game Engines for Visualization*
2006	Adam Markowitz	*XML Interface for OpenSees*
2005	Tyler Freeman	*File Flyer*
2004	Adrian Sue	*Animation*
2003	Isa Yeung	*Tetruss*

Postdocs and Visiting Faculty Sponsor:

16-17	Yixiang (Andy) Sun	*Nanjing University of Aeronautics and Astronautics*
15-16	Yongjuan Pan	*Zhejiang University of Technology*
13-14	Ying Tang	*Zhejiang University of Technology*
00-00	Jing PeiDong	*Beijing Normal University*
97-98	Chang-Sung Jeong	*Korea University, Korea*
96-97	Eung-Kon Kim	*Sunchon National University, Korea*
93-96	Craig Wittenbrink	*University of Washington, Seattle*

Supervision of Research of Continuing Graduate Students:

PhD	Fahim Hassan Khan	Computer Science and Engineering (with Suresh Lodha)
PhD	Trung Nguyen	Computer Science and Engineering (with Suresh Lodha)
PhD	Hou-I Lin	Computer Science and Engineering (with Suresh Lodha)
PhD	Akila de Silva	Computer Science and Engineering (with Suresh Lodha)
PhD	Alan Peral Ortiz	Computer Science and Engineering (with Suresh Lodha)
PhD	Rongwen Zhou	Computer Science and Engineering (with Suresh Lodha)
PhD	Evan Olds	Computer Science and Engineering (with Suresh Lodha)