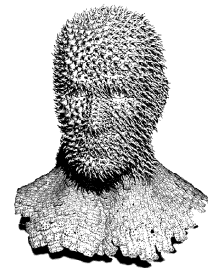


David H. Laidlaw

Box 1910, Department of Computer Science
Providence, RI 02912

401-863-7647

email: dhl@cs.brown.edu
<http://www.cs.brown.edu/~dhl>



Research

Overview Interdisciplinary research into robust and effective computer science and visualization tools to solve problems in biology, fluids, medical imaging, archaeology, geology, geography, and other disciplines. Collaborative work with colleagues in these areas guides the research and provides a mechanism for evaluating the usefulness and robustness of results.

Education Ph.D., Computer Science, California Institute of Technology, 1995.

Geometric Model Extraction from Magnetic Resonance Volume Data

Researched biological applications of computer graphics. Created new computer graphics modeling and animation techniques that collect better magnetic resonance imaging (MRI) data, classify or segment sampled volume data, volume render, and animate extracted models .

M.S., Computer Science, California Institute of Technology, 1992.

Material Classification of Magnetic Resonance Volume Data

Sc.M., Computer Science, Brown University, 1985.

Rendering Parametric Surfaces

Sc.B., Computer Science, Brown University, *summa cum laude*, honors in Math, 1983.

Topology and Mechanics, Honors thesis (film)

Experience **Professor, Brown University**, 2008 to present.

Associate Professor, Brown University, 2003 to 2008.

Stephen Robert Assistant Professor, Brown University, 2000 to 2003.

Assistant Professor, Brown University, 1998 to 2000.

Specific research projects include visualization of vector-valued and tensor-valued volume data, acquiring images of blood pressure measurements and of water diffusion tensor measurements using magnetic resonance, development of geometric tools for archaeology, simulation of human joint dynamics, and visualization of computer programs.

Senior Research Fellow, California Institute of Technology, 1996 to 1998.

Research focussed on quantitative biological and medical imaging and image processing, modeling biological systems, and scientific visualization. Responsible for creating a research plan, raising funds, executing the plan, and directing and supervising students and staff.

Postdoc/Grad. Research Assistant, California Institute of Technology, 1989 to 1996.

Research focused on extracting computer graphics models of animals and plants from 3-D MRI data. Participated in fund-raising and site reviews for the HBP and the distributed NSF Science and Technology Center for Computer Graphics and Scientific Visualization. Achieved research goals from the two projects, including developing tissue classification algorithms, visualizing MRI data, and placing organic textures on geometric models.

Consultant, Stardent/Advanced Visual Systems, 1989 to 1993.

Consulted on design and implementation strategies for Application Visualization System (AVS) scientific visualization software. Implemented new CAD/CAM finite element functionality. Worked with customers to improve their animation and modeling applications.

Software Engineer, Stellar Computer, 1986 to 1989.

Designed, prototyped, and implemented AVS. As first member of the graphics software team at Stellar, helped recruit and build the group, and coordinate with the graphics hardware group. Developed and implemented graphics software architecture for the Stellar graphics supercomputer.

Research Assistant, Brown University, 1983 to 1985.

Consultant, Basel Institute for Immunology, Switzerland, Summer 1984.

Teaching Assistant, Brown University, 1983.

Programmer, Johns Hopkins University, 1980 to 1982.

Honors

2008 IEEE VGTC Visualization Technical Achievement Award

Capstone speaker at IEEE Visualization Conference

Best poster award Nomination, Annual Meeting of International Society for Magnetic Resonance in Medicine

2007 1st Place, NSF/Science International Science & Engineering Visualization Challenge, Informational Graphics, with student Misha Kostandov and several other collaborators

2006 SIGGRAPH, ACM Student Research Competition, 1st place with PhD student Wenjin Zhou

Outstanding Poster Award at 10th International Conference on Alzheimer's Disease – Imaging Consortium

2005 Best Poster award at IEEE Visualization

SIGGRAPH, ACM Student Research Competition, 2nd place with PhD student Daniel Keefe

2004 Best Panel award at IEEE Visualization

- 2003 Henry Merritt Wriston Teaching Fellowship
- 2002 *Computers & Graphics* Second Best Paper Award
- 2001 [Best Case Study award at IEEE Visualization](#)
 Best Layout and Best Scientific Presentation Exhibit Award at the American Society for Surgery of the Hand Annual Meeting
 Awarded NSF CAREER Grant
- 2000 Appointed Stephen Robert Assistant Professor
- 1998 Best Panel award at IEEE Visualization
- 1989 Earl C. Anthony Graduate Fellowship
- 1984 Raster Tech Image Contest
 elected to Sigma Xi

**Journal and
SIGGRAPH**

- Papers**
- 47. A new approach for quantitative phosphoproteomic dissection of signaling pathways applied to t cell receptor activation. Vinh Nguyen, Lulu Cao, Jonathan Lin, Anna Ritz, Norris Hung, Radu Jianu, Benjamin Raphael, David H. Laidlaw, Laurent Brossay, and Arthur Salomon. *Molecular and Cellular Proteomics*, 2009. In Review ([pdf](#)) ([bibtex: Nguyen-2009-NAQ](#)).
 - 46. Using visual design experts in critique-based evaluation of 2D vector visualization methods. Daniel Acevedo, Cullen Jackson, David H. Laidlaw, and Fritz Drury. *IEEE Transactions on Visualization and Computer Graphics*, 14(4):877–884, July 2008. ([pdf](#)) ([bibtex: Acevedo-2008-UVD](#)).
 - 45. Quantitative tractography metrics of white matter integrity in diffusion - tensor MRI. Stephen Correia, David H. Laidlaw, David Tate, Stephanie Lee, Thom Voorn, Robert Paul, Song Zhang, Steven Salloway, and Paul Malloy. *Neuroimage*, 2008. ([pdf](#)) ([bibtex: Correia-2008-QTM](#)).
 - 44. Scientific sketching for collaborative VR visualization design. Daniel Keefe, Daniel Acevedo, Jadrian Miles, Fritz Drury, Sharon Swartz, and David H. Laidlaw. *IEEE Transactions on Visualization and Computer Graphics*, 14(4):835–847, July-August 2008. ([pdf](#)) ([bibtex: Keefe-2008-SSF](#)).
 - 43. Exploratory visualization of animal kinematics using instantaneous helical axes. Daniel Keefe, Trevor M. O’Brien, David B. Baier, Stephen M. Gatesy, Elizabeth L. Brainerd, and David H. Laidlaw. *Computer Graphics Forum (EuroVis 2008 Special Issue)*, 27(3):863–870, 2008. ([pdf](#)) ([bibtex: Keefe-2008-EVA](#)).
 - 42. Visualization criticism. Robert Kosara, Fritz Drury, Lars E. Holmquist, and David H. Laidlaw. *IEEE Computer Graphics and Applications*, 28(3):13–15, 2008. ([bibtex: Kosara-2008-VCX](#)).

41. Quantifying the complexity of bat wing kinematics. DK Riskin, DJ Willis, J. Iriate-Diaz, TL Hedrick, Mykhaylo Kostandov, Jian Chen, David H. Laidlaw, Kenneth Breuer, and Sharon Swartz. *Journal of Theoretical Biology*, 2008. In Press ([pdf](#)) ([bibtex: Riskin-2008-QCB](#)).
40. Frontal white matter integrity in borderline personality disorder with self-injurious behavior. Jon E. Grant, Stephen Correia, Thea Brennan-Krohn, Paul Malloy, David H. Laidlaw, and S. Charles Schulz. *Journal of Neuropsychiatry and Clinical Neurosciences*, 2007. In Press ([doc](#)) ([bibtex: Grant-2007-FWM](#)).
39. Drawing on air: Input techniques for controlled 3D line illustration. Daniel Keefe, Robert Zeleznik, and David H. Laidlaw. *IEEE Transactions on Visualization and Computer Graphics*, 13(5):1067–1080, September/October 2007. ([pdf](#)) ([bibtex: Keefe-2007-DOA](#)).
38. Arthrodiagonal joint markerless cross-parameterization and biomechanical visualization. G. Elisabeta Marai, Cindy Grimm, and David H. Laidlaw. *IEEE Transactions on Visualization and Computer Graphics*, 13(5):1095–1104, September 2007. ([pdf](#)) ([bibtex: Marai-2007-ABS](#)).
37. Diffusion tensor imaging of the corpus callosum: A cross-sectional study across the lifespan. Nicole C.R. McLaughlin, Robert Paul, Stuart M. Grieve, Leanne M. Williams, David H. Laidlaw, Margaret DiCarlo, Richard Clark, William Whelihan, Ronald Cohen, Thomas J. Whitford, and Evian Gordon. *International Journal of Developmental Neuroscience*, 25(4):215–221, June 2007. ([pdf](#)) ([bibtex: McLaughlin-2007-DTI](#)).
36. Neuropsychological and neuroimaging outcome of HIV-associated progressive multifocal leukoencephalopathy in the era of antiretroviral therapy. Robert H. Paul, David H. Laidlaw, David F. Tate, Stephanie Lee, Karin Hoth, John Gunstad, Song Zhang, Jeffrey Lawrence, and Tim Flanigan. *Journal of Integrative Neuroscience*, 6(1):191–204, March 2007. ([pdf](#)) ([bibtex: Paul-2007-NNO](#)).
35. Fluorine-19 MRI for visualization and quantification of cell migration in a diabetes model. Mangala Srinivas, Penelope A. Morel, Lauren A. Ernst, David H. Laidlaw, and Eric T. Ahrens. *Magnetic Resonance in Medicine*, 58:725–734, 2007. ([pdf](#)) ([bibtex: Srinivas-2007-FMV](#)).
34. Subjective quantification of perceptual interactions among some 2D scientific visualization methods. Daniel Acevedo and David H. Laidlaw. *IEEE Transactions on Visualization and Computer Graphics (Proceedings Visualization / Information Visualization)*, 12(5), September-October 2006. ([pdf](#)) ([bibtex: Acevedo-2006-SQP](#)).
33. Simulation and visualization of topological defects in nematic liquid crystals. A. C. Callan-Jones, Robert A. Pelcovits, Vadim Slavin, Song Zhang, David H. Laidlaw, and George B. Lorient. *Physical Review E*, 74(6), December 2006. ([pdf](#)) ([bibtex: Callan-2006-SVT](#)).
32. Effects of distal radius malunion on distal radioulnar joint mechanics: An in vivo study. Joseph J. Crisco, Douglas Moore, G. Elisabeta Marai, David H. Laidlaw, Edward Akelman, Arnold-Peter C. Weiss, and Scott W. Wolfe. *Journal of Orthopedic Research*, 2006. In Press ([pdf](#)) ([bibtex: Crisco-2006-MDR](#)).
31. Neuroimaging of white matter in aging and dementia. Paul Malloy, Stephen Correia,

- Glenn Stebbins, and David H. Laidlaw. *The Clinical Neuropsychologist: Special Issue on New Technologies, Invited Manuscript*, 2006. ([pdf](#)) ([bibtex: Malloy-2006-NWM](#)).
30. Super-resolution registration using tissue-classified distance fields. G. Elisabeta Marai, David H. Laidlaw, and Joseph J. Crisco. *IEEE Transactions on Medical Imaging*, 25(2):177–187, 2006. ([pdf](#)) ([bibtex: Marai-2006-SRR](#)).
29. Techniques for the visualization of topological defect behavior in nematic liquid crystals. Vadim Slavin, Robert A. Pelcovitz, George Loriot, Andrew Callan-Jones, and David H. Laidlaw. *IEEE Transactions on Visualization and Computer Graphics (Proceedings Visualization / Information Visualization)*, 12(5), September-October 2006. In Press ([pdf](#)) ([bibtex: Slavin-2006-TVT](#)).
28. Identification of fibers at risk for degeneration by diffusion tractography in patients at high risk for MS after a clinically isolated syndrome. Jack H. Simon, Song Zhang, David H. Laidlaw, David E. Miller, Mark Brown, John Corboy, and Jeffrey Bennett. *Journal of Magnetic Resonance Imaging*, October 2006. ([pdf](#)) ([bibtex: Simon-2006-IFR](#)).
27. Cave and fishtank virtual-reality displays: A qualitative and quantitative comparison. Cagatay Demiralp, Cullen Jackson, David Karelitz, Song Zhang, and David H. Laidlaw. *IEEE Transactions on Visualization and Computer Graphics*, 12(3):323–330, May 2006. ([pdf](#)) ([bibtex: Demiralp-2006-CFV](#)).
26. Anatomical analysis of an aye-aye brain (*daubentonia madagascariensis*, primates: Prosimii) combining histology, structural magnetic resonance imaging, and diffusion-tensor imaging. Jason A. Kaufman, Eric T. Ahrens, David H. Laidlaw, Song Zhang, and John M. Allman. *Anatomical Record*, 287A(1):1026–1037, November 2005. ([pdf](#)) ([bibtex: Kaufman-2005-AAA](#)).
25. Artistic collaboration in designing VR visualizations. Daniel Keefe, David Karelitz, Eileen Vote, and David H. Laidlaw. *IEEE Computer Graphics and Applications*, 25(2):18–23, March/April 2005. ([pdf](#)) ([bibtex: Keefe-2005-ACD](#)).
24. Comparing 2D vector field visualization methods: A user study. David H. Laidlaw, Michael Kirby, Cullen Jackson, J. Scott Davidson, Timothy Miller, Marco DaSilva, William Warren, and Michael Tarr. *In IEEE Transactions on Visualization and Computer Graphics*, 11(1):59–70, January-February 2005. ([pdf](#)) ([bibtex: Laidlaw-2005-CVF](#)).
23. Combined effects of pulsatile flow and dynamic curvature on wall shear stress in a coronary artery bifurcation model. Igor Pivkin, Peter Richardson, David H. Laidlaw, and George Karniadakis. *Journal of Biomechanics*, 38(6):1283–1290, 2005. ([pdf](#)) ([bibtex: Pivkin-2005-CEP](#)).
22. Interactive volume rendering of thin thread structures within multivalued scientific datasets. Andreas Wenger, Daniel Keefe, Song Zhang, and David H. Laidlaw. *IEEE Transactions on Visualization and Computer Graphics*, 10(6):664–672, November/December 2004. ([pdf](#)) ([bibtex: Wenger-2004-IVR](#)).
21. Particle flurries: Synoptic 3D pulsatile flow visualization. Jason Sobel, Andrew Forsberg, David H. Laidlaw, Robert Zeleznik, Daniel Keefe, Igor Pivkin, George Karniadakis, Peter Richardson, and Sharon Swartz. *IEEE Computer Graphics and Applications*, 24(2):76–85, March/April 2004. ([pdf](#)) ([bibtex: Sobel-2004-PFC](#)).

20. Visualization and analysis of white matter structural asymmetry in diffusion tensor MR imaging data. Song Zhang, Mark Bastin, David H. Laidlaw, Saurabh Sinha, Paul A. Armitage, and Thomas S. Deisboeck. *Magnetic Resonance in Medicine*, 51(1):140–147, 2004. ([pdf](#)) ([bibtex: Zhang-2004-VAW](#)).
19. Estimating joint contact areas and ligament lengths from bone kinematics and surfaces. G. Elisabeta Marai, David H. Laidlaw, Cagatay Demiralp, Stuart Andrews, Cindy Grimm, and Joseph J. Crisco. *IEEE Transactions on Biomedical Engineering*, 51(5):790–799, May 2003. ([pdf](#)) ([bibtex: Marai-2003-EJC](#)).
18. User studies: Why, how, and when. Robert Kosara, Christopher G. Healey, Victoria Interrante, David H. Laidlaw, and Colin Ware. *Computer Graphics and Applications*, 23(4):20–25, July/August 2003. ([pdf](#)) ([bibtex: Kosara-2003-TUS](#)).
17. Visualizing diffusion tensor MR images using streamtubes and streamsurfaces. Song Zhang, Cagatay Demiralp, and David H. Laidlaw. *IEEE Transactions on Visualization and Computer Graphics*, 9(4):454–462, October 2003. ([pdf](#)) ([bibtex: Zhang-2003-VDT](#)).
16. Discovering Petra: Archaeological analysis in VR. Eileen Vote, Daniel Acevedo, David H. Laidlaw, and Martha Joukowsky. *IEEE Computer Graphics and Applications*, 22(5):38–50, September/October 2002. ([pdf](#)) ([bibtex: Vote-2002-DPA](#)).
15. Experiments in immersive virtual reality for scientific visualization. Andries van Dam, David H. Laidlaw, and Rosemary Michelle Simpson. *Computers and Graphics*, 26(4):535–555, August 2002. ([pdf](#)) ([bibtex: vanDam-2002-EIV](#)).
14. Fitting manifold surfaces to 3D point clouds. Cindy Grimm, Joseph J. Crisco, and David H. Laidlaw. *Journal of Biomechanical Engineering*, 124(1):136–140, February 2002. ([pdf](#)) ([bibtex: Grimm-2002-FMS](#)).
13. Loose, artistic “textures” for visualization. David H. Laidlaw. *IEEE Computer Graphics and Applications*, 21(2):6–9, March/April 2001. ([pdf](#)) ([bibtex: Laidlaw-2001-LAT](#)).
12. Three-dimensional time-resolved (4D) relative pressure mapping using magnetic resonance imaging. J. Michael Tyszka, David H. Laidlaw, Joseph W. Asa, Jeffrey, and M. Silverman. *Journal of Magnetic Resonance Imaging*, 12(2):321–329, August 2000. ([pdf](#)) ([bibtex: Tyszka-2000-TTR](#)).
11. Immersive VR for scientific visualization: A progress report. Andries van Dam, Andrew Forsberg, David H. Laidlaw, Joseph LaViola, and Rosemary Michelle Simpson. *IEEE Computer Graphics and Applications*, 20(6):26–52, November/December 2000. ([pdf](#)) ([bibtex: vanDam-2000-IVR](#)).
10. Towards a microMRI atlas of mouse development. Russell E. Jacobs, Eric T. Ahrens, Mary E Dickinson, and David H. Laidlaw. *Computerized Medical Imaging and Graphics*, 23(1):15–24, January-February 1999. ([pdf](#)) ([bibtex: Jacobs-1999-TMA](#)).
9. Partial-volume Bayesian classification of material mixtures in MR volume data using voxel histograms. David H. Laidlaw, Kurt W. Fleischer, and Alan H. Barr. *IEEE Transactions on Medical Imaging*. Also reprinted in *2000 yearbook of Medical Informatics, International Medical Informatics Assoc., Shattauer, 2000.*, 17(1):74–86, February 1998. ([pdf](#)) ([bibtex: Laidlaw-1998-PVB](#)).

8. On the optimality of partial volume classification methods: Voxel histogram classification vs. eigenimage filtering. David H. Laidlaw. *IEEE Transactions on Medical Imaging*, 17(6):1094–1096, December 1998. ([pdf](#)) ([bibtex: Laidlaw-1998-OPV](#)).
7. MR microscopy of transgenic mice that spontaneously acquire experimental allergic encephalomyelitis. Eric T. Ahrens, David H. Laidlaw, Carol Readhead, Celia F. Brosnan, and Scott E. Fraser. *Magnetic Resonance in Medicine*, 40(1):119–132, July 1998. ([pdf](#)) ([bibtex: Ahrens-1998-MMT](#)).
6. Relative pressure mapping using high-speed three-dimensional phase contrast cine MR imaging. J. Michael Tyszka, David H. Laidlaw, and J. M. Silverman. *Radiology* 205, *Suppl. S*, November 1997. ([bibtex: Tyszka-1997-RPM](#)).
5. Cellular texture generation. Kurt W. Fleischer, David H. Laidlaw, Bena L. Currin, and Alan H. Barr. *Proceedings of SIGGRAPH, Computer Graphics*, 29(4):239–248, August 1995. ([pdf](#)) ([bibtex: Fleischer-1995-CTG](#)).
4. Pure phase-encoded MRI and classification of solids. Pratik Ghosh, David H. Laidlaw, Kurt W. Fleischer, Alan Barr, and Russell E. Jacobs. *IEEE Transactions on Medical Imaging*, 14(3):608–615, 1995. ([pdf](#)) ([bibtex: Ghosh-1995-PPM](#)).
3. The application visualization system: A computational environment for scientific visualization. Craig Upson, Thomas Faulhaber Jr., David Kamins, David H. Laidlaw, David Schlegel, Jeffrey Vroom, Robert Gurwitz, and Andries van Dam. *IEEE Computer Graphics and Applications*, 9(4):30–42, July 1989. ([pdf](#)) ([bibtex: Upson-1989-AVS](#)).
2. Constructive solid geometry for polyhedral objects. David H. Laidlaw, W. Benjamin Trumbore, and John F. Hughes. In *SIGGRAPH*, pages 161–170, August 1986. ([pdf](#)) ([bibtex: Laidlaw-1986-CSG](#)).
1. Topology and mechanics with computer graphics: Linear Hamiltonian systems in four dimensions. Huseyin Kocak, Frederic Bisshopp, Thomas Banchoff, and David H. Laidlaw. *Advances in Applied Mathematics*, 7(3):282–308, 1986. ([bibtex: Kocak-1986-TMC](#)).

**Peer-reviewed
Conference**

- Papers**
26. Using Boy’s real projective plane immersion for coloring DT-MRI slices. Cagatay Demiralp, John F. Hughes, and David H. Laidlaw. In *Proceedings of ISMRM*, 2008. ([bibtex: Demiralp-2008-UBR](#)).
 25. Slicing-based coherence measure for refining clusters of 3D curves. Cagatay Demiralp, Gregory Shakhnarovich, Song Zhang, and David H. Laidlaw. In *Proceedings of MICCAI*, 2008. ([bibtex: Demiralp-2008-SCM](#)).
 24. Tech-note: Dynamic dragging for input of 3D trajectories. Daniel Keefe, Robert Zeleznik, and David H. Laidlaw. In *IEEE Symposium on 3D User Interfaces*, 2008. ([pdf](#)) ([bibtex: Keefe-2008-TDD](#)).
 23. Connectivity-aware sectional visualization of 3D DTI volumes using perceptual flat-torus coloring and edge rendering. Cagatay Demiralp, Song Zhang, David Tate, Stephen Correia, and David H. Laidlaw. In *Proceedings of Eurographics*, 2006. ([pdf](#)) ([bibtex: Demiralp-2006-CSV](#)).

22. Blood flow at arterial branches: Complexities to resolve for the angioplasty suite. Peter Richardson, Igor Pivkin, George Karniadakis, and David H. Laidlaw. In *Proceedings of International Conference of Computational Science. Workshop on Dynamic Data Driven Application Systems. Lecture Notes in Computer Science 3993*, pages 538–545, Reading, UK, May 2006. Springer-Verlag. ([pdf](#)) ([bibtex: Richardson-2006-BFA](#)).
21. Markerless inter-subject bone shape matching using 2D projections. G. Elisabeta Marai and David H. Laidlaw. In *MICCAI 2005 short papers*, 2005. ([pdf](#)) ([bibtex: Marai-2005-MIS](#)).
20. Simulation and visualization of air flow around bat wings during flight. Igor Pivkin, Eduardo Hueso, Rachel Weinstein, David H. Laidlaw, Sharon Swartz, and George Karniadakis. In *Proceedings of International Conference on Computational Science*, pages 689–694, 2005. ([pdf](#)) ([bibtex: Pivkin-2005-SVA](#)).
19. Characterizing the effect of level of immersion on a 3D marking task. Jrgen Schulze, Andrew Forsberg, Kleppe, Robert Zeleznik, and David H. Laidlaw. In *Proceedings of HCI International*, Las Vegas, NE, July 2005. ([pdf](#)) ([bibtex: Schulze-2005-CTE](#)).
18. Color rapid prototyping for diffusion tensor MRI visualization. Daniel Acevedo, Song Zhang, David H. Laidlaw, and Chris Bull. In *Proceedings of MICCAI 2004 Short Papers*, September 2004. ([pdf](#)) ([bibtex: Acevedo-2004-CRP](#)).
17. A model for some subcortical DTI planar and linear anisotropy, Song Zhang and David H. Laidlaw. MICCAI 2004, September 2004. ([pdf](#)) ([bibtex: Zhang-2004-MSS](#)).
16. A synoptic visualization of fully polarimetric SAR data: an annotated example. Dean Turner, Iain Woodhouse, and David H. Laidlaw. In *Proceedings of IEEE IGARSS*, 2002. ([pdf](#)) ([bibtex: Turner-2002-SVF](#)).
15. Improving the visualization of polarimetric response in SAR images: from pixels to images. Iain Woodhouse, Dean Turner, and David H. Laidlaw. In *Proceedings of IEEE IGARSS*, 2002. ([pdf](#)) ([bibtex: Woodhouse-2002-IVP](#)).
14. Toward a framework for assembling broken pottery vessels. Stuart Andrews and David H. Laidlaw. In *Proceedings of the 18th National Conference on Artificial Intelligence*, pages 945–946, July/August 2002. ([pdf](#)) ([bibtex: Andrews-2002-TFA](#)).
13. Bayesian virtual pot-assembly from fragments as problems in perceptual-grouping and geometric-learning. David B. Cooper, Andrew Willis, Stuart Andrews, Jill Baker, Yan Cao, Dongjin Han, Kongbin Kang, Weixin Kong, Frederic Leymarie, Xavier Orriols, Senem Velipasalar, Eileen Vote, Martha Joukowsky, Benjamin B. Kimia, David H. Laidlaw, and David Mumford. In *Proceedings of ICPR*, pages 297–302, 2002. ([pdf](#)) ([bibtex: Cooper-2002-BVP](#)).
12. Assembling virtual pots from 3D measurements of their fragments. David B. Cooper, Andrew Willis, Stuart Andrews, Jill Baker, Yan Cao, Dongjin Han, Kongbin Kang, Weixin Kong, Frederic Leymarie, Xavier Orriols, Eileen Vote, Martha Joukowsky, Benjamin B. Kimia, David H. Laidlaw, David Mumford, and Senem Velipasalar. In *Proceedings of VAST*, 2001. ([pdf](#)) ([bibtex: Cooper-2001-AVP](#)).
11. Quantitative comparative evaluation of 2D vector field visualization methods. David H. Laidlaw, Michael Kirby, J. Scott Davidson, Timothy Miller, Marco DaSilva, William War-

- ren, and Michael Tarr. In *Proceedings of IEEE Visualization 2001*, pages 143–150. IEEE, October 2001. ([pdf](#)) ([bibtex: Laidlaw-2001-QCE](#)).
10. Toward application of virtual reality to visualization of DT-MRI volumes. Song Zhang, Cagatay Demiralp, Marco DaSilva, Daniel Keefe, David H. Laidlaw, Benjamin D. Greenberg, Peter J. Basser, Carlo Pierpaoli, E.A. Chiocca, and T. S. Diesboeck. In *Proceedings MICCAI*, October 2001. ([pdf](#)) ([bibtex: Zhang-2001-TAV](#)).
9. Archaeological data visualization in VR: Analysis of lamp finds at the Great Temple of Petra, a case study. Daniel Acevedo, Eileen Vote, David H. Laidlaw, and Martha Joukowsky. In *Proceedings IEEE Visualization 2001 (BEST CASE-STUDY AWARD)*, pages 493–496, October 2001. ([pdf](#)) ([bibtex: Acevedo-2001-ADV](#)).
8. An immersive virtual environment for DT-MRI volume visualization applications: a case study. Song Zhang, Cagatay Demiralp, Daniel Keefe, Marco DaSilva, Benjamin D. Greenberg, Peter J. Basser, Carlo Pierpaoli, E. A. Chiocca, T. S. Deisboeck, and David H. Laidlaw. In *Proceedings of IEEE Visualization 2001*, pages 437–440, October 2001. ([pdf](#)) ([bibtex: Zhang-2001-IVE](#)).
7. Cavepainting: A fully immersive 3D artistic medium and interactive experience. Daniel Keefe, Daniel Acevedo, Tomer Moscovich, David H. Laidlaw, and Joseph LaViola. In *Proceedings of ACM Symposium on Interactive 3D Graphics*, pages 85–93, March 2001. ([pdf](#)) ([bibtex: Keefe-2001-CPF](#)).
6. Immersive virtual reality for visualizing flow through an artery. Andrew Forsberg, Michael Kirby, David H. Laidlaw, George Karniadakis, Andries van Dam, and Jonathan L. Elion. In *Proceedings of IEEE Visualization 2000*, pages 457–460. IEEE Computer Society Press, October 2000. ([pdf](#)) ([bibtex: Forsberg-2000-IVR](#)).
5. Archave: A virtual environment for archaeological research. Eileen Vote, Daniel Acevedo, David H. Laidlaw, and Martha Joukowsky. In *Proceedings of Computer Applications in Archaeology 2000*, BAR International Series 931, pages 313–316, Oxford, England, April 2000. Archaeopress. ([pdf](#)) ([bibtex: Vote-2000-AAV](#)).
4. The SHAPE lab — new technology and software for archaeologists. Frederic Leymarie, David Cooper, Martha Joukowsky, Benjamin Kimia, David H. Laidlaw, David Mumford, and Eileen Vote. In *Proceedings of Computer Applications in Archaeology 2000*, BAR International Series 931, pages 79–89, Oxford, England, April 2000. Archaeopress. ([pdf](#)) ([bibtex: Leymarie-2000-SLN](#)).
3. Visualizing multivalued data from 2D incompressible flows using concepts from painting. Michael Kirby, H. Marmanis, and David H. Laidlaw. In *Proceedings of IEEE Visualization 1999*, pages 333–340, 1999. ([pdf](#)) ([bibtex: Kirby-1999-VMD](#)).
2. Visualizing diffusion tensor images of the mouse spinal cord. David H. Laidlaw, Eric T. Ahrens, davidkremers, Matthew J. Avalos, Carol Readhead, and Russell E. Jacobs. In *Proceedings of IEEE Visualization 1998*, pages 127–134. IEEE Computer Society Press, October 1998. ([pdf](#)) ([bibtex: Laidlaw-1998-VDT](#)).
1. Registration and computational staining of multiple MRI data sets. David B. Kirk, David H. Laidlaw, and Alan H. Barr. In *Proceedings of AUSGRAPH 1990*, September 1990. ([bibtex: Kirk-1990-RCS](#)).

Book Chapters 7. *Virtual Reality-Based Interactive Scientific Visualization Environments*. Joseph LaVio-
ola, Andrew Forsberg, David H. Laidlaw, and Andries van Dam, chapter 10, pages 225–250.
Springer-Verlag London Limited 2008, 2008.

6. An introduction to visualization of diffusion tensor imaging and its applications. A. Vi-
lanova, Song Zhang, G. Kindlmann, and David H. Laidlaw. In *Visualization and Image
Processing of Tensor Fields*. Springer-Verlag, 2005. ([pdf](#)) ([bibtex: Vilanova-2005-IVD](#)).

5. Painting and visualization. Michael Kirby, Daniel Keefe, and David H. Laidlaw. In
Visualization Handbook. Academic Press, June 2004. ([pdf](#)) ([bibtex: Kirby-2004-PAV](#)).

4. Diffusion tensor MRI visualization. Song Zhang, Gordon Kindlmann, and David H.
Laidlaw. In *Visualization Handbook*. Academic Press, June 2004. ([pdf](#)) ([bibtex:
Zhang-2004-DTM](#)).

3. Partial-volume Bayesian classification with voxel histograms. David H. Laidlaw, Kurt
Fleischer, and Alan Barr. In *Handbook of Medical Image Processing*, pages 195–211. Aca-
demic Press, 2001. ([pdf](#)) ([bibtex: Laidlaw-2001-PVB](#)).

2. Continuous Bayesian tissue classification for visualization techniques. David H. Laidlaw.
In *Data Visualization Techniques*, pages 107–129. John Wiley and Sons Ltd, 1999. ([pdf](#))
([bibtex: Laidlaw-1999-CBT](#)).

1. Goal-directed magnetic resonance brain micro-imaging. David H. Laidlaw, Alan M.
Barr, and Russell E. Jacobs. In *Neuroinformatics: An Overview of the Human Brain
Project*, chapter 6, pages 125–202. Lawrence Erlbaum Assoc., 1997. ([bibtex: Laid-
law-1997-GDM](#)).

Patents Quantitative Tract-of-Interest Metrics for White Matter Integrity Based on Diffusion Ten-
sor MRI Data, David H. Laidlaw, Stephanie Y. Lee, Stephen Correia, provisional filing
60/852,922, filed 2007.

Method, Apparatus and Computer Program Product for the Interactive Rendering of Mul-
tivalued Volume Data with Layered Complementary Values, David H. Laidlaw, Andreas
Wenger, US Patent 7,355,597, April 8, 2008.

Conference Abstracts and

Posters 87. Superior longitudinal fasciculus and working memory in CADASIL. S Epstein,
Stephen Correia, A. MacKay-Brandt, David H. Laidlaw, Paul Malloy, and Steven Salloway.
INS, 2008. ([pdf](#)) ([doc](#)) ([bibtex: Epstein-2008-SLF](#)).

86. Exploring dimensionality reduction of animal flight kinematics in an interactive virtual
reality setting, Mykhaylo Kostandov, Jian Chen, Igor Pivkin, Sharon Swartz, and David H.
Laidlaw. ACM I3D Symposium on Interactive 3D Graphics and Games, Posters Program,
February 2008. ([pdf](#)) ([bibtex: Kostandov-2008-EDR](#)).

85. A case study in using gestures and bimanual interaction to overload a high-dof input
device, Trevor O’Brien, Daniel Keefe, and David H. Laidlaw. ACM I3D Symposium on
Interactive 3D Graphics and Games, Posters, February 2008. ([bibtex: OBrien-2008-CSU](#)).

84. Grey and white matter changes on MRI and diffusion-tensor imaging and cognitive
function in mild cognitive impairment. K. Patel, Stephen Correia, J. Foley, E. Schlichting,

- Song Zhang, David H. Laidlaw, and Steven Salloway. *INS*, February 2008. Unknown ([doc](#)) ([bibtex: Patel-2008-GWM](#)).
83. Longitudinal tracking and quantification of T cells using in vivo 19F MRI. M. Srinivas, M. S. Turner, P. A. Morel, J. M. Janjic, David H. Laidlaw, and Eric T. Ahrens. In *Proceedings of International Society for Magnetic Resonance and Medicine*, 2008. In Review ([pdf](#)) ([bibtex: Srinivas-2008-LTQ](#)).
82. Modeling perceptual dominance among visual cues in multilayered icon-based scientific visualizations, Daniel Acevedo, Jian Chen, and David H. Laidlaw. *IEEE Visualization'07, Poster Compendium*, 2007. ([pdf](#)) ([bibtex: Acevedo-2007-MPD](#)).
81. Interactive multiple scale small multiples, Jian Chen, Andrew Forsberg, Sharon Swartz, and David H. Laidlaw. *IEEE Visualization 2007 Poster Compendium*, November 2007. ([pdf](#)) ([bibtex: Chen-2007-MSM](#)).
80. The effect of using large, high-resolution stereoscopic displays for flow visualization. Jian Chen, Andrew Forsberg, Mykhaylo Kostandov, Dave Willis, and David H. Laidlaw. In *Proceedings of SIGGRAPH poster*, 2007. ([pdf](#)) ([bibtex: Chen-2007-DSF](#)).
79. Getting human-centered computing and scientific visualization married: the myth and critical issues, Jian Chen, Victoria Interrante, William Ribarsky, and David H. Laidlaw. *IEEE Visualization Panel*, Oct 2007. ([pdf](#)) ([bibtex: Chen-2007-HVP](#)).
78. Fine-grained comparison of anisotropy differences between groups of white matter tracts. J. D. Clayden, Song Zhang, Stephen Correia, and David H. Laidlaw. In *Proceedings of ISMRM*, 2007. ([pdf](#)) ([bibtex: Clayden-2007-FCA](#)).
77. Visualizing spatial relations between 3D-DTI integral curves using texture patterns. Doria Jianu, Wenjin Zhou, Cagatay Demiralp, and David H. Laidlaw. In *IEEE Visualization Poster Compendium*, 2007. ([pdf](#)) ([bibtex: Jianu-2007-VSR](#)).
76. Analysis of performance in precise 3D curve input tasks in virtual reality, Daniel Keefe and David H. Laidlaw. *IEEE Visualization 2007 Poster*, 2007. ([pdf](#)) ([bibtex: Keefe-2007-APP](#)).
75. Quantitative tract of interest metrics for white matter integrity based on diffusion tensor MRI data. David H. Laidlaw, Stephanie Lee, Stephen Correia, David Tate, Robert Paul, Song Zhang, Steven Salloway, and Paul Malloy. *Views Radiology*, 8(4):2–4, 2007. ([pdf](#)) ([bibtex: Laidlaw-2007-QTI](#)).
74. Cognitive impairment, hippocampal volume, and white matter integrity in CADASIL. K. Patel, Stephen Correia, J. Foley, E. Schlichting, Song Zhang, David H. Laidlaw, and Steven Salloway. In *Proceedings of INS*, 2007. ([bibtex: Patel-2007-CIH](#)).
73. Fluorine-19 MRI for visualization and quantification of cell migration in a diabetes model, Mangala Srinivas, Penelope A. Morel, Lauren A. Ernst, David H. Laidlaw, and Eric T. Ahrens. *Poster at ISMRM*, 2007. ([pdf](#)) ([bibtex: Srinivas-2007-FVQ](#)).
72. Template-based automatic dti fiber bundle labeling. Song Zhang, Stephen Correia, and David H. Laidlaw. In *Proceedings of ISMRM*, 2007. ([pdf](#)) ([bibtex: Zhang-2007-TAD](#)).
71. Diffusion-tensor MRI tractography methods for assessing white matter health and its relationship to cognitive functioning. Stephen Correia, Stephanie Lee, Paul Malloy,

Neil Mehta, Song Zhang, Steven Salloway, and David H. Laidlaw. In *Proceedings of the International Neurophysiological Society*, Boston, February 2006. ([doc](#)) ([bibtex: Correia-2006-DTM](#)).

70. Diffusion-tensor imaging tractography: Correlation with processing speed in aging. Stephen Correia, Stephanie Lee, Song Zhang, Paul Malloy, Steven Salloway, and David H. Laidlaw. In *Abstracts Proceedings of 10th International Conference on Alzheimer's Disease and Related Disorders (BEST POSTER AWARD)*, pages Abstract P2–270, 2006. ([ppt](#)) ([bibtex: Correia-2006-DTI](#)).

69. Proper orthogonal decomposition and particle image velocimetry in bat flight, Mykhaylo Kostandov, Igor Pivkin, Kenneth Breuer, Sharon Swartz, and David H. Laidlaw. IEEE Visualization 2006 Poster Compendium, November 2006. ([pdf](#)) ([bibtex: Kostandov-2006-POD](#)).

68. Visualizing phosphorylation experiments data in the context of known protein interactions, Radu Jianu, David H. Laidlaw, and Arthur Salomon. IEEE Visualization Poster Compendium, 2006. ([pdf](#)) ([bibtex: Jianu-2006-PED](#)).

67. Quantitative tract-of-interest metrics for white-matter integrity based on diffusion tensor MRI data. Stephanie Lee, Stephen Correia, David Tate, Robert Paul, Song Zhang, Steven Salloway, Paul Malloy, and David H. Laidlaw. In *Proceedings International Society for Magnetic Resonance in Medicine (ISMRM)*, 2006. ([pdf](#)) ([bibtex: Lee-2006-QTM](#)).

66. A kinematics-based method for generating cartilage maps and deformations in the multi-articulating wrist joint from ct images. G. Elisabeta Marai, Joseph Crisco, and David H. Laidlaw. In *Proceedings of the IEEE International Conference of the Engineering in Medicine and Biology Society (EMBS)*, New York, NY, September 2006. ([pdf](#)) ([bibtex: Marai-2006-AKB](#)).

65. Altered diffusion scalar metrics in the midsagittal corpus callosum are associated with cognition among HIV patients. David Tate, Robert Paul, Kathryn Coop, Timothy Flanigan, Song Zhang, David H. Laidlaw, and Karen Tashima. In *Proceedings of the 14th Conference on Retroviruses and Opportunistic Infections*, Los Angeles, CA, 2006. ([html](#)) ([bibtex: Tate-2006-ADS](#)).

64. Correlating DTI fiber clusters with white-matter anatomy. Song Zhang, Stephen Correia, David F. Tate, and David H. Laidlaw. In *Proceedings International Society for Magnetic Resonance in Medicine (ISMRM)*, 2006. ([pdf](#)) ([bibtex: Zhang-2006-CDC](#)).

63. Sampling DTI integral curves based on DWI forward modeling. Song Zhang and David H. Laidlaw. In *Proceedings of the IEEE International Conference of the Engineering in Medicine and Biology Society (EMBS)*, New York, NY, August-September 2006. In Press ([pdf](#)) ([bibtex: Zhang-2006-SDI](#)).

62. Perceptual coloring and 2D sketching for segmentation of neural pathways, Wenjin Zhou, Peter G. Sibley, Song Zhang, David Tate, and David H. Laidlaw. Siggraph 2006, Poster Compendium (BEST POSTER AWARD), August 2006. ([pdf](#)) ([bibtex: Zhou-2006-PCS](#)).

61. Using visual design expertise to characterize the effectiveness of 2D scientific visualization methods. Daniel Acevedo, Cullen Jackson, David H. Laidlaw, and Fritz Drury. In

Proceedings IEEE Visualization, Poster Compendium (BEST POSTER AWARD), October 2005. ([pdf](#)) ([bibtex: Acevedo-2005-UVD](#)).

60. Diffusion-tensor imaging and executive function in subcortical ischemic vascular disease and mild cognitive impairment. Stephen Correia, Thea Brennan-Krohn, Song Zhang, David H. Laidlaw, Paul Malloy, and Steven Salloway. In *International Neuropsychological Society conference*, February 2005. ([ppt](#)) ([bibtex: Correia-2005-DTI](#)).

59. Diffusion-tensor imaging in vascular cognitive impairment and mild cognitive impairment: relationship with executive functioning. Stephen Correia, Thea Brennan-Krohn, Erin Schlichting, Song Zhang, David H. Laidlaw, Paul Malloy, and Steven Salloway. In *Proceedings of the 2nd Congress of the International Society for Vascular, Cognitive and Behavioural Disorders*, Florence, Italy, June 2005. ([pdf](#)) ([bibtex: Correia-2005-DTV](#)).

58. Panel: Design and evaluation in visualization research. Don House, Victoria Interrante, David H. Laidlaw, Russell Taylor, and Colin Ware. In *Proceedings of IEEE Visualization Conference*, Minneapolis, MN, October 2005. ([pdf](#)) ([bibtex: House-2005-DEV](#)).

57. A haptic interface for creating smooth 3D curves with varying line weight. Daniel Keefe and David H. Laidlaw. In *Proceedings SIGGRAPH, Posters Program*, 2005. ([pdf](#)) ([bibtex: Keefe-2005-HIC](#)).

56. Moving research into practice, David H. Laidlaw. Panel Presentation on Homeland Security and Emerging Technology. The Science and Technology Agenda for Visual Analytics: Science and Technology Recommendations, February 2005. ([pdf](#)) ([bibtex: Laidlaw-2005-MRP](#)).

55. Diffusion-tensor imaging: Frontal executive function in vascular cognitive impairment. Steven Salloway, Stephen Correia, Paul Malloy, William Heindel, and David H. Laidlaw. In *Collaborative for Translational Brain Research Symposium*, April 2005. ([ppt](#)) ([bibtex: Salloway-2005-DTI](#)).

54. Visualization of fibers at risk for neuronal tract degeneration in early MS by streamtube diffusion tractography, Jack H. Simon, John Corboy, Song Zhang, and David H. Laidlaw. Platform Presentation at the Academy of Neurology, Miami, FL, April 2005. ([bibtex: Simon-2005-VFR](#)).

53. Strategy for detecting neuronal fibers at risk for neurodegeneration in earliest MS by streamtube tractography at 3T. Jack H. Simon, Song Zhang, David H. Laidlaw, D. E. Miller, M. Brown, J. Corboy, D. Singel, and J. Bennett. In *Proceedings International Society for Magnetic Resonance in Medicine (ISMRM)*, Miami, FL, May 2005. ([pdf](#)) ([ppt](#)) ([bibtex: Simon-2005-SDN](#)).

52. Fractional anisotropy in subcortical white matter regions of interest among cardiovascular patients. David Tate, J. Gunstad, Robert Paul, Song Zhang, David H. Laidlaw, and Ronald Cohen. In *Proceedings International Society for Magnetic Resonance in Medicine (ISMRM)*, Miami, FL, May 2005. ([ppt](#)) ([bibtex: Tate-2005-FAS](#)).

51. DTI fiber clustering and cross-subject cluster analysis. Song Zhang and David H. Laidlaw. In *Proceedings International Society for Magnetic Resonance in Medicine (ISMRM)*, Miami, FL, May 2005. ([pdf](#)) ([bibtex: Zhang-2005-DFC](#)).

50. Visualization of the interaction of multiple sclerosis lesions with adjacent white matter fibers using streamtubes and streamsurfaces. Song Zhang, Jack H. Simon, David H. Laidlaw, Mark Brown, and David M. Miller. In *IEEE Visualization Poster Compendium*, October 2004. ([pdf](#)) ([bibtex: Zhang-2004-VIM](#)).
49. DTI fiber clustering in the whole brain, Song Zhang and David H. Laidlaw. *IEEE Visualization 2004 Poster Compendium*, October 2004. ([pdf](#)) ([bibtex: Zhang-2004-DFC](#)).
48. Towards a global tractography-based model of FA. Song Zhang and David H. Laidlaw. In *Workshop on aging connections: Advanced MRI of age related white matter changes in the brain*. ISMRM, 2004. ([pdf](#)) ([bibtex: Zhang-2004-TGT](#)).
47. Comparative 3D anatomy of the prosimian brain:DTI and histological studies. Eric T. Ahrens, J.M.Allman, E.Bush, David H. Laidlaw, and Song Zhang. In *Proceedings of the Scientific Meeting and Exhibition of the International Society for Magnetic Resonance in Medicine*, 2004. ([pdf](#)) ([bibtex: Ahrens-2004-CAP](#)).
46. Diffusion-tensor imaging and executive function in subcortical vascular disease. Thea Brennan-Krohn, Stephen Correia, Song Zhang, David H. Laidlaw, Paul Malloy, and Steven Salloway. In *Workshop on aging connections: Advanced MRI of age related white matter changes in the brain*. ISMRM, 2004. ([bibtex: Brennan-2004-DTI](#)).
45. Panel: In the eye of the beholder: The role of perception in scientific visualization. Kelly Gaither, Bill Geisler, David H. Laidlaw, and David Ebert. In *Proceedings of IEEE Visualization Conference*, pages 567–568, October 10 - 15 2004. ([pdf](#)) ([bibtex: Gaither-2004-IEB](#)).
44. What should we teach in a scientific visualization class?, Jon Genetti, Mike Bailey, David H. Laidlaw, Robert Moorhead, and Ross Whitaker. Panel in *IEEE Visualization 2004*, October 2004. ([bibtex: Genetti-2004-WSW](#)).
43. Diffusion-tensor imaging: linear, planar, and spherical diffusion in CADASIL. Steve Correia, Song Zhang, David H. Laidlaw, Paul Malloy, and Steven Salloway. In *9th International Conference on Alzheimer's Disease and Related Disorders*, 2004. ([bibtex: Correia-2004-DTI](#)).
42. Diffusion-tensor imaging and executive function in subcortical ischemic vascular disease and mild cognitive impairment. Stephen Correia, Thea Brennan-Krohn, Song Zhang, David H. Laidlaw, Paul Malloy, and Steven Salloway. In *Proceedings of the International Neurophysiological Society*, 2004. ([pdf](#)) ([doc](#)) ([bibtex: Correia-2004-DIE](#)).
41. Ramifications of isotropic sampling and acquisition orientation on DTI analyses. David H. Laidlaw, Song Zhang, Mark Bastin, Stephen Correia, Steven Salloway, and Paul Malloy. In *Proceedings of the Scientific Meeting and Exhibition of the International Society for Magnetic Resonance in Medicine*, 2004. ([pdf](#)) ([bibtex: Laidlaw-2004-RIS](#)).
40. Visualization of vortices in simulated airflow around bat wings during flight, Eduardo Hueso, Igor Pivkin, Sharon Swartz, David H. Laidlaw, George Karniadakis, and Kenneth Breuer. *IEEE Visualization 2004 Poster Compendium*, October 2004. ([pdf](#)) ([ppz](#)) ([zip](#)) ([bibtex: Hueso-2004-VVS](#)).
39. Applying lessons from visual art to exploration of the brain, David H. Laidlaw, david-

- kremers, A.W. Toga, Fritz Drury, and Russell E. Jacobs. Panel in Thirty-Seventh Annual Winter Conference on Brain Research, January 2004. ([pdf](#)) ([bibtex: Laidlaw-2004-ALV](#)).
38. Visualization of topological defects in nematic liquid crystals using streamtubes, streamsurfaces and ellipsoids, Vadim Slavin, David H. Laidlaw, Song Zhang, Roberth Pelcovits, George Loriot, and Anderw Callan-Jones. IEEE Visualization 2004 Poster Compendium, October 2004. ([pdf](#)) ([ppz](#)) ([zip](#)) ([bibtex: Slavin-2004-VTD](#)).
37. 3D kinematics of flying bats: Challenges of complex multidimensional comparison. Sharon Swartz, Kristin Bishop, Igor Pivkin, George Karniadakis, David H. Laidlaw, Eileen Vote, and Daniel Keefe. In *Seventh International Congress on Vertebrate Morphology*, Boca Raton, Florida, 2004. ([bibtex: Swartz-2004-3DK](#)).
36. Kinematic and mechanical changes in the distal radioulnar joint (DRUJ) of patients with malunited distal radius fractures. Joseph J. Crisco, G. Elisabeta Marai, David H. Laidlaw, Douglas Moore, and E. Akelman. In *49th Annual Meeting of the Orthopaedic Research Society, New Orleans, LA*. Orthopaedic Research Society, February 2003. ([pdf](#)) ([bibtex: Crisco-2003-KMC](#)).
35. Arterial motions and flows seen in virtual reality. Andrew Forsberg, Peter Richardson, Jason Sobel, David H. Laidlaw, Daniel Keefe, Igor Pivkin, and George Karniadakis. In *Proceedings World Congress on Medical Physics and Biomedical Engineering*, Sydney Australia, August 2003. ([bibtex: Forsberg-2003-AMF](#)).
34. Subjective usefulness of CAVE and fish tank VR display systems for a scientific visualization application. Cagatay Demiralp, David H. Laidlaw, Cullen Jackson, Daniel Keefe, and Song Zhang. In *IEEE Visualization Poster Compendium*, Seattle, WA, 2003. ([pdf](#)) ([bibtex: Demiralp-2003-SUC](#)).
33. Computational aspects of paintings, Michael Leyton, Doug DeCarlo, David H. Laidlaw, and Frederic Leymarie. Panel at 2004 SIAM Conference on Geometric Design and Computing, November 2004. ([bibtex: Leyton-2004-CAP](#)).
32. Panel session: Information and scientific visualization: Separate but equal or happy together at last. Theresa-Marie Rhyne, Melanie Tory, Tamara Munzner, Matt Ward, Chris Johnson, and David H. Laidlaw. In *Proceedings of IEEE Visualization'03*, 2003. ([pdf](#)) ([bibtex: Rhyne-2003-ISV](#)).
31. Using CavePainting to create scientific visualizations. David Karelitz, Daniel Keefe, and David H. Laidlaw. In *Proceedings IEEE Visualization, Posters Compendium*, page 109, October 2003. ([pdf](#)) ([bibtex: Karelitz-2003-UCC](#)).
30. The combined effect of pulsatile inflow and unsteady geometry on flow in coronary arteries. Igor Pivkin, Peter Richardson, David H. Laidlaw, and George Karniadakis. In *Proceedings of International Symposium on Modeling of Physiological Flows*, 2003. ([pdf](#)) ([ps](#)) ([bibtex: Pivkin-2003-CEP](#)).
29. Designer-critiqued comparison of 2D vector visualization methods: A pilot study. Cullen Jackson, Daniel Acevedo, David H. Laidlaw, Fritz Drury, Eileen Vote, and Daniel Keefe. In *SIGGRAPH 2003 Sketches and Applications*. ACM SIGGRAPH, 2003. ([pdf](#)) ([bibtex: Jackson-2003-DCC](#)).

28. Design-by-example: A schema for designing visualizations using examples from art. Eileen Vote, Daniel Acevedo, Cullen Jackson, Jason Sobel, and David H. Laidlaw. In *SIGGRAPH 2003 Sketches and Applications*. ACM SIGGRAPH, 2003. ([pdf](#)) ([bibtex: Vote-2003-DBE](#)).
27. A 3D method for segmenting and registering carpal bones from CT volume images. G. Elisabeta Marai, David H. Laidlaw, James J Coburn, Mohammad A Upal, and Joseph J. Crisco. In *Proceedings of Annual Meeting of the American Society of Biomechanics*, September 2003. ([pdf](#)) ([ppt](#)) ([bibtex: Marai-2003-3DM](#)).
26. TIV: A thread interaction viewer. Kevin Audleman, David H. Laidlaw, and Steve Reiss. In *Poster Proceedings of IEEE Visualization*, October 2002. ([pdf](#)) ([ppt](#)) ([bibtex: Audleman-2002-TIV](#)).
25. The great potato search: The effects of visual context on users feature search and recognition abilities in an IVR scene. Cullen Jackson, David Karelitz, Sean A. Cannella, and David H. Laidlaw. In *Poster Proceedings of IEEE Visualization*, October 2002. ([pdf](#)) ([bibtex: Jackson-2002-TGP](#)).
24. Application of DTI visualization and analysis on a data set from a brain tumor patient. Song Zhang, David H. Laidlaw, Mark Bastin, Saurabh Sinha, and Thomas S. Deisboeck. In *IEEE Visualization Poster Compendium*, October 2002. ([pdf](#)) ([bibtex: Zhang-2002-AOD](#)).
23. Visualizing the differences between diffusion tensor volume images. Marco DaSilva, Song Zhang, Cagatay Demiralp, and David H. Laidlaw. In *Proceedings ISMRM Workshop in Diffusion MRI: Biophysical Issues*, pages 237–238, March 2002. ([pdf](#)) ([bibtex: DaSilva-2002-VDD](#)).
22. Contact areas and ligament lengths are abnormal in patients with malunited distal radius fracture despite normal radioulnar kinematics. G. Elisabeta Marai, David H. Laidlaw, Cagatay Demiralp, Cindy Grimm, Joseph J. Crisco, Douglas Moore, and E. Akelman. In *World Congress Biomechanics*, 2002. ([pdf](#)) ([bibtex: Marai-2002-CAA](#)).
21. Modeling and visualization of inter-bone distances in joints. Cagatay Demiralp, G. Elisabeta Marai, Stuart Andrews, David H. Laidlaw, Joseph J. Crisco, and Cindy Grimm. In *Visualization '01 Work in Progress Proceedings*, pages 24–25, October 2001. ([pdf](#)) ([bibtex: Demiralp-2001-MVI](#)).
20. Visualizing diffusion tensor volume differences. Marco DaSilva, Song Zhang, Cagatay Demiralp, and David H. Laidlaw. In *Visualization '01 Work in Progress Proceedings*, pages 16–17, October 2001. ([pdf](#)) ([bibtex: DaSilva-2001-VDT](#)).
19. Realism, expressionism, and abstraction: Applying art techniques to visualization. Theresa-Marie Rhyne, David H. Laidlaw, Christopher G. Healey, Victoria Interrante, and David Duke. In *Proceedings of IEEE Visualization Conference*, pages 523–526, San Diego, California, October 2001. ([pdf](#)) ([bibtex: Rhyne-2001-REA](#)).
18. Interactive visualization of 3D carpal kinematics and bony anatomy. Joseph J. Crisco, Cagatay Demiralp, David H. Laidlaw, A-P. C. Weiss, E. Akelman, and S.W. Wolfe. In *Am. Soc. for Surgery of the Hand 56th Annual Meeting*, October 2001. ([bibtex: Crisco-2001-IV3](#)).

17. Elucidating neural structure in diffusion tensor MRI volumes using streamtubes and streamsurfaces. Song Zhang and David H. Laidlaw. In *Proc. 9th International Society of MR in Medicine*, April 2001. ([pdf](#)) ([bibtex: Zhang-2001-ENS](#)).
16. Multimodal multidimensional digital developmental atlas of mouse brain. Russell E. Jacobs, David H. Laidlaw, G. Burns, R. Moats, and A. Toga. In *Winter Conference on Brain Research. Panel Session*, January 2001. ([bibtex: Jacobs-2001-MMD](#)).
15. Archave: A virtual environment for archaeological research. Daniel Acevedo, Eileen Vote, David H. Laidlaw, and Martha Joukowsky. In *Work in Progress Proceedings of IEEE Visualization'00*, October 2000. ([pdf](#)) ([bibtex: Acevedo-2000-AVE](#)).
14. What's virtual reality good for? The ARCHAVE system — problems and possibilities. Eileen Vote, Daniel Acevedo, Martha Joukowsky, and David H. Laidlaw. In *Proc. Virtual Archaeology between Scientific Research Territorial Marketing (VAST)*, pages 83–86, November 2000. ([pdf](#)) ([bibtex: Vote-2000-VRS](#)).
13. Streamtubes and streamsurfaces for visualizing diffusion tensor MRI volume images. Song Zhang, Charles T. Curry, Daniel S. Morris, and David H. Laidlaw. In *Visualization '00 Work in Progress*, October 2000. ([pdf](#)) ([bibtex: Zhang-2000-SSV](#)).
12. Visualizing diffusion tensor MR images using streamtubes and streamsurfaces, Song Zhang, Charles T. Curry, Daniel S. Morris, and David H. Laidlaw. Poster at Human Brain Project Annual Meeting, NIH, Bethesda, MD, May 2000. ([pdf](#)) ([bibtex: Zhang-2000-VDT](#)).
11. Reducing errors due to partial-volume effects and noise in pressure maps calculated for MR velocity data. Marco DaSilva, David H. Laidlaw, and J. Michael Tyszka. In *Proc. 8th International Society for MR in Medicine*, April 2000. ([bibtex: DaSilva-2000-RED](#)).
10. Visualization needs more visual design! Sensory design issues as a driving problem for visualization research. J. Edward Swan, Victoria Interrante, David H. Laidlaw, Theresa-Marie Rhyne, and Tamara Munzner. In *Proceedings of IEEE Visualization Conference*, pages 485–490, San Francisco, California, 1999. ([pdf](#)) ([bibtex: Swan-1999-VNM](#)).
9. Evaluating effects of diffusion weighting choice on accuracy of diffusion tensor MRI of fixed mouse spinal cord. David H. Laidlaw, Kristen L. Cook, and Yuri M. Goldfeld. In *Proc. 7th International Society for MR in Medicine, Poster Session*, May 1999. ([pdf](#)) ([bibtex: Laidlaw-1999-EED](#)).
8. A demonstration of errors in relative pressure calculations for MR velocity data. David H. Laidlaw and J. Michael Tyszka. In *Proc. 7th International Society for MR in Medicine*, May 1999. ([pdf](#)) ([bibtex: Laidlaw-1999-DER](#)).
7. Investigating white matter diffusion anisotropy using the desmyelinating shiverer mutant mouse. Eric T. Ahrens, David H. Laidlaw, Carol Readhead, and Scott E. Fraser. In *Proc. 7th International Society for MR in Medicine*, May 1999. ([bibtex: Laidlaw-1999-IWM](#)).
6. Goal-directed optimization of magnetic resonance imaging. David H. Laidlaw, Eric T. Ahrens, Matthew J. Avalos, Mark D. Montague, Alan H. Barr, Russell E. Jacobs, and Scott E. Fraser. In *Neuroscience Abstracts*, November 1998. ([bibtex: Laidlaw-1998-GOM](#)).

5. Panel: Art and visualization: Oil and water? David H. Laidlaw, davidkremers, Felice Frankel, Victoria Interrante, and Thomas F. Banchoff. In *Proceedings of IEEE Visualization Conference*, pages 507–509, Research Triangle Park, North Carolina, October 18 - 23 1998. ([pdf](#)) ([bibtex: Laidlaw-1998-AVO](#)).
4. Visually representing multi-valued scientific data using concepts from oil painting. David H. Laidlaw, davidkremers, Eric T. Ahrens, and Matthew J. Avalos. In *SIGGRAPH '98 Visual Proceedings (sketch)*, page 249, August 1998. ([pdf](#)) ([bibtex: Laidlaw-1998-VRM](#)).
3. Evaluating numerical methods for blood pressure MRI. David H. Laidlaw and J. Michael Tyszka. In *Laverna Titus Young Investigators forum*, May 1998. ([bibtex: Laidlaw-1998-ENM](#)).
2. Three-dimensional space-time structure of turbulent jets. Jerry W. Shan, David H. Laidlaw, Galen G. Gornowicz, Daniel B. Lang, and Paul E. Dimotakis. In *Proc. DFD97 Meeting of the American Physical Society*, November 1997. ([bibtex: Shan-1997-TSS](#)).
1. Bayesian mixture classification of MRI data for geometric modeling and visualization. David H. Laidlaw. In *abstract and poster for International Workshop on Mixtures*, September 1995. ([bibtex: Laidlaw-1995-BMC](#)).

Popular Press

13. Symmetric bat flight, Kosara and Robert. July 2008. ([pdf](#)) ([bibtex: Kosara-2008-SBF](#)).
12. Daniel keefe, cavepainter, Jen Grey. ACM SIGGRAPH Arts, October 2007. ([pdf](#)) ([bibtex: Grey-2007-DKC](#)).
11. Drawing on air with haptics in 3D, Roland Piquepaille. Slashdot.com, September 2007. ([pdf](#)) ([bibtex: Piquepaille-2007-DAH](#)).
10. New tech lets you draw in the air, Tracy Staedter. Discovery News, October 2007. ([pdf](#)) ([bibtex: Staedter-2007-NTL](#)).
9. CSers develop new 3D design tool, Haydar Taygun. Brown Daily Herald, October 2007. ([pdf](#)) ([bibtex: Taygun-2007-CDN](#)).
8. Artists draw on air to create 3D illustrations, Zyga. Online magazine PHYSORG.com, 2007. ([pdf](#)) ([bibtex: Zyga-2007-ADA](#)).
7. Not your typical new magazine: Brown university s chaise is printed on a dvd disc, Bill Van Siclen. Providence Journal Arts Section, February 2004. ([pdf](#)) ([bibtex: Siclen-2004-NYT](#)).
6. Nugget for NSF: ITR collaborative: Perceptual optimization for data visualization, Colin Ware, Don House, David H. Laidlaw, and Jeffrey Proehl. Submitted to NSF, January 2004. ([pdf](#)) ([bibtex: Ware-2004-NUG](#)).
5. Faculty forum: Teaching innovations,, Catherine Dube, David H. Laidlaw, and Thompson Webb III. In *The Teaching Exchange*, Brown University, January 2003. ([pdf](#)) ([bibtex: Dube-2003-FFT](#)).
4. Random samples: Painterly data. Constance Holden. *Science Magazine*, 298(5594):739, October 2002. ([pdf](#)) ([bibtex: Holden-2002-RSA](#)).

3. Brown-risd course unites two disciplines, two institutions. Elizabeth Miller. *George Street Journal*, 27, November 2002. ([pdf](#)) ([bibtex: Miller-2002-BRC](#)).
2. Virtual da vinci. Kathy Walker. *Shift Magazine*, 10(2), May 2002. ([pdf](#)) ([bibtex: Walker-2002-VDV](#)).
1. The virtual voyager. Paroma Basu. *The MIT Technology Review*, September 2001. ([pdf](#)) ([bibtex: Basu-2001-TVV](#)).

Other

Publications

6. Modeling the flight of a bat. David J. Willis. *Science Magazine. 2007 Visualization Challenge Winner. Informational Graphics.*, 317:1860, September 2007. ([pdf](#)) ([bibtex: Willis-2007-MFB](#)).
5. Faculty forum: Teaching innovations,, Catherine Dube, David H. Laidlaw, and Thompson Webb III. In *The Teaching Exchange*, Brown University, January 2003. ([pdf](#)) ([bibtex: Dube-2003-FFT](#)).
4. Nonphotorealistic rendering in scientific visualization. Christopher G. Healey, Victoria Interrante, davidkremers, David H. Laidlaw, and Penny Rheingans. In *Course Notes of SIGGRAPH 2001*, volume Course 32, August 2001. ([pdf](#)) ([bibtex: Healey-2001-NRS](#)).
3. Applying concepts from oil painting and art to visualization. David H. Laidlaw. *Sidebar in IEEE Computer Graphics and Applications*, January 2000. ([bibtex: Laidlaw-2000-ACO](#)).
2. *Geometric Model Extraction from Magnetic Resonance Volume Data*. David H. Laidlaw. PhD thesis, California Institute of Technology, 1995. ([pdf](#)) ([bibtex: Laidlaw-1995-GME](#)).
1. Computer graphics and the geometry of s3. Huseyin Kocak and David H. Laidlaw. *The Mathematical Intelligencer*, 9(1):8–10, 1987. ([bibtex: Kocak-1987-CGG](#)).

Invited Lectures/Presentations

- 2008 IEEE Visualization Capstone, October
- Stowers Institute for Medical Research, October
- RISD Teaching Symposium, April
- Mississippi State University, March
- 2007 Washington University, St. Louis, November
- IEEE Visualization Conference, October
- Visualization Dagstuhl, May
- Tensor Dagstuhl, January
- 2006 IEEE Visualization Conference, October
- 2005 Joint Greater Boston ACM and IEEE Seminar, December

Physical Chemistry Seminar, Brown, November

Biostatistics Seminar, Brown, November

IEEE Visualization Conference, October

Dagstuhl, June

Dynamic Data-Driven Application Systems Workshop, International Conference on Computational Science, Atlanta, May

National Academy of Engineering, German American Frontiers of Engineering Symposium, Potsdam, May

VRVis Seminar, Vienna, May

Image and Meaning II Conference, Los Angeles, June

Visual Analytics Panel, AAAS, Washington DC, February

2004 IEEE Visualization Conference, October

Brown CS 25th Anniversary, May

University of Kaiserslautern, April

Dagstuhl Diffusion Imaging and Visualization Symposium, April

Wayland Collegium, March

Winter Conference on Brain Research, January

2003 SIAM Geometry Conference, November

Imaging 2020 Conference, September

Dagstuhl Visualization Symposium, June

Princeton University, May

Siemens Corporate Research, May

2002 University of New Hampshire, October

Fraunhofer Center for Research in Computer Graphics (CRCG), February

2001 Carnegie Mellon University, November

Brown Inauguration, October

MIT Image and Meaning Conference, June

University of Edinburgh, April

- 2000 NIH Diffusion Tensor Magnetic Resonance Imaging Conference, December
- 1998 NSF Conference on Computing in the Life Sciences, Pomona College, April
Naval Research Lab, May
Brown University Computer Science, April
University of Southern California, April
- 1997 NSF Science and Technology Center for Computer Graphics and Visualization, January
- 1996 Human Brain Project Annual Meeting, NIH, May
University of Washington, April
- 1995 Human Brain Project Annual Meeting, NIH, May
- 1988 Naval Underwater Systems Center, Newport, RI
Seattle local IEEE meeting
- 1985 Apple Computer

Films and

Videos “Bearly Growing,” with the Caltech Graphics Group, Siggraph Video Review, August, 1995.

“Fruit Tracing,” with the Caltech Graphics Group, Siggraph Electronic Theater, August, 1993.

“[The Hypersphere: Foliations and Projections](#),” with Thomas Banchoff, Hüseyin Koçak, Frederic Bisshopp and David Margolis, Siggraph Animation Screening, 1985; Siggraph Video Review, 1986; Siggraph Art Show, 1986; also shown at numerous mathematics conferences.

“Topology and Mechanics: Flows on the Torus,” with Thomas Banchoff, Hüseyin Koçak and Frederic Bisshopp, Honors Thesis, Brown University, December, 1983.

“Topology and Mechanics: Linear Oscillators and the Hypersphere,” with Thomas Banchoff, Hüseyin Koçak, Frederic Bisshopp and David Margolis, Honors Thesis, Brown University, December, 1983.

Images

“Bee MRI Data,” “Inside a Bee,” “Inside the Human Hand 2,” “Human Hand Montage,” “Lobster MRI Data,” with Matthew J. Avalos, Russell E. Jacobs, Kurt W. Fleischer, and Alan H. Barr, Siggraph Technical Slide Set, 1994; in *Scientific Visualization: The New Eyes of Science*, by Christopher W. Baker, Millbrook Press, Brookfield, CT, 2000.

“Visualization of 2D Velocity, Vorticity, Deformation Rate Tensor, and Turbulent Sources,” with R. Michael Kirby and H. Marmanis; Siggraph Technical Slide Set, 1998; cover of

Visualization '99 Conference Proceedings, 1999; *Computer Graphics and Applications*, Jan/Feb '00.

“Mouse Spinal Cord Diffusion Tensor Visualization Using Concepts from Painting,” with David Kremers, Eric T. Ahrens, Matthew J. Avalos, and Carol Readhead; Siggraph Technical Slide Set, 1998; cover of Visualization '98 Conference Proceedings, 1998; MIT Image and Meaning Conference Exhibition, '01; CIRCA Art Magazine, Autumn 2001, pp 36-37.

“6-Valued MR Image Data Portrayed with Concepts from Painting,” with David Kremers, Eric T. Ahrens, and Matthew J. Avalos, Siggraph Technical Slide Set, 1998.

“Second-order Diffusion Tensor Field Magnetic Resonance Imaging,” with Eric T. Ahrens, Carol Readhead, Celia F. Brosnan, and Scott E. Fraser, Siggraph Technical Slide Set, 1997.

“Goal-directed Linear Combinations of Multi-Valued Magnetic Resonance Data,” with Alan H. Barr and Russell E. Jacobs, Siggraph Technical Slide Set, 1997, *Science*, 278(5342), 1997.

“Volume Rendered Locust,” with Matthew J. Avalos, Siggraph Technical Slide Set, 1996.

“Thorny Man,” with Kurt W. Fleischer, Bena L. Currin, and Alan H. Barr, cover of Siggraph Proceedings, 1995; Siggraph Art Show, 1995; Siggraph Technical Slide Set, 1995.

“Thornballs,” and “Scaled Spheres,” with Kurt W. Fleischer, Bena L. Currin, and Alan H. Barr, Siggraph Technical Slide Set, 1995.

“Human Molar Geometry Derived From MRI,” with Pratik R. Ghosh, Kurt W. Fleischer, Alan H. Barr, and Russell E. Jacobs, Siggraph Technical Slide Set, 1995.

“Human Hand,” “Peeling Banana,” “Volume Rendered Jade Plant,” “Computationally Stained Brain Slice,” and “Computationally Stained Brain Slice 2,” with Matthew J. Avalos, David B. Kirk, John Snyder, Adam R. Woodbury and Alan H. Barr, Siggraph Technical Slide Set, 1992.

“Sphere and Hypersphere,” with Hüseyin Koçak , cover for *Mathematical Intelligencer*, 9(1), 1987; Szymanski, *Introduction to Computers*, Merrill Publishing Co., Columbus, 1988.

“Color Choreography,” with Barbara J. Meier, 2nd place, student category, Raster Technologies Image Contest, 1986; permanent collection, Boston Computer Museum, since 1986; Siggraph Technical Slide Set, 1986; cover for *Brown University Directory of Science and Engineering Research*, 1987; Szymanski, *Introduction to Computers*, Merrill Publishing Co., Columbus, 1988; Szymanski, *Computers and Application Software*, Merrill Publishing Co., Columbus, 1988; Foley, et al, *Computer Graphics, Principles and Practice*, Addison-Wesley, 1992.

“Tubes within Tubes,” with Hüseyin Koçak, Siggraph Art Show, 1986; Szymanski, *Computers and Application Software*, Merrill Publishing Co., Columbus, 1988.

“Inside the Hypersphere,” with Hüseyin Koçak, cover for *Mathematical Intelligencer*, 8(3), 1986; Adage Annual Report, 1987; *The Mathematical Tourist*, Ivars Peterson, W. H. Freeman and Co., New York, 1988, 96.

“Example of Computer Animation,” with Hüseyin Koçak, in *Introduction to Computers and Information Systems*, Thomas H. Athey, Scott Foresman and Co., Glenview IL, 1986.

“The Pedal Surface of a Quartic Curve,” “Focal Surfaces of the Ellipsoid,” with Thomas Banchoff and David Margolis, NY Siggraph Art Expo, 1985; Siggraph Technical Slide Set, 1985; *ID: Magazine of International Design*, 32(1), January-February, 1985, 69.

“Flows on the Torus,” with Thomas Banchoff, Hüseyin Koçak, Frederic Bisshopp and David Margolis, *Scientific American*, September, 1984, 158; *Newsweek*, December 17, 1984, 87; *The Christian Science Monitor*, March 5, 1985, 25; *Veja*, March 6, 1985, 55; NY Siggraph Art Expo, 1985; *Computing Horizons*, Tony Durham, Addison Wesley, New York, 1988, 182; *I Frattali la Geometria Dell’irregolare*, Istituto Della Encyclopedia Italiana, 1988, 35.

“Cyclides of Dupin,” with Thomas Banchoff, Hüseyin Koçak, Frederic Bisshopp and David Margolis, record jacket for “Letters to a Friend,” and “Adman’s Dream,” I Start Counting, Mute Records, London, 1984; book jacket for *The Fourth Dimension: Towards a Geometry of Higher Reality*, Rudy Rucker, Houghton Mifflin, New York, 1984; *ID: Magazine of International Design*, 32(1), January-February, 1985, 71; cover of *Understanding Computers*, Time-Life Books, New York, 1987; *Recent Revolutions in Mathematics*, Albert Stwertka, Franklin Watts, New York, 1987, 92-93; *The Mathematical Tourist*, Ivars Peterson, W. H. Freeman and Co., New York, 1988, 96.

“Swallowtail Catastrophe,” “Figure Eight Klein Bottle,” “Focal Surfaces of the Ellipsoid,” “Veronese Surface,” with Thomas Banchoff, *Perspectives in Mathematics, Anniversary of Oberwolfach 1984*, Birkhäuser, Boston, 1984, 43-60.

“Nautilus,” with David Margolis and Thomas Banchoff, Evans & Southerland Calendar, 1984.

“Sinusoidal Surface,” with Thomas Banchoff and David Margolis, cover for *Calculus with Analytic Geometry*, M. A. Munem and D. J. Foulis, Worth Publishers Inc., New York, 1984.

“World in Perspective,” with Thomas Banchoff, cover for John Hancock Annual Report, 1984.

“Infinite Torus,” with Thomas Banchoff, Hüseyin Koçak and Frederic Bisshopp, cover for *Sunday Journal Magazine*, Providence Journal, October 14, 1984.

“Veronese Surface and a Polyhedral Model,” with Thomas Banchoff and David Salesin, cover for *Mathematical Intelligencer*, 5(3), 1983.

Research Grants and Contracts “ImmGen: a gene expression compendium for immune cells,” \$673K of \$2M, subcontract to NIH R24 Award AI072073-01A1, September 2007 – August 2011

“Bat Wing Structure and the Aerodynamic Mechanisms of Flapping Flight”, Co-PI (Sharon Swartz PI), NSF IOS-0702392, \$280K, September 2007 – August 2010

“Age Effects on HIV associated Brain Dysfunction,” PI on subcontract from Miriam Hospital to Brown, NIH , \$100K of \$1.4M, October 2006 – September 2010.

“A Proposal to Design and Build a Dynamic 3-D Skeletal Imaging System,” Co-PI (Beth Brainerd PI), William M. Keck Foundation, \$1.8M, January 2007 – January 2010.

“IDBR: Hardware and Software Development for 3D Visualization of Rapid Skeletal Motion in Vertebrate Animals,” Co-PI, (Beth Brainerd, PI), NSF Award DBI-05-52051,\$345K. June 2006 – May 2009.

“[3-D Multi-Articular Models of the Carpus](#),” PI on subcontract from Rhode Island Hospital to Brown, NIH, \$450K of \$2M, April 2006 – February 2009.

“High-speed X-ray Imaging Facility for Musculoskeletal Biomechanics Research” Co-PI (Beth Brainerd, PI) Brown Research Seed Funding, \$100K, January 2006 – December 2006.

“[MRI+DTI-Based Tools for Analyzing White Matter Variation](#)”, PI, NIH Award EB4155A1, \$2M. October 2005 – July 2009.

“[DDDAS-TMRP Interactive Data-driven Flow-simulation Parameter Refinement for Understanding the Evolution of Bat Flight](#)”, PI, NSF Award CCR-0540266, \$100K, January 2006 – December 2006.

“[Acquisition of a 3T MRI System](#)”, Co-PI, NSF Award BCS-0521432, \$2M, September 2005 – August 2006.

Metrics for Quantifying White Matter Variation: Image Analysis, Testing, and Application, PI, Brown Research Seed Funding, \$100K, January 2005 – January 2006.

“[TTR: Computational simulation, modeling, and visualization for understanding unsteady bioflows](#),” PI, NSF Award CNS-0427374, \$650K, October 2004 – September 2009.

Aerodynamic mechanisms of bat flight: an integrated multidisciplinary approach, Co-PI (Sharon Swartz, PI), Brown Salomon Award, \$20K, 2004.

“[TTR Collaborative Research: Perceptual Optimization for Data Visualization](#),” PI, NSF Award CCR-0324306, \$104K, September 2003 – August 2006.

“[CAREER: Shape Capture and Modeling for Wrist Dynamics and Ancient Pottery Analysis using Manifold Surfaces and Signed-Distance Volume Images](#),” PI, NSF CAREER Award CCR-0093238, \$324K, March 2001 – February 2007.

“Normal and Abnormal In Vivo Carpal Bone Motion,” PI on subcontract from Rhode Island Hospital to Brown, NIH AR44005, \$650K of \$2.4M, April 2001 – February 2006.

“[TTR: Visualization of Multi-valued Scientific Data: Applying Ideas from Art and Perceptual Psychology](#),” PI, NSF Award CCR-0086065, \$2,296,599 September 2000 – August 2004.

“Visualization for Software Understanding,” NSF Award ACI-9982266, Co-PI, (Steve Reiss, PI), \$559,212, October 1999 – September 2002.

“3D Free-Form Models for Geometric Recovery and Application to Archaeology,” NSF Award BCS-9980091, Co-PI (David Cooper, PI) \$1,370,870, September 1999 – January 2003.

“Multi-valued MRI Acquisition, Visualization, and Dissemination,” PI on subcontract from Caltech to Brown, Human Brain Project, \$400K of \$4M, October 1998 – September 2003.

“Computer Graphics Tools for Understanding Tensor-Valued Volume Data: A Painting Metaphor,” PI, NSF CCR-9619649, \$140K, March 1997 – February 2001.

Professional Service

- 2008 Papers Co-Chair, International Workshop on Volume Graphics (VG) '08
Program Committee, IEEE Visualization '08 Conference
Program Committee, ACM SIGGRAPH Symposium on Interactive 3D Graphics and Games '09 (I3D)
Program Committee, Non-Photorealistic Animation and Rendering (NPAR) '08
Program Committee, 2008 International Conference on Image Processing, Computer Vision, and Pattern Recognition
Program Committee, Computer Graphics and Visualization (CGV) '08
Program Committee, International Conference on Computer Graphics Theory and Applications (GRAPP) '08
Program Committee, International Symposium on Visual Computing (ISCV) '08
NIH study section, July
Reviewing for ACM SIGGRAPH, IEEE Transactions on Visualization and Computer Graphics, IEEE Visualization
- 2007 Co-Chair, Papers, International Workshop on Volume Graphics (VG) '08
Sketches and Posters Committee, SIGGRAPH '07
Program Committee, International Conference on Computer Graphics Theory and Applications (GRAPP) '07
Program Committee, Computer Graphics and Visualization (CGV) '07
Program Committee, Non-Photorealistic Animation and Rendering (NPAR) '07
Reviewing for ACM SIGGRAPH, IEEE Transactions on Visualization and Computer Graphics, IEEE Transactions on Medical Imaging (TMI), Communications of the ACM,

IEEE Visualization, International Workshop on Volume Graphics, International Society for Magnetic Resonance in Medicine Annual Meeting, Elsevier.

2006 Associate Editor, IEEE Trans. on Visualization and Computer Graphics (TVCG)

Best Poster Committee, IEEE Visualization '06 Conference.

Program Committee, International Conference on Computer Graphics Theory and Applications (GRAPP) '07

Program Committee, International Workshop on Volume Graphics (VG) '07

Paper reviewing for ACM SIGGRAPH (papers and courses), IEEE Transactions on Visualization and Computer Graphics, IEEE Transactions on Medical Imaging (TMI) IEEE Computer Graphics and Applications, IEEE Visualization (regular and applications papers), IEEE Symposium on Visual Analytics Science and Technology, International Workshop on Volume Graphics, International Society for Magnetic Resonance in Medicine Annual Meeting, GRAPP, Elsevier.

2005 Associate Editor, IEEE Trans. on Visualization and Computer Graphics (TVCG)

Program Committee, Symposium on Interactive 3D Graphics and Games (I3D) '06

Program Committee, IEEE Visualization '05

Co-Chair, Posters Committee, IEEE Visualization '05

Best Papers Committee, IEEE Visualization '05

Program Committee, Computer Graphics International (CGI) '05

Program Committee, International Conference on Computer Graphics Theory and Applications (GRAPP) '06

Program Committee, International Workshop on Volume Graphics '06

Session Chair, Visualization '05

Paper reviewing for ACM SIGGRAPH (papers and courses), IEEE Computer Graphics and Applications, IEEE Transactions on Visualization and Computer Graphics, IEEE Visualization (regular and applications papers), ACM I3D, CGI, GRAPP, Elsevier, Dagstuhl.

Grant proposal reviewing for the Dutch National Research Council.

Continued invited contributed to the development of a national research agenda for visualization and analysis tools in the service of homeland security; resulting book, *Illuminating the Path*, became RFP for regional homeland-security research centers.

Continued invited participation in a joint NIH- and NSF-sponsored effort to define and author a research agenda entitled *Visualization Research Challenges*. It encompasses visualization and its applications broadly across many disciplines.

- 2004 Associate Editor, IEEE Trans. on Visualization and Computer Graphics (TVCG)
 Program Committee, Symposium on Interactive 3D Graphics and Games (I3D) '05
 Program Committee, Computer Graphics International '05
 Program Committee, IEEE Visualization '04
 Co-Chair, Posters Committee, IEEE Visualization '04
 Associate Chair, Posters Committee, SIGGRAPH '04
 Session Chair, Visualization '04
 Paper reviewing for ACM SIGGRAPH, IEEE Computer Graphics and Applications, IEEE Transaction on Medical Imaging, IEEE Transactions on Visualization and Computer Graphics. IEEE Visualization (regular and applications papers), ACM I3D, Dagstuhl Perspectives Workshop: Visualization and Image Processing of Tensor Fields
 Invited contributor to the development of a national research agenda for visualization and analysis tools in the service of homeland security.
 Invited participant in a joint NIH- and NSF-sponsored effort to define a research agenda for visualization in science and medicine.
- 2003 Associate Editor, IEEE Trans. on Visualization and Computer Graphics (TVCG)
 Program Committee, IEEE Visualization '03
 Co-Chair, Posters Committee, IEEE Visualization '03
 Co-Chair, Posters Committee, SIGGRAPH '04
 Paper reviewing for IEEE Computer Graphics and Applications Special Issue on NPR, ACM SIGGRAPH, ASME JCISE, IEEE CG&A,
 Proposal reviewer for AAAS
 Session Chair, Visualization '03
- 2002 Paper reviewing for SIGGRAPH '02, Graphics Interface '02, IEEE Visualization '02, IEEE Trans. on Medical Imaging, IEEE Computer Graphics and Applications, and CNS Spectrums
 October NIH Human Brain Project special study section (grant review panel)
 Session Chair at Visualization '02
 May NIH Human Brain Project special study section (grant review panel)
- 2001 Paper reviewing for SIGGRAPH '01, Visualization '01, ACM Non-Photorealistic Animation and Rendering (NPAR) '02

External NSF grant reviewing.

Session Chair at Visualization '01.

NSF ITR grant review panel and external NSF grant reviewing.

2000 Program Committee, Joint Eurographics-IEEE TCVG Symposium on Visualization (Vis-Sym) '01.

Paper reviewing for SIGGRAPH '00, Visualization '00, and GI'00.

1999 Paper reviewing for SIGGRAPH '99, Visualization '99, and UIST '99.

Journal paper reviewing for IEEE Trans. on Visualization and Computer Graphics.

Grant reviewing for the Wellcome Trust and the NIH.

Chaired breakout meeting on “Software Component Testing and Comparison Specifications” for biological imaging tools. Human Brain Project annual meeting, NIH.

1998 Conference paper reviewing for SIGGRAPH '98, Visualization '98, and ACM SIGMOD DiSC.

Journal paper reviewing for IEEE Trans. on Visualization and Computer Graphics.

pre-1998 Reviewing for SIGGRAPH Conferences, Visualization Conferences, Volume Visualization Workshops, IEEE Transactions on Visualization and Computer Graphics, IEEE Computer Graphics and Applications, and Computer Aided Geometric Design.

Teaching and Research Advising

Ph.D. Graduates: Daniel Acevedo, 2008; Daniel Keefe, 2007; Liz Marai, 2007; Song Zhang, 2006; Eileen Vote, 2001 (co-advised with Martha Joukowsky)

Ph.D. Candidates: Wenjin Zhou, 2008; Jadrian Miles, 2008; Cagatay Demiralp, 2007; Radu Jianu, 2007; Daniel Acevedo, 2002; Daniel Keefe, 2000; Liz Marai, 2000; Song Zhang, 1999

Sc.M. Graduates: Andy Wald, 2008; Misha Kostandov, 2008; Ryan Boller, 2008; Devon Penney, 2007; Igor Pivkin, 2006; Vadim Slavin, 2005; David Eigen, 2004; Cagatay Demiralp, 2004; Eduardo Hueso, 2004; Jason Sobel, 2003; Andreas Wenger, 2002; Prabhat, 2001

Undergraduate Honors Theses: Stephanie Lee, 2005; Andrew McClain, 2003; Andrew Hull, 2003 (Visual Art); Rachel Weinstein, 2002; Jason Sobel, 2002; Marco da Silva, 2001; Danah Boyd, 2000

2008

[Virtual Reality Design for Science \(CS 137\)](#)

[Software System Design \(CS 190\)](#)

Postdoctoral Research Advising: Jian Chen, Daniel Keefe

Graduate Research Advising: Ryan Boller, Cagatay Demiralp, Radu Jianu, Jadrian Miles, Trevor O'Brien, Laura Sevilla, Andrew Wald, Wenjin Zhou

Reader: Evan Levanthal (biomedical engineering MD/PhD), Payman Yadollahpour (quals)

Undergraduate Research Advising: David Ginsburg

2007

[Software System Design \(CS 190\)](#)

[Interdisciplinary Scientific Visualization \(CSCI 2370\)](#)

Postdoctoral Research Advising: Jian Chen, Daniel Keefe

Graduate Research Advising: Daniel Acevedo Feliz, Ryan Boller, Cagatay Demiralp, Radu Jianu, Daniel Keefe, Misha Kostandov, Liz Marai, Jadrian Miles, Devon Penney, Andrew Wald, Song Zhang, Wenjin Zhou

2006

[Software System Design \(CS 190\)](#)

[Virtual Reality Design for Science \(CS 137\)](#)

Postdoctoral Research Advising: Jian Chen, David Tate (Psychology)

Graduate Research Advising: Daniel Acevedo Feliz, Ryan Boller, Jon Clayden (visiting PhD student from U. Edinburgh), Cagatay Demiralp, Radu Jianu, Daniel Keefe, Misha Kostandov, Liz Marai, Jadrian Miles, Devon Penney, Igor Pivkin (Appl. Math), Andrew Wald, Song Zhang, Wenjin Zhou

Reader: Aparna Das, Joe Kniss (U. Utah), Sonia Leach, Aggeliki Tsoli

2005

[Software System Design \(CS 190\)](#)

[Interdisciplinary Scientific Visualization \(CS 237\)](#)

Graduate Research Advising: Daniel Acevedo Feliz, Cagatay Demiralp, David Eigen, Radu Jianu, Daniel Keefe, Misha Kostandov, Wenjin Zhou, Dmitri Lemmerman, Liz Marai, Igor Pivkin (Appl. Math), Vadim Slavin, Song Zhang

Undergraduate Research Advising: Stephanie Lee, Misha Zaitzeff

Examiner: Dana Tenneson, Joe Kniss (U. Utah)

Reader: Joe LaViola, Sonia Leach.

- 2004 [Virtual Reality Design for Science \(CS 137\)](#)
- Postdoctoral Research Advising: Cullen Jackson, Eileen Vote
- Graduate Research Advising: Daniel Acevedo Feliz, Cagatay Demiralp, David Eigen, Eduardo Hueso, David Karelitz, Daniel Keefe, Dmitri Lemmerman, Liz Marai, Igor Pivkin (Appl. Math), Stephen Seow (Psych.), Vadim Slavin, Song Zhang
- Undergraduate Research Advising: Stephanie Lee, Misha Zaitzeff
- Examiner: Peter Sibley, Steve Seow (Psych.), Joe Kniss (U. Utah)
- Reader: Joe LaViola, Gordon Kindlmann (U. Utah)
- 2003 [Interdisciplinary Scientific Visualization \(CS 237\)](#)
- [Software System Design \(CS 190\)](#)
- Postdoctoral Research Advising: Cullen Jackson, Eileen Vote
- Graduate Research Advising: Daniel Acevedo Feliz, Cagatay Demiralp, Eduardo Hueso, David Karelitz, Daniel Keefe, Liz Marai, Igor Pivkin (Appl. Math), Stephen Seow (Psych.), Vadim Slavin, Jason Sobel, Song Zhang
- Undergraduate Research Advising: Andrew McClain, Misha Zaitzeff
- 2002 [Interdisciplinary Scientific Visualization \(CS 237\)](#) Newly developed class co-taught with RISD professor Fritz Drury. RISD and Brown students work together to explore design and realization issues for virtual reality scientific visualization applications in Brown's Cave.
- Postdoctoral Advising: Cullen Jackson, Eileen Vote
- Graduate Advising: Daniel Acevedo Feliz, Kevin Audleman, Cagatay Demiralp, Eduardo Hueso, David Karelitz, Daniel Keefe, Liz Marai, Jason Sobel, Andy Wenger, Song Zhang
- Undergraduate Advising: Andrew McClain, Akash Parikh, Phil Stone, Rachel Weinstein
- 2001 [Software System Design \(CS 190\)](#)
- Postdoctoral Advising: Cullen Jackson, Eileen Vote
- Graduate Advising: Daniel Acevedo Feliz, Stuart Andrews, Kevin Audleman, Daniel Keefe, Mike Kirby, Liz Marai, Prabhat, Eileen Vote, Andy Wenger, Song Zhang
- Undergraduate Advising: Marco da Silva, Scott Davidson, Sarah Papp, Andrew Pienaar, Merrie Ringel, Phil Stone, Rachel Weinstein
- Examiner: Gordon Kindlmann (U. Utah)
- Reader: R. Michael Kirby, Sc.M.
- 2000 [Interdisciplinary Scientific Visualization \(CS237\)](#)

Software System Design (CS190)

Graduate Advising: Daniel Acevedo Feliz, Stuart Andrews, Daniel Keefe, Mike Kirby, Joe La Viola, Joe Lee, Liz Marai, Prabhat, Eileen Vote, Song Zhang

Undergraduate Advising: Marco da Silva, Scott Davidson, Samuel Ginsberg, Daniel Morris, Andrew Pienaar, Merrie Ringel, Phil Stone, Benjamin White.

Reader: Lisa Zorn, Sc.B.; Margaret Kosmala, Sc.B.

- 1999 [Interdisciplinary Scientific Visualization \(CS295-5\)](#). I developed and taught this course for the first time this year. In it, students emulated the process of doing interdisciplinary research by applying for grants, having their proposals evaluated, implementing them, and presenting their work at a mock conference. The groups for each project were required to have participants from multiple disciplines, exposing them to many of the skills required for multi-disciplinary collaborative work. The class also experimented with using a Rhetoric and Writing Fellow to help students with communication skills.

Software System Design (CS190)

Graduate Advising: Daniel Acevedo Feliz, Stuart Andrews, Mike Kirby, Jaehoon Lee, Liz Marai, Paul Reitsma, Song Zhang, Gordon Kindlmann (U. Utah)

Undergraduate Advising: David Akers, Charlie Curry, Cagatay Demiralp, Marco da Silva, Rob Manchester, Toan Pham, Jonathan Reiter.

Reader: Joe LaViola, Sc.M.; Lee Markosian, Ph.D.

- 1998 [Computer Graphics Seminar \(CS 295-1\)](#) (with Nancy Pollard).

Undergraduate Advising: Danijela Cabrac, Nemanja Petrovic, Jit Kee Chin, Laura Brogach, Kristin Cole, Yury Goldfeld.

- 1997 Undergraduate Advising: Seth Blumberg, Clifford Elgin, David Devault, Jed Wing.

University Service

- 2008 Chair (Winter), CS Faculty Search Committee
Member (Fall), CS Faculty Search Committee
CS Computing/Facilities Committee
Brown RISD Dual Degree (BRDD) Steering Committee
Freshmen and Sophomore Advising
BRDD Student Advising
Center for Computation and Visualization (CCV) Advisory Committee
Magnetic Resonance Facility (MRF) Executive Committee

- MRF Science Advisory Board
- BSP search committee (MR Physicist)
- 2007 Chair, CS Faculty Search Committee
- Chair, CS Computing/Facilities Committee
- Freshmen and Sophomore Advising
- Center for Computation and Visualization (CCV) Advisory Committee
- Magnetic Resonance Facility (MRF) Executive Committee
- MRF Science Advisory Board
- BSP search committee
- Hosted seminar/colloquium speakers: Gordon Kindlmann, Van Wedeen
- 2006 University Resources Committee (URC)
- Search Committee for university Chief Information Officer and Vice President of CIS
- Chair, CS Computing/Facilities Committee
- Managed Compilation of All Departmental Research Results for NRC Review
- Search Committee for CS Department Manager
- Search Committee for CS Faculty
- CS ad hoc Brochure Visual-Design Committee
- Freshmen Advising
- Center for Computation and Visualization (CCV) Advisory Committee
- Magnetic Resonance Facility (MRF) Executive Committee
- MRF Science Advisory Board
- Brain Science Program (BSP) Executive Committee
- Wriston Fellowship Selection Committee
- Writing Fellows Advisory Board
- Hosted seminar/colloquium speakers: David C. Banks, TJ Janken-Kelly, Robert S. Laramée, Frederic Leymarie, Andy Lomas.
- 2005 University Resources Committee (URC)
- Magnetic Resonance Facility (MRF) Executive Committee

- MRF Science Advisory Board
- Center for Computation and Visualization (CCV) Advisory Committee
- CCV Director Search Committee
- Brain Science Program (BSP) Executive Committee
- Committee for Inter-Institutional Cooperation (CIC) (Brown/RISD)
- Wriston Fellowship Selection Committee
- Chair, CS Computing/Facilities Committee
- CS ad hoc web upgrade committee
- Hosted seminar/colloquium speakers: Donald House, Arie Kaufmann, Gideon May, Dmitri Metaxis, Colin Ware
- Moderated Royce Fellows' Seminar
- 2004 University Resources Committee (URC)
- Magnetic Resonance Facility (MRF) Executive Committee
- MRF Search Committee
- Center for Computation and Visualization (CCV) Advisory Committee
- Committee for Inter-Institutional Cooperation (CIC) (Brown/RISD)
- Medical School Applicant Interviewing
- CS Curriculum Committee
- CS Facilities Committee
- CS ad hoc administrative staff search committee
- Hosted seminar/colloquium speakers: Derek Jones, John Allman, Hanspeter Pfister, Kelly Gaither, Tom Raidler, and Robert Moorhead
- 2003 Magnetic Resonance Facility (MRF) Executive Committee
- MRF Search Committee
- Brown/RISD ad hoc committee on collaboration and newly created standing Committee for Inter-Institutional Cooperation (CIC)
- Ad hoc Computational Initiative Committee
- CS Graduate Admissions Committee
- CS ad hoc Teaching Load Committee

Hosted seminar/colloquium speakers: Iain Woodhouse, Dean Turner, Felice Frankel, Beth Meyerand, Xianfeng Gu, Robert Moorhead, Daniel Weiskopf, Philip Fu, Robert Haimes, Raghu Machiraju, Colin Ware

2002 Magnetic Resonance Facility Executive Committee

Brown/RISD committee on collaboration

CS Graduate Admissions Committee

Hosted seminar/colloquium speakers: Tarn Tanner, Greg Little

2001 CS Graduate Admissions Committee

Magnetic Resonance Facility Executive Committee

Brain Science Program Web Site Committee

Brain Science Program Graduate Advisory and Admissions Committee

Brain Science Program Brochure Committee

Hosted seminar/colloquium speaker: davidkremers (Caltech)

Undergraduate and graduate academic advising

2000 Chaired CS Graduate Recruiting Committee

CS Graduate Admissions Committee

Magnetic Resonance Facility Executive Committee

Brain Science Program Web Site Committee

Brain Science Program Graduate Advisory and Admissions Committee

Brain Science Program Brochure Committee

Hosted seminar/colloquium speakers: Peter Basser (NIH), Chris Johnson (U. Utah), Maurizio Forte (Florence).

Committee to develop speaker series on “What Physics can Measure: What Biologists Want to Measure”

Committee to develop speaker series on Simulation and Visualization.

Undergraduate and graduate academic advising

1999 Chaired CS Graduate Recruiting Committee

CS Graduate Admissions Committee

Brain Science Program Web Site Committee

Brain Science Program Graduate Advisory Committee

Hosted seminar/colloquium speakers: Felice Frankel (MIT and Victoria Interrante (U. Minn.)

Hosted a department Town Meeting

1998 CS Graduate Recruiting Committee

Undergraduate and graduate academic advising

Helped make available color printing and slide-making to the department.

Memberships Sigma Xi, IEEE Senior Member, ACM, SIGGRAPH, ISMRM.

Prepared January 9, 2009