Ross T. Whitaker
937 E. 2nd Avenue, Salt Lake City, UT 84103
(W) 801/587-9549, (H) 801/524-0866
email: whitaker@cs.utah.edu — url: www.cs.utah.edu/∼whitaker

EDUCATION

1/89 to 10/93 **The University of North Carolina** Chapel Hill, NC
Department of Computer Science: Ph.D. 1993, M.S. 1991.
- Course work emphasized computer vision, graphics, visualization, and parallel systems.
- Dissertation in nonuniform diffusion for image segmentation (advisor: S.M. Pizer).
- University of North Carolina Alumni Fellowship 1992-93.

9/82 to 6/86 **Princeton University** Princeton, NJ
Electrical Engineering and Computer Science/Engineering Physics, B.S. June 1986.
- G.P.A. 3.8/4.0.
- Summa cum laude, Phi Beta Kappa, Tau Beta Pi.

WORK EXPERIENCE

8/00–present **University of Utah** Salt Lake City, UT
8/07: Professor, School of Computing; Adjunct Professor, Bioengineering
8/03: Associate Professor, School of Computing; Adjunct Associate Professor, Bioengineering
8/00: Assistant Professor, School of Computing

3/96 to 7/00 **University of Tennessee** Knoxville, TN
Assistant Professor—Department of Electrical Engineering.

1/94 to 3/96 **European Computer-Industry Research Centre (ECRC)** Munich, Germany
Research Scientist—User Interaction and Visualization Group
- Developed new modeling methods for 3d segmentation and reconstruction.
- Built an object-oriented image processing platform.
- Researched and developed technologies for augmented reality.
- Led a small group of researchers and developed funded European research collaborations in excess of 2M DM.

9/89 to 10/93 **The University of North Carolina** Chapel Hill, NC
Research Assistant—Medical Image Analysis and Display Group
- Developed geometry-limited diffusion as a method for segmenting images on the basis of homogeneity in multiscale geometric structure.
- Developed algorithms and interactive tools for hierarchical image segmentation on the basis of image geometry.

9/86 to 8/88 **The Boston Consulting Group** Boston, MA
Management Consultant
- Structured analyses of business problems in a variety of industries.
- Conducted analyses, formulated conclusions, and presented findings to clients.

summer 1985 **M.I.T. Lincoln Laboratory** Lexington, MA
Intern—IC Laser Restructuring Research Group
- Investigated feasibility of real-time image-processing system based on a wafer-scale parallel processor.
- Created preliminary design for a microprocessor-controlled video processing system.

HONORS AND AWARDS

- *Best Paper of Journal Award*, Medical Image Analysis 2010 (MICCAI 2009), "Manifold modeling for brain population analysis".
- *Best Paper Award*, Int. Meshing Roundtable 2010, "Particle systems for adaptive, isotropic meshing of CAD models".
- NSF CAREER Award (Signal Processing Systems Program, 2000)
- University of Tennessee 1997, College of Engineering/Allied Signal Award for Outstanding Research and Teaching.
- University of North Carolina, Alumni Fellowship, 1993.
- Princeton University 1986: Summa Cum Laude, Phi Beta Kappa, Tau Beta Pi.

PUBLICATIONS

Refereed Journals

1. P. Tóth, J. Lighty, A. Palos, R. Whitaker, E. Eddings, "A novel framework for the quantitative analysis of high resolution transmission electron micrographs of soot II. Robust multiscale nanostructure quantification Combustion and Flame", *J. of Combustion and Flame*, to appear.
2. K.B. Jones, M. Datar, S. Ravichandran, H. Jin, E. Jurrus, R.T. Whitaker, M.R. Capecchi, "Toward an understanding of the short bone phenotype associated with multiple osteochondromas", *J. of Orthopedic Research*, to appear.
3. S. Gerber, R. Whitaker, "Regularization Free Princpal Curve Estimation", *J. of Machine Learning Research*, to appear.
4. S. Gerber, O. Ruebel, P.-T. Bremer, V. Pascucci, R. Whitaker, Morse-Smale Regression, *J. of Computational and Graphical Statistics*, Spring, 2012.
5. T. Ziemek, S. Creem-Regehr, W.Thompson, R. Whitaker, "Evaluating the effectiveness of orientation indicators with an awareness of individual differences", *ACM Trans. Appl. Perception*, 9(2), pp. 7:1–7:23, 2012.
6. Z. Fu, W.-K. Jeong, Y. Pan, R.M. Kirby, R.T. Whitaker, "A Fast Iterative Method for Solving the Eikonal Equation on Triangulated Surfaces" *SIAM J. Scientific Computing*, 33(5), pp. 2468–2488, 2011.
7. Y. Pan, W.-K. Jeong, R.T. Whitaker, "Markov surfaces: A probabilistic framework for user-assisted three-dimensional image segmentation", *Computer Vision and Image Understanding*, 115(10), pp. 1375–1383, 2011.
8. E. Jurrus, A.R. Paiva, S. Watanabe, J.R. Anderson, B.W. Jones, R.T. Whitaker, E.M. Jorgensen, R.E. Marc T. Tasdizen, "Detection of neuron membranes in electron microscopy images using a serial neural network architecture", *Medical Image Analysis*, 14(6), pp. 770–783, 2010.
9. S. Gerber, P.T. Bremer, V. Pascucci, R. Whitaker, "Visual exploration of high dimensional scalar functions", *IEEE Trans. on Visualization and Computer Graphics* 16(6), pp. 1271–1280, 2010.
10. T. Tasdizen, P. Koshevoy, B.C. Grimm, J.R. Anderson, B.W. Jones, C.B. Watt, R.T. Whitaker, R.E. Marc, "Automatic mosaicking and volume assembly for high-throughput serial-section transmission electron microscopy", *J. Neuroscience Methods*, 193(1), pp. 132–144, 2010.
11. S. Gerber, T. Tasdizen, P.T. Fletcher, S. Joshi, R. Whitaker, "Manifold modeling for brain population analysis", *Medical Image Anal* , 14(5), pp. 643–653, 2010.
12. P.T. Fletcher, R. Whitaker, R. Tao, M.B. DuBray, A. Froehlich, C. Ravichandran, A.L. Alexander, E.D.

Bigler, N. Lange, J.E. Lainhart, "Microstructural connectivity of the arcuate fasciculus in adolescents with high-functioning autism", *Neuroimage*, 51(3), pp. 1117–1125, 2010.

13. J.R. Anderson, S. Mohammed, B. Grimm, B.W. Jones, P. Koshevoy, T. Tasdizen, R. Whitaker, R.E. Marc, "The Viking viewer for connectomics: scalable multi-user annotation and summarization of large volume data sets", *J. Microscopy*, 241(1), pp. 13–28, 2010.
14. R.S. Macleod, J.G. Stinstra, S. Lew, R.T. Whitaker, D.J. Swenson, M.J. Cole MJ, J. Krüger J, D.H. Brooks, C.R. Johnson, "Subject-specific, multiscale simulation of electrophysiology: a software pipeline for image-based models and application examples", *Phil. Trans. A Math Phys Eng Sci*, 367(1896), pp. 2293–2310, 2009
15. W.-K. Jeong, J Beyer, M. Hadwiger, A Vazquez, H. Pfister, R. Whitaker, "Scalable and Interactive Segmentation and Visualization of Neural Processes in EM Datasets", *IEEE Trans. Visualization and Computer Graphics*, (15)6, pp. 1505–1514, 2009.
16. J.R. Anderson, B.W. Jones, J.-H. Yang, M.V. Shaw, C.B. Watt, P. Koshevoy, J. Spaltenstein, E. Jurrus, Kannan UV, R. Whitaker, D. Mastronarde, T. Tasdizen, R. Marc, "A Computational Framework for Ultrastructural Mapping of Neural Circuitry", *PLoS Biology* 7(3), 2009.
17. E. Jurrus, T. Tasdizen, P. Koshevoy, P. T. Fletcher, M. Hardy, C. Chien, W. Denk, R. Whitaker, "Axon Tracking in Serial Block-Face Scanning Electron Microscopy", *Medical Image Analysis*, 13(1), pp. 180–188, 2009.
18. M. Meyer, R. Whitaker, R.M. Kirby, C. Ledergerber, H. Pfister, "Particle-based Sampling and Meshing of Surfaces in Multimaterial Volumes", *IEEE Trans. Visualization and Computer Graphics*, 14(6), pp. 1539-1546, 2008.
19. O. Nemitz, M.B. Nielsen, M. Rumpf, R. Whitaker, "Finite Element Methods on Very Large, Dynamic Tubular Grid Encoded Implicit Surfaces", *SIAM J. of Scientific Computing*, 31, pp. 2258, 2008.
20. W.-K. Jeong, R. Whitaker, "A fast iterative method for Eikonal equations", *SIAM J. of Scientific Computing*, 30(5), pp.2512-2534, 2008.
21. G. Kindlmann, D. B. Ennis, R. Whitaker, C.-F. Westin, "Diffusion tensor analysis with invariant gradients and rotation tangents", *IEEE Trans. Med. Imaging*, 26(11), pp. 1483–1499, 2007.
22. H. B. Henninger, S. A. Maas, C. J. Underwood, R. T. Whitaker, J. A. Weiss, "Spatial distribution and orientation of dermatan sulfate in human medial collateral ligament", *J. of Structural Biology*, 158(1), pp. 33-45, 2007.
23. M. Meyer, B. Nelson, R. Kirby, R. Whitaker, "Particle systems for efficient and accurate high-order finite element visualization", *IEEE Trans. Visualization and Compututer Graphics*, 13(5), pp. 1015–1026, 2007.
24. O. Nemitz, M. Rumpf, T. Tasdizen, R. Whitaker, "Anisotropic curvature motion for structure enhancing smoothing of 3D MR angiography data", *Journal of Mathematical Imaging and Vision*, 27(3):217-229, 2007.
25. S. Awate, R. Whitaker, "Feature-preserving MRI denoising using a nonparametric, empirical-Bayes approach", *IEEE Trans. Medical Imaging*, 26(9), pp. 1242–1255, 2007.
26. G. Adluru, S. Awate, T. Tasdizen, R. Whitaker, E. Dibella, "Temporally constrained reconstruction of dynamic cardiac perfusion MRI", *Magnetic Resonance in Medicine'*, 57, pp. 1027–1036, 2007.
27. S. Awate, T. Tasdizen, R. Whitaker, N. Foster , "Adaptive, nonparametric Markov modeling for unsupervised, MRI brain-tissue classification", *Medical Image Analysis*, 10(5), pp. 726-739, 2006.
28. S. Awate, R. Whitaker, "Unsupervised, information-theoretic, adaptive image filtering for image restora-

tion", *IEEE Trans. on Pattern Analysis and Machine Intelligence*, 28(3), pp. 364–376, 2005.

29. K. Museth, D.E. Breen, R.T. Whitaker, S. Mauch, D. Johnson, "Algorithms for interactive editing of level set models", *Computer Graphics Forum*, 24(4), pp. 821–841, 2005.
30. J. Cates, R. Whitaker, G. Jones, "Case study: an evaluation of user-assisted hierarchical watershed segmentation", *Medical Image Analysis*, 9(6), pp. 566–578, 2005.
31. R. Whitaker, "Modeling deformable surfaces with level sets", *IEEE Computer Graphics and Applications*, 24(5), pp. 6–9, 2004.
32. J. Cates, A.E. Lefohn, R. Whitaker, "GIST: an interactive GPU-based level-set segmentation tool for 3D medical images", *Medical Image Analysis*, 8(3), pp. 217–231, 2004.
33. A. E. Lefohn, J. M. Kniss, C. D. Hansen, R. T. Whitaker, "A atreaming narrow-band algorithm: interactive deformation and visualization of level sets", *IEEE Trans. Visualization and Computer Graphics*, 10(40), pp. 422–433, 2004.
34. T. Tasdizen, R. Whitaker, "Higher-order nonlinear priors for surface reconstruction", *IEEE Trans. on Pattern Recognition and Machine Intelligence*, 26(7), pp. 878–891, 2004.
35. T. Tasdizen, R. Whitaker, P. Burchard, S. Osher, "Geometric surface processing via normal maps", *ACM Trans. on Graphics*, 22(4), pp. 1012–1033, 2003.
36. L. Zhukov, K. Museth, D. Breen, R. Whitaker, A. Barr, "Level set modeling and segmentation of DT-MRI brain data", *Journal of Electronic Imaging*, 12(1), pp. 125-133, 2003.
37. R. Whitaker, V. Elangovan, "A direct approach to estimating surfaces in tomographic data", *Journal of Medical Image Analysis*, 6(3), pp. 235–249, 2002.
38. R. Whitaker, J. Gregor, "A maximum likelihood surface estimator for dense range data", *IEEE Trans. on Pattern Analysis and Machine Intelligence*, 24(10), pp. 1372–1387, 2002.
39. R. Whitaker, E. L. Valdes-Juarez, "On the reconstruction of height functions and terrain maps from dense range data", *IEEE Trans. on Image Processing*, 11(7), pp. 704–716, 2002.
40. J. Gregor, R. Whitaker, "Indoor scene reconstruction for sets of noisy range images", *Graphical Models* 63(5), pp. 304–332, 2002.
41. D. Breen, R. Whitaker, "A level-set approach to 3D shape metamorphosis", *IEEE Trans. on Visualization and Computer Graphics*, 7(2), pp. 173–192, 2001.
42. R. Whitaker, "A level-set approach to image blending", *IEEE Trans. on Image Processing*, 9(11), pp. 1849–1861, 2000.
43. A. Mangan, R. Whitaker, "Partitioning 3D surface meshes using watershed segmentation", *IEEE Trans. on Visualization and Computer Graphics*, 5(4), pp. 308–321, 1999.
44. D. L. Elsner, R. Whitaker, and M. A. Abidi, "Volumetric modeling of objects and scenes using range images", *Digital Signal Processing: A Review Journal*, 9(2), pp. 120–135, 1999.
45. S. G. Burgiss, R. Whitaker, and M. A. Abidi, "Range image segmentation through pattern analysis of the multi-scale wavelet transform", *Digital Signal Processing: A Review Journal*, 8(4), pp. 267–276, 1998.
46. R. Whitaker, "A level-set approach to 3D reconstruction from range data", *Int. Journal of Computer Vision*, pp. 203–231, 1998.
47. G.J. Klinker, K.H. Ahlers, D.E. Breen, P.-Y. Chevalier, C. Crampton, D.S. Greer, D. Koller, A. Kramer, E. Rose, M. Tuceryan, R. Whitaker, "Confluence of computer vision and interactive graphics for augmented reality", *PRESENCE*, 6(4), 1997.

48. M. Tuceryan, D. Greer, R. Whitaker, D. Breen, C. Crampton, E. Rose, K. Ahlers, "Calibration requirements and procedures for a monitor-based augmented reality system", *IEEE Trans. on Visualization and Computer Graphics*, 1(3), pp. 255–273, 1995.
49. W. Snyder, Y.-S. Han, G. Bilbro, R. Whitaker, S.M. Pizer, "Image relaxation: restoration and feature extraction", *IEEE Trans. on Pattern Analysis and Machine Intelligence*, 17(6), pp. 620–624, 1995.
50. R. Whitaker, "Geometry-limited diffusion in the characterization of geometric patches in images", *CVGIP: Image Understanding*, 57(1), pp. 99–110, 1993.
51. R. Whitaker, S.M. Pizer, "A multiscale approach to nonuniform diffusion", *CVGIP: Image Understanding*, 57(1), pp. 111–120, 1993.
52. T.S. Yoo, U. Nuemann, H. Fuchs, S.M. Pizer, T. Cullip, J. Rhoades, R. Whitaker, "Direct visualization of volume data", *IEEE Computer Graphics and Applications*, 12(4), pp. 63–71, 1992.

Conference Proceedings—Full Paper Review

1. S.P. Awate, P. Zhu, R.T. Whitaker, "How Many Templates Does It Take for a Good Segmentation?: Error Analysis in Multiatlas Segmentation as a Function of Database Size", *Proc. Int. Workshop Multimodal Brain Image Analysis (MBIA, at MICCAI), Lecture Notes in Computer Science (LNCS)*, Vol. 2, pp. 103–114, 2012.
2. M. Datar, P. Muralidharan, A. Kumar, S. Gouttard, J. Piven, G. Gerig, R. Whitaker, P. T. Fletcher, "Mixed-Effects Shape Models for Estimating Longitudinal Changes in Anatomy", *Proc. 2nd Int. MICCAI Workshop on Spatiotemporal Image Analysis for Longitudinal and Time-Series Image Data (STIA'12)*, 2012.
3. Bronson, J., Levine, J. Whitaker R., "Lattice Cleaving: Conforming Tetrahedral Meshes of Multimaterial Domains with Bounded Quality". *Proc. of the 21st Int. Meshing Roundtable*, pp. 191–209, 2012.
4. B. Paniagua, L. Bompard, J. Cates, R. Whitaker, M. Datar, C. Vachet, M. Styner, "Combined SPHARM-PDM and entropy-based particle systems shape analysis framework", *Soc. of Photo-Optical Instrumentation Engineers (SPIE) Conf. Series,* 8317, pp. 20, 2012.
5. P. Zhu, S.P. Awate, S. Gerber, R.T. Whitaker, "Fast Shape-Based Nearest-Neighbor Search for Brain MRIs Using Hierarchical Feature Matching", *Int. Conf. on Medical Image Computing and Computer Assisted Intervention (MICCAI '11)*, pp. 484–491, 2011.
6. M. Datar, Y. Gur, B. Paniagua, M. Styner, R.T. Whitaker, "Geometric Correspondence for Ensembles of Nonregular Shapes", *Int. Conf. on Medical Image Computing and Computer Assisted Intervention (MICCAI '11)*, pp. 368–375, 2011.
7. X. Hao, R.T. Whitaker, P.T. Fletcher, "Adaptive Riemannian Metrics for Improved Geodesic Tracking of White Matter", *Information Processing in Medical Imaging*, pp. 13–24, 2011.
8. J. R. Bronson, J. A. Levine, and R. T. Whitaker, "Particle systems for adaptive, isotropic meshing of CAD models". *Proc. of the 19th Int. Meshing Roundtable*, pp. 279–296, 2010.
9. M. Datar, J. Cates, T. Fletcher, S. Gouttard, G. Gerig, R. Whitaker, "Particle Based Shape Regression of Open Surfaces with Applications to Developmental Neuroimaging", *Int. Conf. on Medical Image Computing and Computer Assisted Intervention (MICCAI '09)*, pp. 167–174, 2009.
10. S. Gerber, S. Joshi, T. Tasdizen, R. Whitaker, "On the Manifold Structure of the Space of Brain Images", *Int. Conf. on Medical Image Computing and Computer Assisted Intervention (MICCAI '09)*, pp. 305–312, 2009.

11. S. Gerber, T. Tasdizen, R. Whitaker, "Dimensionality Reduction and Principal Surfaces via Kernel Map Manifolds", *Proc. Int. Conf. on Computer Vision (ICCV)*, 2009.
12. R. Tao, P.T. Fletcher, R. Whitaker, "An Variational Image-Based Approach to the Correction of Susceptibility Artifacts in the Alignment of Diffusion Weighted and Structural MRI", *Proc. Information Processing in Medical Imaging*, pp. 664–672, 2009.
13. J. Cates, P. T. Fletcher, M. Styner, H. Hazlett, R. Whitaker, "Particle-based shape analysis of multi-object complexes", *Proc. Int. Conf. on Medical Image Computing and Computer Assisted Intervention (MICCAI '08)*, pp. 477–485, 2008.
14. J. Cates, P. T. Fletcher, Z. Warnock, R. Whitaker, "A shape analysis framework for small animal phenotyping with application to mice with a targeted disruption of Hoxd11", *Proc. IEEE Int. Sym. on Biomedical Imaging (ISBI '08)*, pp. 512–516, 2008.
15. I. Oguz, J. Cates, P. T. Fletcher, R. Whitaker, D. Cool, S. Aylward, M. Styner, "Entropy-based particle systems and local features for cortical correspondence optimization", *Proc. IEEE Int. Sym. on Biomedical Imaging (ISBI '08)*, pp. 1637–1641, 2008.
16. E. Jurrus, R. Whitaker, B. Jones, R. Marc, T. Tasdizen, "An optimal-path approach for neural circuit reconstruction", *Proc. IEEE Int. Sym. on Biomedical Imaging (ISBI '08)*, pp. 1609–1612, 2008.
17. O. Nemitz, M. B. Nielsen, M. Rumpf, R. Whitaker, "Narrow band methods for pdes on very large implicit surfaces", *Proc. Vision, Modeling and Visualization*, pp. 171–180, 2007.
18. W.-K. Jeong, P. Fletcher, R. Tao, R. Whitaker, "Interactive visualization of volumetric white matter connectivity in DT-MRI using a parallel-hardware Hamilton-Jacobi solver", *Proc. IEEE Visualization*, pp. 1480–1487, 2007
19. M. Meyer, R. Kirby, R. Whitaker, "Topology, accuracy, and quality of isosurface meshes using dynamic particles", *Proc. IEEE Visualization*, pp. 1704–1711, 2007.
20. S. Gerber, T. Tasdizen, R. Whitaker, "Robust non-linear dimensionality reduction using successive 1-dimensional Laplacian eigenmaps", *Proc. Intl. Conf. on Machine Learning*, pp. 281–288, 2007.
21. J. Cates, P. T. Fletcher, M. Styner, M. Shenton, R. Whitaker, "Shape modeling and analysis with entropy-based particle systems", *Proc. Information Processing in Medical Imaging*, pp. 333–345, 2007.
22. P. T. Fletcher, R. Tao, W.-K. Jeong, R. T. Whitaker, "A volumetric approach to quantifying region-to-region white matter connectivity in diffusion tensor MRI", *Proc. Information Processing in Medical Imaging*, pp. 346–358, 2007.
23. S. Basu , P.T. Fletcher, R. Whitaker, "Rician noise removal in diffusion tensor MRI", *Medical Image Computing and Computer-Assisted Intervention*, pp. 117–125, 2006.
24. W.K. Jeong, R. Whitaker, M. Dobin, "Interactive 3D Seismic Fault Detection on the Graphics Hardware", *Proceedings Int. Work. on Volume Graphics*, pp.111–118, 2006.
25. G. Adluru, E. Di Bella, R. Whitaker, "Automatic segmentation of cardiac short axis slices in perfusion", *Proc. IEEE Intl. Sym. on Biomedical Imaging*, pp. 133–136, 2006.
26. S. Awate, T. Tasdizen, R. Whitaker, "Unsupervised texture segmentation with nonparametric neighborhood statistics", *European Conf. on Computer Vision*, pp. 494–507, 2005.
27. T. Tasdizen, S. Awate, R. Whitaker, N. Foster, "MRI tissue classification with neighborhood statistics: a nonparametric, entropy-minimizing approach", *Medical Imaging Computing and Computer-Assisted Intervention* , pp. 517–525, 2005.
28. S. Awate, R. Whitaker, "Nonparametric neighborhood statistics for MRI denoising", *Information Processing in Medical Imaging*, pp. 677–688, 2005.

29. T. Tasdizen, R. Whitaker, R. Marc, B. Jones, "Enhancement of cell boundaries in transmission micropscopy images", *IEEE Int. Conf. on Image Processing*, pp. 129–132, 2005.

30. S. Awate, R. Whitaker, "Image denoising with unsupervised information-theoretic adaptive filtering", *Int. Conf. on Computer Vision and Pattern Recognition*, pp. 44–51, 2005.

31. M.Meyer, P. Georgel, R. Whitaker, "Robust particle systems for curvature dependent sampling of implicit surfaces", *Int. Conf. on Shape Modeling and Applications*, pp. 124–133, 2005.

32. S. Premoze, T. Tasdizen, J. Bigler, A. Lefohn, R. Whitaker, "Particle-based simulation of fluids", *Proc. Eurographics' 2003*, pp. 401–410, 2003.

33. T. Tasdizen, R. Whitaker. "Cramer-Rao bounds for nonparametric surface reconstruction from range data", *Proc. Fourth Int. Conf. on 3-D Imaging and Modeling*, pp. 70–77. October, 2003.

34. T. Tasdizen, R. Whitaker. "Anisotropic diffusion of surface normals for feature preserving surface reconstruction", *Proc. Fourth Int.Conf. on 3-D Imaging and Modeling*, pp. 353–360. October, 2003.

35. A. Lefohn, J. Cates, R. Whitaker, "Interactive, GPU-based level sets for 3D segmentation", *Proc. Medical Imaging Computing and Computer-Assisted Intervention*, pp. 564–572, 2003.

36. G. Kindlmann, R. Whitaker, T. Tasdizen, T. Möller, "Curvature-based transfer functions for direct volume rendering: methods and applications", *Proc. IEEE Visualization*, pp. 513–520, 2003.

37. A. Lefohn, J. Kniss, C. Hansen, R. Whitaker, "Interactive deformation and visualization of level set surfaces using graphics hardware", *Proc. IEEE Visualization*, pp. 75–82, 2003.

38. T. Tasdizen, R. Whitaker, P. Burchard, S. Osher, "Geometric surface smoothing via anisotropic diffusion of normals", *Proc. IEEE Visualization*, pp. 125–132, 2002.

39. K. Museth, D. Breen, L. Zhukov, R. Whitaker, "Level-set segmentation from multiple non-uniform volume datasets", *Proc. IEEE Visualization*, pp. 179–186, 2002.

40. K. Museth, D. Breen, R. Whitaker, A. Barr, "Level-set surface editing operators", in *ACM SIGGRAPH*, pp. 330–338, 2002.

41. T. Yoo, M. Ackerman, W. Lorenson, W. Schroeder, V. Chalana, S. Aylward, D. Metaxas, R. Whitaker, "Engineering and algorithm design for an image processing API: A technical report on ITK—the Insight Toolkit", *Proc. 10th Annual Medicine Meets Virtual Reality (MMVR)*, pp. 586–592, 2002.

42. V. Elangovan, R. Whitaker, "From sinograms to surfaces: a direct approach to the segmentation of tomographic data", *Proc. Medical Image Computing and Computer-Assisted Intervention (MICCAI)*, pp. 213–223, 2001.

43. A. Gothandaraman, R. Whitaker, J. Gregor, "Total variation for the removal of blocking effects in DCT based encoding", *Proc. IEEE Int. Conf. on Image Processing*, pp. 455–458, 2001.

44. R. Whitaker, "Reconstructing terrain maps from dense range data", *Proc. IEEE Int. Conf. on Image Processing*, pp. 165–168, 2001.

45. R. Whitaker, X. Xue, "Variable-conductance, level-set curvature for image denoising", *Proc. IEEE Int. Conf. on Image Processing*, pp. 142–145, 2001.

46. D. Breen, S. Mauch, R. Whitaker, J. Mao "3D metamorphosis between different types of geometric models" Eurographics 2001 Proceedings, September 2001, pp. 36-48.

47. R. Whitaker, D. Breen, K. Museth and N. Soni, "A framework for level set segmentation of volume datasets", *Proc. Proceedings of ACM Int. Workshop on Volume Graphics*, pp. 159-168, 2001.

48. R. Whitaker, "Reducing aliasing artifacts in isosurfaces of binary volumes", *IEEE Volume Visualization And Graphics Symposium*, pp. 23–32, 2000.

49. R. Whitaker, J. Gregor, and P. Chen, "Indoor scene reconstruction from sets of noisy range images", *Second Int. Conf. on 3-D Digital Imaging and Modeling*, pp. 348–357, 1999.
50. D. Breen , S. Mauch , R. Whitaker, "3D scan conversion of CSG models into distance volumes", *The 1998 Symposium on Volume Visualization*, pp. 7-14, 1998.
51. R. Whitaker, D. Breen, "Level-set models for the deformation of solid objects", *in Proceedings of Implicit Surfaces '98 (Eurographics/Siggraph)*, pp. 19–35, 1998.
52. S. Burgiss, R. Whitaker, M. Abidi, "Range image segmentation through pattern analysis of the multi-scale wavelet transform", *Int. Work. on Image Analysis and Information Fusion*, pp. 167–174, 1997.
53. D. Elsner, R. Whitaker, M. Abidi, "A volumetric technique for 3-d modeling through fusing multiple noisy range images", *Int. Workshop on Image Analysis and Information Fusion*, pp. 405–416, 1997.
54. D. Koller, G. Klinker, E. Rose, D.E. Breen, R. Whitaker, M. Tuceryan, "Real-time vision-based camera tracking for augmented reality applications", *Proceedings of the ACM Symposium on Virtual Reality Software and Technology (VRST '97)*, pp. 87–94, 1997.
55. D. Koller, G. Klinker, E. Rose, D.E. Breen, R. Whitaker, M. Tuceryan, "Automated camera calibration and 3d egomotion estimation for augmented reality", *Proceedings of the 7th Int. Conf. on Computer Analysis of Images and Patterns (CAIP '97)*, pp. 109-206, 1997.
56. R. Whitaker, "Algorithms for implicit deformable models", *Fifth Int. Conf. on Computer Vision*, pp. 822–827, 1995.
57. R. Whitaker, C. Crampton, D. Breen, M. Tuceryan, E. Rose, "Object calibration for augmented reality", *Proc. Eurographics*, pp. 15–27, 1995.
58. K. Ahlers, D. Breen, C. Crampton, E. Rose, M. Tuceryan, R. Whitaker, D. Greer, "Distributed augmented reality for collaborative design", *Proc. Eurographics*, pp. 3–14, 1995.
59. E. Rose, D. Breen, K. Ahlers, C. Crampton, M. Tuceryan, R. Whitaker, D. Greer, "Annotating real-world objects using augmented vision", *Computer Graphics Int.* (R. Earnshaw and J. Vince Ed.), pp. 357–370, 1995.
60. R. Whitaker, "Volumetric deformable models: active blobs", *Visualization in Biomedical Computing* (R. Robb Ed.), pp. 122–134, 1994.
61. D. Breen, E. Rose, K. Ahlers, C. Crampton, M. Tuceryan, R. Whitaker, D. Greer, "An augmented vision system for industrial applications", *SPIE Conf. on Photonics for Industrial Applications*, Vol. 2351, pp. 345–359, 1994.
62. R. Whitaker, "Characterizing first and second-order patches using geometry-limited diffusion", *Information Processing in Medical Imaging* (H. Barrett and A. Gmitro Ed.), pp. 149–167, 1993.
63. R. Whitaker, S.M. Pizer, "Geometry-based image segmentation using anisotropic diffusion", *Shape in Picture: The Mathematical Description of Shape in Greylevel Images.* (Y-L 0, A. Toet, H. Heijmans, D. Foster, P. Meer, Ed.), 1993.
64. T. Yoo, S. Pizer, H. Fuchs, T. Cullip, J. Rhoades, R. Whitaker, "Achieving direct volume visualization with interactive semantic region selection", *Proc. IEEE Visualization*, pp. 58–67, 1991.
65. M. Levoy, R. Whitaker, "Gaze-directed volume rendering", *Proc. of ACM Symposium on Interactive 3D Graphics*, (also *Computer Graphics, 24(2)*, pp. 217–223, 1990.

Conference Proceedings—Abstract Review

1. H.B. Henninger, C.J. Underwood, R.T. Whitaker, S.A. Maas, J.A. Weiss, "Fine structure and orientation of sulfated glycosaminoglycans in human knee ligament", *Proc. 52nd Ann. Mtg. of the Orthopaedic Research Society*, 31:1115, 2006.
2. L. Zhukov, K. Museth, D. Breen, R. Whitaker, "3D modeling and segmentation of diffusion weighted MRI data", *Proc. of SPIE Medical Imaging 2001*, pp. 401-412, 2001.
3. S. Burgiss, E. Lester, R. Whitaker, M. Abidi, "Scene segmentation from vector-valued images using anisotropic diffusion", *SPIE Int. Conf. on Intelligent Robots and Computer Vision XVI: Algorithms, Techniques, Active Vision, and Materials Handling*, pp. 527–538, 1998.
4. A. Mangan, R. Whitaker, "Surface segmentation using morphological watersheds", *IEEE Visualization '98: Late Topics*, pp. 2932, 1998.
5. S. Burgiss, R. Whitaker, and M. Abidi, "Range image segmentation through pattern analysis of multi-scale difference information", *SPIE Int. Conf. on Intelligent Robots and Computer Vision XVI: Algorithms, Techniques, Active Vision, and Materials Handling*, pp. 374–381, 1997.
6. D. Elsner, R. Whitaker, M. Abidi, "3D model creation through volumetric fusion of multiple range images", *SPIE Int. Conf. on Intelligent Robots and Computer Vision XVI: Sensor Fusion and Decentralized Control in Autonomous Robotic Systems*, pp. 250–260, 1997.
7. E. Lester, R. Whitaker, M. Abidi, "Feature extraction, image segmentation, and scene reconstruction", *SPIE Int. Conf. on Intelligent Robots and Computer Vision XVI: Sensor Fusion and Decentralized Control in Autonomous Robotic Systems*, pp. 261–271, 1997.
8. R. Whitaker, D. Chen, "Embedded active surfaces for volume visualization", *SPIE Medical Imaging VIII* (2167), pp. 340–352, 1994.

Book Contributions

1. D. Breen, R. Whitaker, K. Museth, L. Zhukov, "Level set segmentation of biological volume datasets", in *Handbook of Medical Image Analysis, Volume I: Segmentation Part A*, (ed. J. Suri), Kluwer, 2005, pp. 415-478.
2. R. Whitaker, "Isosurfaces and level sets" in *Visualization Handbook* (eds. C. Johnson and C. Hansen), 2005.
3. R. Whitaker, "Nonlinear image filtering with partial differential equations" in *Insight into Images* (ed. T. Yoo), 2004.
4. R. Whitaker, "Isosurfaces and level sets" in *Insight into Images* (ed. T. Yoo), 2004.
5. K. Museth, D. Breen, A. Barr, R. Whitaker, "Geometric models editing within a level-set framework" in *Geometric Level Set Methods in Imaging, Vision, and Graphics*, (S. Osher, N. Paragios, Ed.) Springer Verlag, August 2002
6. D. Breen, S. Mauch, R. Whitaker, "3D scan conversion of csg models into distance, closest-point and color volumes", in *Volume Graphics* (M. Chen and A. Kaufman, Ed.), Springer, 1999.
7. R. Whitaker, G. Gerig, "Vector-valued diffusion", in *Geometry-Driven Diffusion* (B. ter Haar Romeny, Ed.), Kluwer 1994, pp. 93–134.
8. E. Rose, D. Breen, K. Ahlers, C. Crampton, M. Tuceryan, R. Whitaker, D. Greer, "Annotating real-world objects using augmented reality", in *Computer Graphics: Developments in Virtual Environments* (R. Earnshaw, J. Vince, Ed.), Academic Press 1995, pp. 357–370.

PROFESSIONAL SERVICE

Conference Organization

- General Cochair, *IEEE Visualization*, 2010 Salt Lake City, 2011 Providence.
- Organizing Committee (Workshops Chair), *IEEE Int. Symposium on Biomedical Imaging*, 2009, Boston.
- Cochair (Cofounder), *Microscopic Image Analysis with Applications in Biology*, 2006, Copenhagen.
- Cochair, *SIAM Imaging Science*, 2005, Salt Lake City.

Program Committees

- Eurographics, 2002.
- IEEE EuroVis 2009.
- IEEE Symposium on Volume Visualization, 2002, 2008.
- International Workshop Visualization and Mathematics, 2002 (Berlin).
- International Conference on Vision, Modeling, and Visualization, 2002.
- IEEE Conference on Virtual Reality, 1999, 2000, 2002, 2003.
- IEEE Conference on Visualization, 2003, 2004, 2005, 2006,2009.
- International Conference on Computer Vision and Pattern Recognition, 2004, 2005, 2006.
- International Conference on 3-D Digital Imaging and Modeling, 2005.
- Medical Image Analysis and Computer Aided Intervention (MICCAI), 2005, 2007, 2009.

Review Panels

- NSF, ITR (February 2002, June 2004)
- NSF, MSPA-MCS (June 2005)
- NIH, Human Brain Project (September 2004, June 2005, March 2006)
- NIH NIBIB, BRP Review Panel (February 2006, September)

Memberships

- IEEE Senior Member, IEEE Computer Society, ACM.

WORKSHOPS AND PROFESSIONAL COURSES

- "MeshMed", MICCAI 2011, (www.imm.dtu.dk/MeshMed)
- "Workshop on Computational Diffusion MRI", MICCAI, 2008.
- "Image Processing for Volume Graphics", SIGGRAPH, 2002.
- "Beyond Blobs", SIGGRAPH, 2002.
- "PDEs for Graphics and Image Processing", SIGGRAPH, 2002.
- "Image Processing for Volume Graphics", IEEE Visualization, 2002.
- "Image Processing for Volume Graphics", SIGGRAPH 2001.

- “Image Processing for Volume Graphics”, IEEE Visualization, 2001.
- “Multiscale Geometric Image Analysis—Diffusion and Cores”, Visualization in Biomedical Computing (VBC), 1994.

EDITORIAL BOARDS

- Associated Editor, *IEEE TVCG*, 2006–2011.
- Guest Editor, *Medical Image Analysis*, Special Issue on “Microscopy Image Analysis”, Jan, 2009.