

## SCOTT T. ACTON

### *Contact Information*

Dept. of Electrical and Computer Engineering  
Thornton Hall  
Charlottesville, VA 22904-4743  
Phone: (434) 924-2003 Fax: (434) 924-8818  
Email: acton@virginia.edu

### *Education*

Ph.D., Electrical Engineering, The University of Texas at Austin, 1993  
M.S., Electrical Engineering, The University of Texas at Austin, 1990  
B.S., Electrical Engineering, Virginia Tech, 1988

### *Broad Interests*

Image Processing / Biomedical Image Analysis

### *Specific Interests*

Research interests include biomedical tracking problems, biomedical image analysis, automated inspection, military tracking, object identification, classification and segmentation of multispectral imagery, and multimedia content-based retrieval. Interests in theory include diffusion algorithms, active contours, image morphology, scale space and image enhancement / restoration algorithms.

### *Professional Experience*

Professor, University of Virginia, 2005-  
Walter N. Munster Assoc. Prof. and Faculty Fellow, University of Virginia,  
2003-2005  
Joint Appointment in Biomedical Engineering, University of Virginia, 2002-  
Associate Professor, University of Virginia, Charlottesville, VA, 2000 - 2005  
Associate Professor, Oklahoma State University, Stillwater, OK, 1998 - 2000  
Asst. Professor, Oklahoma State University, Stillwater, OK, 1994 - 1997  
Postdoctoral Fellow, The Center for Space Research, Austin, TX, 1994  
Research Asst. (Motorola, Inc. grant), The Laboratory for Vision Systems,  
The University of Texas at Austin, Austin, TX, 1990 - 1993  
Research and Development Intern, Motorola, Inc., Phoenix, AZ, 1991  
Microelectronics and Computer Development Fellow, The University of  
Texas at Austin, Austin, TX, 1988 - 1990  
Member of the Technical Staff, The MITRE Corp., McLean, VA, 1988  
C<sup>3</sup>I Intern, The MITRE Corp., McLean, VA, 1985 - 1987  
Engineering Intern, AT&T Corp., Oakton, VA, 1982 - 1984

### ***Honors and Awards***

- Plenary Speaker, International Machine Vision and Image Processing Conference, 2008
- Visiting Professor, University of New Mexico, 2007-2008
- Darden Business Concept Contest Award, 2006
- Walter N. Munster Associate Professorship for Research in Intelligence Enhancement, 2003
- Faculty Fellow of the School of Engineering and Applied Science, 2003
- New Faculty Teaching Award, 2002
- Best Paper Award, IEEE International Conference on Image Processing, 2002 (with U.Va. student Nilanjan Ray)
- Whitaker Biomedical Engineering Research Grant, 2001
- **Outstanding Young Electrical Engineer**, 1996 (National award given by Eta Kappa Nu annually since 1936)
- Halliburton Outstanding Young Faculty Award, 1997 (Corporate-sponsored award for teaching and research excellence)
- Senior Member, IEEE, 1999
- Plenary Speaker, International Conference on Advances in Pattern Recognition and Digital Techniques, ICAPRDT '99, Calcutta, India
- Big 12 Faculty Fellowship, 1998 (Paid expenses for visiting research fellowship)
- Most Influential Professor, OSU Athletics, 1998
- Army Research Office **Young Investigator** Award, 1995
- Motorola Partnerships in Research Award, 1993
- Microelectronics and Computer Development Fellowship, 1988
- Member, Eta Kappa Nu Honorary Society, 1987
- Marshall Hahn Engineering Fellowship, 1985
- Virginia Scholar's Award, 1984

## ***Publications***

### **Books**

S.T. Acton and N. Ray, *Biomedical Image Analysis: Tracking*, Morgan and Claypool Publishers, 2006.

S.T. Acton and N. Ray, *Biomedical Image Analysis: Segmentation*, Morgan and Claypool Publishers, 2009.

### **Book Chapters**

S.T. Acton, "Diffusion partial differential equations for edge detection," in the *Handbook of Image and Video Processing*, Second Edition, Academic Press, 2005.

A.C. Bovik and S.T. Acton, "Basic linear filtering with application to image enhancement," in the *Handbook of Image and Video Processing*, Second Edition, Academic Press, 2005 (First Edition published in 2000).

M.S. Pattichis, J.P. Havlicek, S.T. Acton, and A.C. Bovik, "Multidimensional AM-FM models with image processing applications," in *Advances in Image Processing and Understanding*, World Scientific Publishing, 2002.

S.T. Acton, "Diffusion-based edge detectors," in the *Handbook of Image and Video Processing*, Academic Press, pp. 433-447, 2000.

S.T. Acton, D. Wei and A.C. Bovik, "Image enhancement," in the *Encyclopedia of Electrical and Electronics Engineering*, J. Webster (Ed.), John Wiley and Sons, New York, 1999.

S.T. Acton and A.C. Bovik, "Order statistics in image processing," in *Handbook of Statistics Volume 17: Order Statistics and Their Applications*, N. Balakrishnan and C.R. Rao (Eds.), Elsevier Science, New York, pp. 603-641, 1998.

A.C. Bovik and S.T. Acton, "The impact of order statistics on signal processing," in *Statistical Theory and Applications*, H.N. Nagaraja, P.K. Sen, and D.F. Morrison (Eds.), New York, Springer-Verlag, pp. 153-176, 1996.

**Refereed Journals**

- B. Li and S.T. Acton, "Automatic active model initialization via Poisson inverse gradient," *IEEE Transactions on Image Processing*, vol. 17, pp. 1406-1420, 2008.
- J. Cui, N. Ray, S.T. Acton and Z. Lin, "An affine invariance approach to cell tracking," *Computerized Medical Imaging and Graphics*, vol. 32, pp. 554-565, 2008.
- C.D. Garson, S.T. Acton and J.A. Hossack, "Guiding automated left ventricular chamber segmentation in cardiac imaging using the concept of conserved myocardial volume," accepted for publication, *Computerized Medical Imaging and Graphics*, 2008.
- P. Tay, B. Li, C.D. Garson, S.T. Acton and J.A. Hossack, "Left ventricle segmentation using model fitting and active surfaces," *Journal of Signal Processing Systems*, 2008.
- A. Aksel, J.A. Hossack and S.T. Acton, "ACU-SEG: Automated cardiac ultrasound image segmentation and tracking," *CSI Communications*, vol. 32, pp. 11-16, 2008.
- B. Li and S.T. Acton, "Active contour external force using vector field convolution for image segmentation," *IEEE Transactions on Image Processing*, vol. 16, pp. 2096-2097, 2007.
- D.P. Mukherjee and S.T. Acton, "Affine and projective active contour models," *Pattern Recognition*, vol. 40, pp. 920-930, 2007.
- G. Dong and S.T. Acton, "Detection of rolling leukocytes by marked point processes," *Journal of Electronic Imaging*, vol. 16, no. 3, 2007.
- M.S. Grant, S.T. Acton, S.J. Katzberg, "Terrain-moisture classification using GPS surface-reflected signals," *IEEE Geoscience and Remote Sensing Letters*, vol. 4, pp. 41-45, 2007.
- M. Sperandio, J. Pickard, S. Unnikrishnan, S.T. Acton and K. Ley, "Analysis of leukocyte rolling *in vivo* and *in vitro*," *Methods in Enzymology*, vol. 416, pp. 346-371, 2006.
- A.L. Klibanov, J.J. Rychak, W.C. Yang, B. Li, S.T. Acton, J.R. Lindner, K. Ley and S. Kaul, "A simple and efficient preparation of targeted ultrasound contrast agents for molecular imaging of inflammation in high-shear flow," *Contrast Media and Molecular Imaging*, vol. 1, pp. 259-266, 2006.
- S. Millington, B. Li, J. Tang, S. Trattnig, J.R. Crandall, S.R. Hurwitz, S.T. Acton,

- "Quantitative and topographical evaluation of ankle articular cartilage using high resolution MRI," *Journal of Orthopaedic Research*, vol. 25, pp. 143-151, 2006.
- J.J. Rychak, B. Li, S.T. Acton, A. Leppanen, R.D. Cummings, K. Ley, A.L. Klibanov, "Selectin ligands promote ultrasound contrast agent adhesion under shear flow," *Molecular Pharmaceuticals*, vol. 3, pp. 516-524, 2006.
- J. Cui, S.T. Acton and Z. Lin, "Tracking rolling leukocytes *in vivo* by factored sampling," *Medical Image Analysis*, vol. 10, pp. 598-610, 2006.
- G. Dong and S.T. Acton, "On the convergence of bilateral filter for edge-preserving image smoothing," accepted for publication, *IEEE Signal Processing Letters*, 2006.
- S. Millington, B. Li, J. Tang, S. Trattnig, J.R. Crandall, S.R. Hurwitz, S.T. Acton, "A quantitative study of human ankle articular cartilage and evaluation of ankle cartilage topography using high resolution cartilage sensitive MR imaging," *Osteoarthritis and Cartilage*, in press, 2006.
- S.R. Avula, J. Tang and S.T. Acton, "An object based image retrieval system for digital libraries," *Multimedia Systems Journal*, vol. 11, pp. 260-270, 2006.
- J. Tang, S. Millington, J.R. Crandall, S.R. Hurwitz and S.T. Acton, "Surface extraction and thickness measurement of the articular cartilage from MR images using directional gradient vector flow snakes," *IEEE Transactions on Biomedical Engineering*, vol. 53, pp. 896-907, 2006.
- S.T. Acton, F. Kishino, R. Nakatsu, J. Tang and M. Rauterberg, "Guest editorial: introduction to multimedia system technologies for educational tools," *Multimedia Systems Journal*, vol. 11, pp. 201-202, 2006.
- N. Ray and S.T. Acton, "Inclusion filters: a class of self-dual connected operators," *IEEE Transactions on Image Processing*, vol. 14, pp. 1736-1746, 2005.
- G. Dong, N. Ray and S.T. Acton, "Intravital leukocyte detection using the gradient inverse coefficient of variation," *IEEE Transactions on Medical Imaging*, vol. 24, pp. 910-924, 2005.
- N. Ray and S.T. Acton, "Data acceptance of automated leukocyte tracking through segmentation of spatiotemporal images," *IEEE Transactions on Biomedical Engineering*, vol. 52, pp. 1702-1712, 2005.

- S.T. Acton, "Snakes for tracking via generalized deterministic annealing," *Journal of Electronic Imaging*, vol. 14, 023017, pp. 1-13, 2005.
- A.K. Chattopadhyay, N. Ray and S.T. Acton, "Universality in the merging dynamics of parametric active contours: a study in MRI based lung segmentation," *New Journal of Physics*, vol. 7, pp. 148-159, 2005.
- A.P. Goobic, J. Tang and S.T. Acton, "Image stabilization and registration for tracking cells in the microvasculature," *IEEE Transactions on Biomedical Engineering*, vol. 52, pp. 287-289, 2005.
- Q. Sun, J. Hossack, J. Tang and S.T. Acton, "Speckle reducing anisotropic diffusion for 3-D ultrasound images," *Computerized Medical Imaging and Graphics*, vol. 8, pp. 461-470, 2004.
- N. Ray and S.T. Acton, "Motion gradient vector flow: an external force for tracking rolling leukocytes with shape and size constrained active contours," *IEEE Transactions on Medical Imaging*, vol. 23, pp. 1466-1478, 2004.
- Y. Yu, J. Molloy and S.T. Acton, "Segmentation of the prostate from suprapubic ultrasound images," *Medical Physics*, vol. 31, pp. 3474-3484, 2004.
- J. Dunne, A.P. Goobic, S.T. Acton and K. Ley, "A novel method to analyze leukocyte rolling behavior *in vivo* in the mouse cremaster muscle using intravital microscopy," *Biological Procedures*, vol. 6, 182-189, 2004.
- Y. Yu and S.T. Acton, "Edge detection in ultrasound imagery using the instantaneous coefficient of variation," *IEEE Transactions on Image Processing*, vol. 13, pp. 1640-1655, 2004.
- J. Tang and S.T. Acton, "Vessel boundary tracking for intravital microscopy via multi-level gradient vector flow snakes," *IEEE Transactions on Biomedical Engineering*, vol. 51, pp. 316-324, 2004.
- S. Jeyamkondan, N. Ray, G.A. Kranzler, and S.T. Acton, "Computer vision segmentation of the *longissimus dorsi* for beef quality grading," *Transactions of the ASAE*, vol. 47, pp. 1261-1268, 2004.
- M.E. Welser and S.T. Acton, "Projection model snakes for tracking using a Monte Carlo

- approach," *Journal of Electronic Imaging*, vol. 13, pp. 384-398, 2004.
- D.P. Mukherjee, S. Maitra, and S.T. Acton, "Spatial domain digital watermarking of multimedia objects for buyer authentication," *IEEE Transactions on Multimedia*, vol. 6, pp. 1-15, 2004.
- J. Tang, S.R. Avula and S.T. Acton, "A decentralized image retrieval system for National STEM Digital Library," *Information Technology and Libraries*, vol. 23, pp. 9-15, 2004.
- K. Weber and S.T. Acton, "On connected filters in color image processing," *Journal of Electronic Imaging*, vol. 13, no. 7, 2004.
- A.-R. Mansouri, D.P. Mukherjee and S.T. Acton, "Constraining active contour evolution via Lie groups of transformation," *IEEE Transactions on Image Processing*, vol. 13, pp. 853-863, 2004.
- D.P. Mukherjee, N. Ray, and S.T. Acton, "Level set analysis for cell detection and tracking," *IEEE Transactions on Image Processing*, vol. 13, 562-572, 2004.
- Y. Yu and S.T. Acton, "Automated delineation of coastline from polarimetric SAR imagery," *International Journal of Remote Sensing*, vol. 25, pp. 3423-3438, 2004.
- N. Ray, S.T. Acton, T. Altes, E.E. de Lange, and J.R. Brookeman, "Merging parametric active contours within homogeneous image regions for MRI based lung segmentation," *IEEE Transactions on Medical Imaging*, vol. 22, pp. 189-199, 2003.
- J.H. Bosworth and S.T. Acton, "Morphological scale-space in image processing," *Digital Signal Processing*, vol. 13, pp. 338-367, 2003.
- J. Tang and S.T. Acton, "Locating human faces in a complex background including non-face skin colors," *Journal of Electronic Imaging*, vol. 12, pp. 423-430, 2003.
- J.H. Bosworth, T. Koshimizu and S.T. Acton, "Multi-resolution segmentation of soil moisture imagery by watershed pyramids with region merging," *Int. Journal of Remote Sensing*, vol. 24, pp. 741-760, 2003.
- J. Tang, E. Peli, and S.T. Acton, "Image enhancement using a contrast measure in the compressed domain," *IEEE Signal Processing Letters*, vol. 10, pp. 289-292, 2003.

- N. Ray, S.T. Acton, and K. Ley, "Tracking leukocytes *in vivo* with shape and size constrained active contours," *IEEE Transactions on Medical Imaging*, vol. 21, pp. 1222-1235, 2002 (Special issue on *Image Analysis in Drug Discovery and Clinical Trials*).
- Y. Yu and S.T. Acton, "Speckle reducing anisotropic diffusion," *IEEE Transactions on Image Processing*, vol. 11, pp. 1260-1270, 2002.
- D.P. Mukherjee and S.T. Acton, "Cloud tracking by scale space classification," *IEEE Transactions on Geoscience and Remote Sensing*, vol. 40, pp. 405-415, 2002.
- S.T. Acton, K. Wethmar, and K. Ley, "Automatic tracking of leukocytes *in vivo*," *Microvascular Research*, vol. 63, pp. 139-148, 2002.
- S.T. Acton, D.P. Mukherjee, J.P. Havlicek, and A.C. Bovik, "Oriented texture completion by AM-FM reaction-diffusion," *IEEE Transactions on Image Processing*, vol. 10, pp. 885-896, 2001.
- S.T. Acton, "Fast algorithms for area morphology," *Digital Signal Processing*, vol. 11, pp. 187-203, 2001.
- S.T. Acton, "Locally monotonic diffusion," *IEEE Transactions on Signal Processing*, vol. 48, pp. 1379-1389, 2000.
- S.T. Acton and D.P. Mukherjee, "Area operators for edge detection," *Pattern Recognition Letters*, vol. 21, pp. 771-777, 2000.
- S.T. Acton and D.P. Mukherjee, "Scale space classification using area morphology," *IEEE Transactions on Image Processing*, vol. 9, pp. 623-635, 2000.
- S.T. Acton and A.C. Bovik, "Segmentation by locally monotonic reduction," *Journal of Applied Signal Processing*, vol. 6, pp. 42-54, 1999.
- S.T. Acton and A.C. Bovik, "Piecewise and local image models for regularized image restoration using cross validation," *IEEE Transactions on Image Processing*, vol. 8, pp. 652-665, 1999.
- C.A. Segall, W. Chen, and S.T. Acton, "Video tracking using the morphological pyramid," *Journal of Electronic Imaging*, vol. 8, pp. 176-184, April, 1999. Reprinted in *Selected SPIE Papers: Mathematical Imaging and Vision*, G. Ritter (Ed.),

Bellingham, WA, 1999.

S.T. Acton and A.C. Bovik, "Nonlinear image estimation using piecewise and local image models," *IEEE Trans. on Image Processing*, vol. 7, pp. 979-991, 1998.

S.T. Acton, "Multigrid anisotropic diffusion," *IEEE Transactions on Image Processing*, vol. 7, pp. 280-291, 1998.

S.T. Acton, "On fuzzy nonlinear regression for image enhancement," *Journal of Mathematical Imaging and Vision*, vol. 8, pp. 239-253, 1998.

S.T. Acton, "Image restoration using generalized deterministic annealing," *Digital Signal Processing*, vol. 7, pp. 94-104, 1997.

S.T. Acton and J. Landis, "Multispectral anisotropic diffusion," *Int. Journal of Remote Sensing*, vol. 18, pp. 2877-2886, 1997.

S.T. Acton and A.C. Bovik, "Generalized deterministic annealing," *IEEE Trans. on Neural Networks*, vol. 7, pp. 686-699, 1996.

S.T. Acton, "On unsupervised segmentation of remotely sensed imagery using nonlinear regression," *Int. Journal of Remote Sensing*, vol. 17, pp. 1407-1415, 1996.

S.T. Acton and A.C. Bovik, "Feature classification techniques in model-based object recognition," *Int. Journal of Imaging Systems and Technologies*, vol. 2, pp. 329-344, 1990.

P. Tay, S.T. Acton, and J.A. Hossack, "Iterative noise reduction," *Digital Signal Processing*, submitted for publication, 2007.

A.D. Gilliam, F.H. Epstein and S.T. Acton, "Cardiac motion recovery via active trajectory motion models," under revision for publication, *IEEE Transactions on Information Technology in Biomedicine*, 2008.

R.L. Janiczek, B.D. Gelfand, R.J. Roy, S.T. Acton, B.R. Blackman and F.H. Epstein, "Wall shear stress in the mouse aortic arch measured with MRI: methods to correlate hemodynamics with atherogenic regions," submitted to *Arteriosclerosis, Thrombosis, and Vascular Biology*, 2007.

K.R. Prasad, Y. Xu, Z. Yang, S.T. Acton, S.S. Berr and B.A. French, "Truly efficient

cardiac-specific gene expression using pseudotyped AAV vectors in combination with the cardiac troponin-T promoter,” submitted to *Molecular Therapy*, 2008.

### **Conference Proceedings (Refereed)**

S.T. Acton and A. Rossi, “Matching and retrieval of tattoo images: active contour CBIR and global image features,” *Proc. IEEE Southwest Symposium on Image Analysis and Interpretation*, Santa Fe, New Mexico, March 24-26, 2008.

S.T. Acton, A.D. Gilliam, B. Li and A. Rossi, “Content based image retrieval for matching images of improvised explosive devices in which snake initialization is viewed as an inverse problem,” *Proc. SPIE Electronic Imaging*, January 28-29, 2008.

C. Garson, J.A. Hossack, B. Li and S.T. Acton, “Guided automatic segmentation of murine left ventricle using conservation of myocardial volume,” *Proc. IEEE Int. Ultrasonics Symposium*, New York, New York, October 23-26, 2007.

Y. Li, C. Garson, Y. Xu, S.T. Acton, B. French, J.A. Hossack, “Quantification of cardiac dyssynchrony in mice after myocardial infarction using high resolution ultrasound,” *Proc. IEEE International Symposium of Biomedical Imaging*, Arlington, Virginia, April 12-15, 2007.

A.D. Gilliam and S.T. Acton, “Echocardiographic simulation for validation of automated segmentation algorithms,” *Proc. IEEE Int. Conf. on Image Processing*, San Antonio, Texas, September 16-19, 2007.

S. Basu, D.P. Mukherjee and S.T. Acton, “Implicit evolution of open-ended curves,” *Proc. IEEE Int. Conf. on Image Processing*, San Antonio, Texas, September 16-19, 2007.

B. Li, A.V. Patil, J.A. Hossack and S.T. Acton, “3D Segmentation of the prostate via Poisson inverse gradient initialization,” *Proc. IEEE Int. Conf. on Image Processing*, San Antonio, Texas, September 16-19, 2007.

P. Tay, B. Li, C.D. Garson, S.T. Acton and J.A. Hossack, “Multidimensional segmentation of a mouse left ventricle,” *Proc. IEEE Ultrasonics Symposium*, Vancouver, British Columbia, October 2-6, 2006.

J. Cui, S.T. Acton and Z. Lin, “Particle filter tracking of multiple leukocytes *in vivo*,” *Asilomar Conf. on Signals, Systems and Computers*, Pacific Grove, California,

October 29 - November 1, 2006.

- B. Li, S.A. Millington, D.D. Anderson and S.T. Acton, "Registration of surfaces to 3D images using rigid body surfaces," *Asilomar Conf. on Signals, Systems and Computers*, Pacific Grove, California, October 29 - November 1, 2006.
- A.D. Gilliam, J.A. Hossack and S.T. Acton, "Freehand 3D ultrasound volume reconstruction via sub-pixel phase correlation," *Proc. IEEE Int. Conf. on Image Processing*, Atlanta, Georgia, October 8-11, 2006.
- B. Li and S.T. Acton, "Vector field convolution for image segmentation using snakes," *Proc. IEEE Int. Conf. on Image Processing*, Atlanta, Georgia, October 8-11, 2006.
- A. Aksel, R.L. Janiczek, J.A. Hossack and S.T. Acton, "Ultrasound myocardial tracking with speckle reducing anisotropic diffusion assisted initialization," *Proc. IEEE Int. Conf. on Image Processing*, Atlanta, Georgia, October 8-11, 2006.
- P. Tay, S.T. Acton and J.A. Hossack, "Ultrasound despeckling using an adaptive window stochastic approach," *Proc. IEEE Int. Conf. on Image Processing*, Atlanta, Georgia, October 8-11, 2006.
- B. Li and S.T. Acton, "Feature weighted active contours", *Proc. IEEE Southwest Symposium on Image Analysis and Interpretation*, Denver, Colorado, March 26-28, 2006.
- J. Cui, N. Ray, S.T. Acton, and Z. Lin, "Application of the affine invariant transform model to cell tracking", *Proc. IEEE Southwest Symposium on Image Analysis and Interpretation*, Denver, Colorado, March 26-28, 2006.
- P. Tay, S.T. Acton and J. Hossack, "A transform method to remove ultrasound artifacts", *Proc. IEEE Southwest Symposium on Image Analysis and Interpretation*, Denver, Colorado, March 26-28, 2006.
- S. Sahoo, N. Ray and S.T. Acton, "Rolling leukocyte detection based on teardrop shape and the gradient inverse coefficient of variation," *Proc. Int. Conf. on Medical Information Visualization*, pp. 29-33, 2006.
- P. Tay, S.T. Acton and J. Hossack, "A stochastic approach to ultrasound despeckling," *Proc. IEEE Int. Symp. On Biomedical Imaging*, Arlington, Virginia, April 6-9, 2006.

- R.L. Janiczek, A.D. Gilliam, P. Antkowiak, S.T. Acton and F.H. Epstein, "Automated affine registration of first pass magnetic images," *Asilomar Conf. on Signals, Systems and Computers*, Pacific Grove, California, October 30 - November 2, 2005.
- B. Li, P. Tay and S.T. Acton, "Multi-assignment interacting multiple model for tracking microbubbles," *Asilomar Conf. on Signals, Systems and Computers*, Pacific Grove, California, October 30 - November 2, 2005.
- G. Dong and S.T. Acton, "Object identification by marked point process," *Asilomar Conf. on Signals, Systems and Computers*, Pacific Grove, California, October 30 - November 2, 2005.
- J. Pickard, J. Hossack and S.T. Acton, "The effect of initialization and registration on the active shape segmentation of the myocardium in contrast enhanced ultrasound," *Proc. 2005 IEEE International Ultrasonics Symposium*, Rotterdam, The Netherlands, September 18-21, 2005.
- S.T. Acton, "Deconvolutional speckle reducing anisotropic diffusion," *Proc. IEEE Int. Conf. on Image Processing*, Genoa, Italy, September 11-14, 2005.
- N. Ray, G. Dong and S.T. Acton, "Tracking multiple cells by correspondence resolution in a sequential Bayesian framework," *Proc. IEEE Int. Conf. on Image Processing*, Genoa, Italy, September 11-14, 2005.
- R.L. Janiczek, N. Ray, B. French, F. Epstein and S.T. Acton, "Markov chain Monte Carlo method for tracking myocardial borders" *SPIE Computational Imaging III*, San Jose, California, January 17-18, 2005.
- N. Ray and S.T. Acton, "Spatiotemporal segmentation for validation of rolling leukocyte tracking data," *IEEE Conf. on Acoustics, Speech, and Signal Processing*, Philadelphia, Pennsylvania, March 19-23, 2005.
- R.L. Janiczek, J. Tang and S.T. Acton, "Incorporating variance within binary flow for leukocyte tracking," *Asilomar Conf. on Signals, Systems and Computers*, Pacific Grove, California, November 7-10, 2004.
- G. Dong, N. Ray and S.T. Acton, "Automated leukocyte detection *in vivo*," *Asilomar Conf. on Signals, Systems and Computers*, Pacific Grove, California, November 7-10, 2004.
- J. Pickard, R.L. Janiczek, S.T. Acton, J. Sklenar, J. Hossack and S. Kaul, "Segmentation

of the myocardium from myocardial contrast echocardiography," *Asilomar Conf. on Signals, Systems and Computers*, Pacific Grove, California, November 7-10, 2004.

G. Dong, E. Damiano, M.L. Smith, K. Ley and S.T. Acton, "Detection of microspheres in venules for automated particle image velocimetry," *IEEE Symposium on Computer Based Medical Systems*, Bethesda, Maryland, June 24-25, 2004.

J. Tang, S. Millington, S.T. Acton, J. Crandall and S. Hurwitz, "Ankle cartilage surface tracking using directional gradient vector flow snakes," *IEEE Int. Conf. on Image Processing*, Singapore, October 24-27, 2004.

Y. Yu, S.T. Acton and J. Molloy, "Generalized speckle reducing anisotropic diffusion for ultrasound imagery," *IEEE Symposium on Computer Based Medical Systems*, Bethesda, Maryland, June 24-25, 2004.

J. Tang and S.T. Acton, "A DCT based gradient vector flow snake for image segmentation", *Proc. IEEE Southwest Symposium on Image Analysis and Interpretation*, Lake Tahoe, Nevada, March 28-30, 2004.

N. Ray and S.T. Acton, "Tracking rolling leukocytes with motion gradient vector flow," *Proc. 37<sup>th</sup> Asilomar Conf. on Signals, Systems and Computers*, Pacific Grove, California, November 9-12, 2003.

Y. Yu and S.T. Acton, "Three-dimensional speckle reducing anisotropic diffusion," *Proc. 37<sup>th</sup> Asilomar Conf. on Signals, Systems and Computers*, Pacific Grove, California, November 9-12, 2003.

J. Havlicek, J. Tang, S.T. Acton, R. Antonucci and F. Ouandji, "Modulation domain texture retrieval for CBIR in digital libraries," *Proc. 37<sup>th</sup> Asilomar Conf. on Signals, Systems and Computers*, Pacific Grove, California, November 9-12, 2003.

F. Xu, Y. Yu, S.T. Acton and J. Hossack, "Detection of myocardial boundaries from ultrasound imagery using active contours," *IEEE Int. Ultrasonics Symposium*, Honolulu, Hawaii, October 5-8, 2003.

G. Dong and S.T. Acton, "A variational method for leukocyte detection," *Proc. IEEE Int. Conf. on Image Processing*, Barcelona, September 14-17, 2003.

Y. Yu and S.T. Acton, "Active contours with area-weighted binary flows for segmenting low SNR imagery," *Proc. IEEE Int. Conf. on Image Processing*, Barcelona,

September 14-17, 2003.

- N. Ray and S.T. Acton, "Self-dual inclusion filters," *Proc. IEEE Int. Conf. on Image Processing*, Barcelona, September 14-17, 2003.
- S.R. Avula, J. Tang and S.T. Acton, "Image retrieval using segmentation," *Proc. IEEE Systems & Information Engineering Design Symposium*, Charlottesville, Virginia, April 24-25, 2003.
- J. Tang and S.T. Acton, "A decentralized image retrieval system for education," *Proc. IEEE Systems & Information Engineering Design Symposium*, Charlottesville, Virginia, April 24-25, 2003.
- N. Ray and S.T. Acton, "Tracking fast-rolling leukocytes *in vivo* with active contours," *Proc. of the IEEE Int. Conference on Image Processing*, Rochester, New York, September 22-25, 2002 (**Best paper award**).
- D.P. Mukherjee, P.P. Mohanta and S.T. Acton, "Agglomerative clustering of feature data for image segmentation," *Proc. of the IEEE Int. Conference on Image Processing*, Rochester, New York, September 22-25, 2002.
- N. Ray and S.T. Acton, "Active contours for cell tracking," *Proc. IEEE Southwest Symposium on Image Analysis and Interpretation*, Santa Fe, New Mexico, April 7-9, 2002.
- P. Mohanta, D.P. Mukherjee and S.T. Acton, "Agglomerative clustering for image segmentation," *Proc. ICPR'02*, Quebec, Canada, August 11-15, 2002.
- S.T. Acton and K. Ley, "Tracking leukocytes from *in vivo* video microscopy using morphological anisotropic diffusion," *Proc. IEEE Int. Conf. on Image Processing*, Thessaloniki, Greece, October 7-10, 2001.
- Y. Yu, S.T. Acton and K. Thornton, "Detection of radioactive seeds in ultrasound images of the prostate," *Proc. IEEE Int. Conf. on Image Processing*, Thessaloniki, Greece, October 7-10, 2001.
- N. Ray, S.T. Acton, T. Altes and E.E. de Lange, "Ventilation analysis by merging parametric active contours within MRI imagery," *Proc. IEEE Int. Conf. on Image Processing*, Thessaloniki, Greece, October 7-10, 2001.

- N. Ray, J.P. Havlicek, S.T. Acton and M. Pattichis, "Active contour segmentation guided by AM-FM dominant component analysis," *Proc. IEEE Int. Conf. on Image Processing*, Thessaloniki, Greece, October 7-10, 2001.
- S.T. Acton, "A pyramidal algorithm for area morphology," *Proc. IEEE Int. Conf. on Image Processing*, Vancouver, Canada, Sept. 10-13, 2000.
- Y. Yu and S.T. Acton, "Polarimetric SAR data segmentation using texture partitioning and statistical analysis," *Proc. IEEE Int. Conf. on Image Processing*, Vancouver, Canada, Sept. 10-13, 2000.
- B. Raghunathan and S.T. Acton, "Area morphological segmentation for content-based retrieval," *Proc. IEEE Int. Conf. on Image Processing*, Vancouver, Canada, Sept. 10-13, 2000.
- S.T. Acton and D.P. Mukherjee, "Image edges from area morphology," *Proc. of the IEEE Int. Conf. on Acoustics, Speech and Signal Processing (ICASSP-2000)*, Istanbul, Turkey, June 5-9, 2000.
- J.H. Bosworth and S.T. Acton, "Segmentation-based coding by morphological local monotonicity," *Proc. Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, California, October 29 – November 1, 2000.
- J. Ahmed, J. Bosworth and S.T. Acton, "Image segmentation techniques for object-based coding," *Proc. IEEE Southwest Symposium on Image Analysis and Interpretation*, Austin, Texas, April 2-4, 2000.
- B. Raghunathan and S.T. Acton, "Content based retrieval for remotely sensed imagery," *Proc. IEEE Southwest Symposium on Image Analysis and Interpretation*, Austin, Texas, April 2-4, 2000.
- Z. Hu and S.T. Acton, "Morphological pyramid image registration," *Proc. IEEE Southwest Symposium on Image Analysis and Interpretation*, Austin, Texas, April 2-4, 2000.
- S.T. Acton and A. Restrepo (Palacios), "Locally monotonic models for image and video processing," *Proc. IEEE Int. Conf. on Image Processing*, Kobe, Japan, Oct. 25-29, 1999.
- J.H. Bosworth and S.T. Acton, "The morphological lomo filter for multiscale image

- processing," *Proc. IEEE Int. Conf. on Image Processing*, Kobe, Japan, Oct. 25-29, 1999.
- B. Raghunathan and S.T. Acton, "A content based retrieval engine for circuit board inspection," *Proc. IEEE Int. Conf. on Image Processing*, Kobe, Japan, Oct. 25-29, 1999.
- C.A. Segall, S.T. Acton and A.K. Katsaggelos, "Sampling conditions for anisotropic diffusion," *Proc. of the SPIE Symposium on Visual Communications and Image Processing*, San Jose, January 23-29, 1999.
- A. Restrepo (Palacios) and S.T. Acton, "2-D binary locally monotonic regression," *Proc. of the IEEE Int. Conf. on Acoustics, Speech and Signal Processing (ICASSP-99)*, Phoenix, March 14-19, 1999.
- J.H. Bosworth and S.T. Acton, "Morphological image segmentation by local monotonicity," *Proc. Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, California, October 24-27, 1999.
- C.A. Segall and S.T. Acton, "Adaptive templates in scale-space," *Proc. of the SPIE Conference on Real-time Imaging (part of Photonics West)*, San Jose, January 23-29, 1999.
- D.P. Mukherjee and S.T. Acton, "On disocclusion of fingerprint images," *Proc. International Conference on Advances in Pattern Recognition*, Calcutta, India, Dec. 27-29, 1999.
- S.T. Acton, "Anisotropic diffusion and local monotonicity," *Proc. of the IEEE Int. Conf. on Acoustics, Speech and Signal Processing (ICASSP-98)*, Seattle, May 12-15, 1998.
- C.A. Segall and S.T. Acton, "Gradient independent translation via differential morphology," *Proc. of the IEEE Int. Conference on Image Processing*, Chicago, October 4-7, 1998.
- S.T. Acton, "A PDE technique for generating locally monotonic images," *Proc. of the IEEE Int. Conference on Image Processing*, Chicago, October 4-7, 1998.
- W. Chen and S.T. Acton, "Morphological pyramids for multiscale edge detection," *Proc. of the IEEE Southwest Symposium on Image Analysis and Interpretation*, Tucson, April 6-7, 1998.

- J.H. Bosworth, T. Koshimizu and S.T. Acton, "Automated segmentation of surface soil moisture from Landsat TM data," *Proc. of the IEEE Southwest Symposium on Image Analysis and Interpretation*, Tucson, April 6-7, 1998.
- K. Pope and S.T. Acton, "Modified mean curvature motion for multispectral anisotropic diffusion," *Proc. of the IEEE Southwest Symposium on Image Analysis and Interpretation*, Tucson, April 6-7, 1998.
- C.A. Segall and S.T. Acton, "Morphological anisotropic diffusion," *Proc. of the IEEE Int. Conference on Image Processing*, Santa Barbara, Ca., October 26-29, 1997.
- A. Wright and S.T. Acton, "Watershed pyramids for edge detection," *Proc. of the IEEE Int. Conference on Image Processing*, Santa Barbara, Ca., October 26-29, 1997.
- B. Maguire, Jr., J.C. Lang, S.L. Anthony, C.T. Gorham, J.R. Reichman, S.T. Acton, and C.A. Segall, "Analysis of Coral: Quantitative Color," *8th International Coral Reef Symposium*, Panama City, Panama, H. A. Lessios, ed., July, 1996.
- M.C. Burton and S.T. Acton, "Target tracking using the anisotropic diffusion pyramid," *Proc. of the IEEE Southwest Symposium on Image Analysis and Interpretation*, San Antonio, April 8-9, 1996.
- W. Chen and S.T. Acton, "Processing issues in the automated inspection of power insulators," *Proc. of the IEEE Southwest Symposium on Image Analysis and Interpretation*, San Antonio, April 8-9, 1996.
- K.A. Davis, S.T. Acton, and B.J. Ackerson, "Segmentation of colloidal crystal images by local histogram analysis," *Proc. of the IEEE Southwest Symposium on Image Analysis and Interpretation*, San Antonio, April 8-9, 1996.
- S.T. Acton, "Edge enhancement of infrared imagery by way of the anisotropic diffusion pyramid," *Proc. of the IEEE Int. Conference on Image Processing*, Lausanne, Switzerland, September 16 - 19, 1996.
- S.T. Acton, "A pyramidal edge detector based on anisotropic diffusion," *Proc. of the IEEE Int. Conf. on Acoustics, Speech and Signal Processing (ICASSP-96)*, Atlanta, May 7-10, 1996.
- A. Yaicharoen and S.T. Acton, "A hybridized edge preservation coefficient for

anisotropic diffusion," *Proc. of the SPIE Symposium on Visual Communications and Image Processing (VCIP-96)*, Orlando, March 17-20, 1996.

S.T. Acton and A.C. Bovik, "Piecewise and local class models for image restoration," *Proc. of the IEEE Int. Conference on Image Processing*, Austin, Texas, November 13 - 16, 1994.

S.T. Acton, A.C. Bovik and M.M. Crawford, "Anisotropic diffusion pyramids for image segmentation," *Proc. of the IEEE Int. Conference on Image Processing*, Austin, Texas, November 13 - 16, 1994.

S.T. Acton and A.C. Bovik, "Image segmentation via piecewise constant regression," *Proc. of the SPIE Symposium on Visual Communications and Image Processing (VCIP-94)*, Chicago, September 25 - 28, 1994.

S.T. Acton and A.C. Bovik, "Nonlinear regression for image enhancement via generalized deterministic annealing," *Proc. of the SPIE Symposium on Visual Communications and Image Processing (VCIP-93)*, Boston, November 7-12, 1993.

S.T. Acton, A.C. Bovik, and J. Ghosh, "Generalized deterministic annealing," *Proc. of the World Congress on Neural Networks*, Portland, Oregon, July 11-15, 1993.

S.T. Acton, J. Ghosh, and A.C. Bovik, "Fast combinatorial optimization using generalized deterministic annealing," *Proc. of the SPIE Conf. on the Science of Artificial Neural Networks (part of OE/Aerospace Science and Sensing)*, Orlando, Florida, April 12-16, 1993.

S.T. Acton and A.C. Bovik, "Anisotropic edge detection using mean field annealing," *Proc. of the IEEE Int. Conf. on Acoustics, Speech and Signal Processing (ICASSP-92)*, San Francisco, March 23-26, 1992.

S.T. Acton and M.M. Crawford, "A mean field solution to anisotropic edge detection of remotely sensed images," *Proc. of the IEEE Int. Geoscience and Remote Sensing Symposium*, Houston, Texas, May 26-20, 1992.

W.N. Klarquist, S.T. Acton, and J. Ghosh, "Mean field stereo correspondence for natural images," *Proc. of the SPIE Symposium on Electronic Imaging Science and Technology*, San Jose, February 24 - March 1, 1991.

S.T. Acton and A.C. Bovik, "GRUPO: A 3-D structure recognition system," *Proc. of the*

*SPIE Symposium on Visual Communications and Image Processing (VCIP-90),  
Lausanne, Switzerland, October 2-4, 1990.*

**Conference Proceedings (Invited)**

- S. Basu and S.T. Acton, "Navigation and estimation of shape variation on a shape manifold for anatomical segmentation," *Asilomar Conf. on Signals, Systems and Computers*, Pacific Grove, California, October 27-30, 2008.
- N. Ray, B. Saha and S.T. Acton, "Oil sand image segmentation using the inclusion filter," *Proc. IEEE Conf. on Image Processing*, San Diego, California, September, 2008.
- S.T. Acton, P. Soliz, M.S. Pattichis, "Content based image retrieval for retinal images," *Proc. IEEE Int. Conf. on Multimedia and Expo*, Hannover, Germany, June 23-26, 2008.
- A.D. Gilliam and S.T. Acton, "Murine spatiotemporal cardiac segmentation," *Asilomar Conf. on Signals, Systems and Computers*, Pacific Grove, California, November 4-7, 2007.
- S. Basu and S.T. Acton, "Manifold learning for high content screening with automated cell segmentation," *Asilomar Conf. on Signals, Systems and Computers*, Pacific Grove, California, November 4-7, 2007.
- W. Wu, S.T. Acton and J.C. Lach, "Real-time processing of ultrasound images with speckle reducing anisotropic diffusion," *Asilomar Conf. on Signals, Systems and Computers*, Pacific Grove, California, October 29 - November 1, 2006.
- A. Aksel, A.D. Gilliam, J.A. Hossack and S.T. Acton, "Speckle reducing anisotropic diffusion for echocardiography," *Asilomar Conf. on Signals, Systems and Computers*, Pacific Grove, California, October 29 - November 1, 2006.
- J.E. Pickard, J.A. Hossack and S.T. Acton, "Shape model segmentation of long-axis contrast enhanced echocardiography," *Proc. IEEE Int. Symp. On Biomedical Imaging*, Arlington, Virginia, April 6-9, 2006.
- S.T. Acton and N. Ray, "Detection and tracking of rolling leukocytes from intravital microscopy," *Proc. IEEE Int. Symp. On Biomedical Imaging*, Arlington, Virginia, April 15-18, 2004.
- J. Tang and S.T. Acton, "An image retrieval algorithm using multiple query images," *Proc. Int. Symp. On Signal Processing and Its Applications*, Paris, France, July 3-6,

2003.

- J. Tang, G. Dong, N. Ray and S.T. Acton, "Evaluation of intravital tracking algorithms," *Proc. 45<sup>th</sup> Midwest Symposium on Circuits and Systems*, Tulsa, Oklahoma, August 5-7, 2002.
- D.P. Mukherjee and S.T. Acton, "Conditional anisotropic diffusion for leukocyte identification," *Proc. 45<sup>th</sup> Midwest Symposium on Circuits and Systems*, Tulsa, Oklahoma, August 5-7, 2002.
- N. Ray and S.T. Acton, "Adaptive image processing via snake filters," *Proc. 35<sup>th</sup> Asilomar Conf. on Signals, Systems and Computers*, Pacific Grove, California, November 4-7, 2001.
- Y. Yu and S.T. Acton, "Segmentation of ultrasound imagery using anisotropic diffusion," *Proc. 35<sup>th</sup> Asilomar Conf. on Signals, Systems and Computers*, Pacific Grove, California, November 4-7, 2001.
- A. Goobic, M. Welser, S.T. Acton and K. Ley, "Biomedical application of target tracking in clutter," *Proc. 35<sup>th</sup> Asilomar Conf. on Signals, Systems and Computers*, Pacific Grove, California, November 4-7, 2001.
- J. Tang and S.T. Acton and D.P. Mukherjee, "Retrieving similar images in image databases using relational matrices," *Proc. 45<sup>th</sup> Midwest Symposium on Circuits and Systems*, Tulsa, Oklahoma, August 5-7, 2002.
- N. Ray and S.T. Acton, "Image segmentation by curve evolution with clustering," *Proc. 34<sup>th</sup> Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, California, October 29 – November 1, 2000.
- B. Raghunathan and S.T. Acton, "Image segmentation by level set analysis," *Proc. 34<sup>th</sup> Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, California, October 29 – November 1, 2000.
- S.T. Acton, "Diffusion based image and video processing," *Proc. International Conference on Advances in Pattern Recognition*, Calcutta, India, Dec. 27-29, 1999.
- D.P. Mukherjee and S.T. Acton, "Document page segmentation using multiscale clustering," *Proc. IEEE Int. Conf. on Image Processing*, Kobe, Japan, Oct. 25-29, pp. 234-238, 1999.

C.A. Segall and S.T. Acton, "Multi-scale video tracking," *Workshop on the Detection and Classification of Difficult Targets*, Redstone Arsenal, Huntsville, AL, June 9-10, 1998.

C.A. Segall, W. Chen, and S.T. Acton, "Nonlinear pyramids for object identification," *Proc. 30<sup>th</sup> Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, California, Nov. 3-6, 1996.

### **Conference Proceedings (Abstract Only)**

P. Soliz, V. Murray, M.S. Pattichis, S.T. Acton and S. Murillo, "Video tracking of retinal photoreceptor fields using adaptive optics," *Proc. Association for Research in Vision and Ophthalmology*, Ft. Lauderdale, Florida, April 27-May 1, 2008.

S.T. Acton, "Tracking and detection of rolling leukocytes in vivo," *NSF Workshop on Bio-image Informatics*, Santa Barbara, California, 2008.

J.J. Rychak, B. Li, S.T. Acton, A. Leppanen, R.D. Cummings, K. Ley and A.L. Klibanov, "Targeted ultrasound contrast agent retention under flow conditions," *Proc. Annual Meeting of the Society for Molecular Imaging*, Waikoloa, HI, August 30 - September 2, 2006.

S. Millington, B. Li, S. Trattnig and S.T. Acton, "Topography of talar articular cartilage determined by high resolution MRI and semi-automated image segmentation," *Proc. International Cartilage Repair Society Meeting*, San Diego, CA, January 6-11, 2006.

A.L. Klibanov, J.J. Rychak, W.C. Yang, B. Li, S.T. Acton, J.R. Lindner, K.F. Ley and S. Kaul, "Targeted ultrasound contrast agents for molecular imaging in high-shear flow," *Contrast Media Research 2005*, Evian, France, October 11-16, 2005.

G. Dong, S.T. Acton, E. Damiano, "Detecting microspheres in venules for automated particle image velocimetry via a marked point process," *2005 Summer Bioengineering Conference*, Vail, CO, June 22-26, 2005.

J.J. Rychak, A.L. Klibanov, W. Yang, B. Li, S. Acton, A. Leppanen, R.D. Cummings, K. Ley, "Enhanced Microbubble Adhesion to P-selectin with a Physiologically-tuned Targeting Ligand," *10<sup>th</sup> Ultrasound Contrast Symposium*, San Diego, California, March 4-5, 2005 (Winner: Best Presentation Award).

- R.L. Janiczek, N. Ray, B. French, F. Epstein and S.T. Acton, "Automated calculation of myocardial mass and infarct size in mice using a Monte Carlo Markov chain active contour," *Society for Cardiovascular Magnetic Resonance*, San Francisco, California, January 21-23, 2005
- S.A. Millington, J. Tang, S.R. Hurwitz, S.T. Acton and J.R. Crandall, "Quantitative measurement of ankle cartilage using an isotropic MRI sequence and a directional gradient vector flow snake," *9<sup>th</sup> World Congress of the OsteoArthritis Society*, Chicago, Illinois, December 2-5, 2004.
- J.J. Rychak, B. Li, S.T. Acton, A. Leppanen, R.D. Cummings and K. Ley, "Enhanced adhesion of ultrasound contrast agents targeted to p-selectin using a physiological ligand," *Proc. of the Biomedical Engineering Society Annual Meeting*, Philadelphia, Pennsylvania, October 13-16, 2004.
- Y. Yu, J. Molloy and S.T. Acton, "Automated segmentation of the prostate from ultrasound imagery using the instantaneous coefficient of variation," *Proc. American Association of Physicists in Medicine*, San Diego, California, August 10-14, 2003.
- B. Cooley, S.T. Acton, M. Salerno, J.R. Brookeman, N. Tustison, E. E. de Lange, and T. Altes, "Automated Scoring of Hyperpolarized Helium-3 MR Lung Ventilation Images: Initial Development and Validation," *Proc. Intl. Soc. Mag. Reson. Med.*, Honolulu, Hawaii, May 18-25, 2002.
- G. Usanmaz, S.T. Acton, and M. M. Crawford, "Multiresolution supervised nonparametric algorithm for feature extraction and classification in multispectral imagery," *Proc. of the SPIE Conference on Remote Sensing*, Rome, Italy, Sept. 1994.
- S.T. Acton and A.C. Bovik, "Local and piecewise classes of nonlinear regression for image enhancement," *IEEE Signal Proc. Soc. Workshop on Multidimensional Signal Processing*, Cannes, France, September 8-10, 1993.

## ***Research Grants and Contracts***

**Title:** Sequential Monte Carlo Method for Real-time Tracking of Multiple Targets

**Source:** Army Research Office

**Title:** SEI: Hierarchical Dependency Graphs for Col-Space Design with Application to Leukocyte Detection and Tracking

**Source:** NSF

**Title:** Automated hemodynamic analysis in microvessels using  $\mu$ -particle image velocimetry

**Source:** NIH

**Title:** Changes in Cartilage Thickness in the Ankle Following Compressive Loads that Exceed the Deformation Threshold of the Joint Surface But Do Not Fracture the Subchondral Bone

**Source:** Zimmer, Inc.

**Title:** Real-time Hardware for Enhancement and Segmentation of Ultrasonic Imagery of the Prostate

**Source:** Mellon Prostrate Cancer Research Institute

**Title:** MRI of myocardial function in post-infarct knockout mice

**Source:** NIH

**Title:** High Resolution Anatomic and Elastographic Transrectal Ultrasound for Improved Diagnosis of Prostate Cancer

**Source:** U.S. Army Medical Research and Materiel Command

**Title:** Quantitative 3D Ultrasound Imaging of The Murine Heart

**Source:** NIH

**Title:** System for Automated Tracking of Leukocytes *In Vivo* (R33 Mechanism)

**Source:** NIH

**Title:** System for Automated Tracking of Leukocytes *In Vivo* (R21 Mechanism)

**Source:** NIH

**Title:** Decentralized Image Retrieval for Education

**Source:** NSF

**Title:** Advanced Biomedical Image Processing for Tracking Leukocytes *In Vivo* from Video Microscopy

**Source:** Whitaker Foundation (Biomedical Engineering Research Award)

**Title:** Clutter-reducing, Scalable Image Processing Methods for Target Acquisition and Tracking

**Source:** U.S. Army Research Office

**Title:** Advanced Image Processing for Image2000 Enhancements

**Source:** NASA

**Title:** Rapid deployment of drug discovery automation using machine vision

**Source:** Carilion Biomedical Institute

**Title:** Multi-Resolution Segmentation via Fusion of Mesonet Data and Remotely Sensed Imagery (Years 4 and 5)

**Source:** NASA (subcontract to U.Va. from OU)

**Title:** Multiresolution Sensor Fusion Using Morphological Pyramids

**Source:** NSF

**Title:** Multiresolution, Multi-Scale Target Identification and Tracking Using the Anisotropic Diffusion Pyramid

**Source:** U.S. Army Research Office (**Young Investigator Award**)

**Title:** Processing Digital Images Obtained From Indium Antimonide Sensors

**Source:** NSF

**Title:** Multi-Resolution Segmentation via Fusion of Mesonet Data and Remotely Sensed Imagery

**Source:** NASA

**Title:** Fusion of Infrared and X-ray Imagery for Automated Circuit Inspection

**Source:** Lucent Technologies

**Title:** Vision-based Circuit Board Inspection System

**Source:** Lucent Technologies

**Title:** Fusion of Infrared and X-ray Imagery for Automated Circuit Inspection (Feasibility Study)

**Source:** Lucent Technologies

**Title:** Automated Video Tracking and Inspection (additional time and funds)

**Source:** SVS, Inc., Albuquerque NM

**Title:** Image Processing for Agricultural Remote Sensing

**Source:** Site-Specific Technology Development Group, Stillwater OK

**Title:** Automated Video Tracking and Inspection

**Source:** SVS, Inc., Albuquerque NM

**Graduate Students Directed****Ph.D. Students and Dissertation Title****Graduation Date**

Wei Chen	Summer, 1997
"Morphological Image Pyramids for Automatic Target Recognition" (Currently: Senior Research Scientist with KLA Tencor)	
Joseph Bosworth	Spring, 2002
"Morphological Local Monotonicity for Multiscale Image Segmentation" (Currently: Research Engineer with Universal Imaging)	
Yongjian Yu	Spring, 2003
"Ultrasound Image Enhancement for Detection of Contours Using Speckle Reducing Anisotropic Diffusion" (Currently: Research Engineer with Utopia Compression)	
Nilanjan Ray	Spring, 2003
"Tracking Rolling Leukocytes In Vivo Using Active Contours with Motion Gradient Vector Flow" (Currently: Assistant Professor at University of Alberta)	
Dong Gang	Fall, 2005
"Detection of Rolling Leukocytes from Intravital Microscopy Images" (Currently: Postdoctoral Research Associate at U. Mass.)	
Jing Cui (co-advised w/ Z. Lin)	Spring, 2006
"In Vivo Multi-leukocyte Tracking by Enhanced Particle Filter"	
Michael Grant	Summer, 2006
"Surface Reflected Global Positioning System Signals for Terrain Classification" (Currently: Senior Research Engineer w/ NASA Langley Research Center)	
Bing Li	Summer, 2007 (expected)
Topic: Biomedical multi-target image tracking	
Drew Gilliam	Fall, 2007 (expected)
Topic: Biomedical image segmentation and tracking	
Robert Janiczek	Spring, 2008 (expected)
Topic: Cardiac MR Image Analysis	
Alla Aksel	Spring, 2008 (expected)
Topic: Cardiac Image Analysis	

**M.S. Students and Thesis Title****Graduation Date**

Auapong Yaicharoen	Summer, 1995
"The Anisotropic Diffusion Coefficient" (Currently: Assistant Professor, KMUTT, Thailand)	
Melynda Reed	Summer, 1995
"B-Spline Representations for Moire Fringes" (Currently: with Williams Communications)	
Timothy Jackson	Spring, 1996
"Automated Video Tracking and Inspection of Power Transmission Components" (Currently: Captain, U.S. Air Force, Kirtland AFB)	
Darren Tepe	Spring, 1996
"Infrared Inspection Techniques"	

- (Currently: Senior Engineer with the Federal Aviation Administration)
- Jerome Landis Spring, 1996  
 "A Multispectral Algorithm for Anisotropic Diffusion"  
 (Currently: with Seagate, Inc.)
- Mark Taiclet Fall, 1996  
 "Spatially Adaptive Anisotropic Diffusion"  
 (Currently: with U.S. Sprint telecommunications)
- C. Andrew Segall Fall, 1997  
 "Construction of the Scale Aware Anisotropic Diffusion Pyramid with  
 Application to Multi-scale Tracking"  
 (Currently: Leading image processing start-up in San Jose)
- Kelsey Pope Summer, 1997  
 "Modified Gradient Mean Curvature Motion and Vector Distance Dissimilarity  
 for Multispectral Anisotropic Diffusion"  
 (Currently: with Seagate, Inc.)
- Takashi Koshimizu Summer, 1998  
 "Watershed merging with application to remote sensing"  
 (Currently: engineering manager for Bayer, Inc., Japan)
- Anthony Wright Fall, 1998  
 "Multiresolution Watershed Segmentation"  
 (Currently: Director of Network Planning at Solinet, Inc.)
- Matthew Burton Spring, 1999  
 "Sliding Mode Control Study for Application to Disk Drive Servo Systems"  
 (Currently: with Rational Corp.)
- David Cary Summer, 1999  
 "Differential Average Equal-Size Image Compression"  
 (Currently: working on GPS systems with Brunswick)
- Zhongxiu Hu Fall, 1999  
 "Morphological Pyramid Image Registration"  
 (Currently: with Motorola, Inc.)
- Badrinarayan Ragunathan Summer, 2000  
 "Image Segmentation and Content-based Retrieval"  
**Winner, Graduate Research Award (Best Thesis), 2000**  
 (Currently: with Bosch Corporation.)
- Junaid Ahmed Summer, 2000  
 "Image Segmentation for Object Based Image Compression"  
 (Currently: with Applied Science Fiction, Inc.)
- Kate Weber Spring, 2003  
 "On Connected Filters in Color Image Processing"  
 (Currently: with Night Vision Laboratories)
- Michael Welser Spring, 2003  
 "Projection Model Snakes for Tracking Using a Monte Carlo Approach"  
 (Currently: with Air Force Research Laboratories)
- Adam Goobic Spring, 2003  
 "Image Registration and Stabilization for Tracking Leukocytes in the  
 Microvasculature"

(Currently: with Air Force Research Laboratories)	
Sridhar Reddy	Fall, 2003
"Segmentation using classification and spatial constraints applied to image retrieval"	
(Currently: with image processing start-up in CA)	
Sean Jellish	Summer, 2004
"Real-Time Video Detection and Tracking of Rolling Leukocytes"	
(Currently: with Night Vision Laboratories)	
Robert Janiczek	Fall, 2005
"Automated Segmentation of Cardiac MRI"	
John Pickard	Spring, 2005
"Automated MCE Perfusion Analysis"	
Bing Li	Spring, 2005
"Multiassignment Interactive Multiple Model for Multiple Target Tracking"	
Kirill Orlov	Summer, 2007
Topic: Hyperspectral Imaging	
Marija Cvijetic	Summer, 2007
Topic: Cell Detection and Tracking	

### ***Undergraduate Theses***

Michael Welser	Spring, 2002
"Clutter Reducing Filters for Target Tracking"	
Adam Goobic	Spring, 2002
"A Comparison of Trackers for Rolling Leukocytes <i>In Vivo</i> "	
<b>Finalist, Undergraduate Research Symposium (Best Thesis)</b>	
Conor Sibley	Spring, 2002
"Content-based Image Retrieval"	
Alexander Kepler	Spring, 2002
"Gabor Filters in Texture Recognition and Matching, for Content-based Image Retrieval"	
Robert Janiczek	Spring, 2003
"Classification of Lung Ventilation in Hyperpolarized Helium-3 Magnetic Resonance Images"	
Aaron Domnitch	Spring, 2003
"An Image Compressor that Removes Psycho-Visual Redundancies"	
Avneet Kang	Spring, 2003
"Naturalness in Text-to-Speech Synthesis"	
Kevin Schaal	Spring, 2003
"A comparison of trackers on military targets"	
Stacey Opaska	Spring, 2003
"Developing a Directional Filtering Algorithm for Improving Image Compression"	
Mark Peverill	Spring, 2003
"Tracking actin filaments in vitro"	
John Hunter	Fall, 2003

"Motion tracking for T-cells"	
Xung Nham	Fall, 2003
"Compression of elevation data"	
Dorothy Wang	Spring, 2004
"Biometric identification using retinal scans"	
Marquita Henderson	Spring, 2005
"Cartilage volume computation for MR images"	
Kirill Orlov	Spring, 2005
"Robust Multiple Event Detection in Hyperspectral Infrared Video"	
Marija Cvijetic	Spring, 2006
"A Graphical User Interface for Leukocyte Detection and Tracking"	
Henry Abbot	Spring, 2007
"dvoc: An Open Source Real-time Vocoder"	
Ashley Elkin	Spring 2007
"RFID for Mobile Nurse Station"	

### ***Visitors and Postdoctoral Fellows***

Dr. Alfredo Restrepo, Summer 1998

Current position: Associate Professor, Universidad de los Andes, Bogota, Colombia

Dr. Dipti Prasad Mukherjee, 1999-2000, 2001-2002

Current position: Associate Professor, Indian Statistical Institute, Calcutta, India

Dr. Nilanjan Ray, Research Associate, 2003-2005

Current position: Assistant Professor, University of Alberta, Alberta, Canada

Dr. Jinshan Tang, Research Scientist, 2002-2005

Current position: Assistant Professor, Alcorn State University

Dr. Peter Tay, Research Associate, 2005-2006

Current position: Assistant Professor, Alcorn State University

### ***Service to the University, the School, and the Department***

- Chair, ECE Eminent Speaker Series, 2004-
- Chair, ECE Graduate Recruiting Committee, 2003-
- Member, ECE Faculty Recruiting Committee, 2004-
- Member, ECE Faculty Recognition Committee, 2003-
- Member, Dean's Research Advisory Council, SEAS, 2003-
- Member, Nominations and Elections Committee, SEAS, 2003-
- Chair, Teaching Effectiveness Committee, SEAS, 2004-2005
- Member, SEAS Faculty Fellows, 2003-2005
- Member, Teaching Effectiveness Committee, SEAS, 2002-2004
- Speaker, SEAS New Faculty Orientation, 2003
- Mentor, Faculty-Student Mentoring Program, Office of African-American Affairs, 2001-2002
- Member, ECE Chair Search Committee, 2003
- First Year Advising, SEAS, 2004-
- Chair, ECE Undergraduate Planning Committee, 2001-2002
- Exhibitor, SEAS Open House, 2001, 2002, 2003
- Exhibitor, ECE Open House, 2000, 2001, 2002
- Member, hiring committee for support staff, 2003, 2004
- Member, ECE Graduate Committee, 2002-2003
- Member, SEAS Teaching Evaluation Committee, 2002-2003
- Member, TCC 401/402 Committee, 2001-
- Member, ECE Undergraduate Committee, 2000-2002
- Member, ABET Planning Committee, 2000-2001
- Member, ECE Computer Resources Committee, 2000-2002
- Member, SEAS Student Affairs Committee, 2000-2001
- Member, Ad Hoc Committee on Teaching Loads, Spring 2001
- Chair, Graduate Programs Committee, OSU, 1998-2000
- Member, Hall of Fame Award Committee, OSU, 1998
- Member, ECEN Head Search Committee, OSU, 1997-1998
- Member, Faculty Search Committee, OSU, 1996-1997, 1998-1999, 1999-2000
- Member, Halliburton Awards Committee, OSU, 1998
- Member, Lohmann Medal Committee, OSU, 1997
- Member, ECEN Computer Committee, OSU, 1995-1997
- Member, ECEN Laboratory Development Committee, OSU, 1995-1997
- Member, Technical Advisory Committee, Center for Sensors and Sensor Technologies, OSU, 1997-2000
- Mentor, OKAMP-SEM (Oklahoma Alliance for Minority Participation in Science, Engineering and Mathematics), 1995-1997

### ***Membership in Professional Societies***

- Institute of Electrical and Electronics Engineers (IEEE), Senior Member
- Signal Processing Society of the IEEE

- Engineering in Medicine and Biology Society of the IEEE

## *Professional Service*

### **Editorial Work**

- Associate Editor, *IEEE Transactions on Image Processing*, 2007-
- Associate Editor, *IEEE Signal Processing Letters*, 2001-2004
- Associate Editor, *IEEE Transactions on Image Processing*, 1997-2003
- Guest Editor, Special Issue on Multimedia System Technologies for Educational Tools, *Multimedia Systems Journal*, 2005

### **Conference Organization and Leadership**

- Vice Technical Chair, 43<sup>nd</sup> Asilomar Conf. on Signals, Systems and Computers, 2009
- Finance Chair, IEEE Int. Symposium on Biomedical Imaging, 2009
- Technical Area Chair, 42<sup>nd</sup> Asilomar Conf. on Signals, Systems and Computers, 2008 (in charge of organizing six sessions in the Biomedical Signal & Image processing area)
- **Program Co-Chair**, 2008 IEEE SW Symposium on Image Understanding and Interpretation
- Special Sessions Chair, IEEE International Conf. on Image Processing, 2007
- **General Chair**, 40<sup>th</sup> Asilomar Conf. on Signals, Systems and Computers, 2006
- **Technical Program Chair**, 38<sup>th</sup> Asilomar Conf. on Signals, Systems and Computers, 2004
- Student Paper Contest Chair, 37<sup>th</sup> Asilomar Conf. on Signals, Systems and Computers, 2003
- Track Chair, 45<sup>th</sup> Midwest Symposium on Circuits and Systems, 2002 (in charge of organizing five sessions in the image processing area)
- Technical Area Chair, 35<sup>th</sup> Asilomar Conf. on Signals, Systems and Computers, 2001 (in charge of organizing nine sessions in the signal & image processing area)
- Technical Area Chair, 34<sup>th</sup> Asilomar Conf. on Signals, Systems and Computers, 2000 (in charge of organizing eight sessions in the signal & image processing area)
- **Program Co-Chair**, 1996 IEEE Southwest SW on Image Understanding and Interpretation

### **Conference Committees**

- Member of Review Board, Medical Image Computing and Computer-Assisted Intervention, 2007
- Member of Review Board, IEEE International Symposium on Biomedical Imaging, 2007
- Member of Program Committee, International Conference on Advances in Pattern Recognition, 2007
- Member of Technical Program Committee, Workshop on Microscopic Image Analysis with Applications in Biology, 2006
- Member of Technical Program Committee, Workshop on Orthopedic Image Analysis with Applications in Biology, 2006
- Member of Technical Program Committee, IEEE SW Symposium on Image Understanding and Interpretation, 2006
- Member of Review Board, IEEE International Symposium on Biomedical Imaging, 2006
- Member of Review Board, IEEE International Conference on Acoustics, Speech and Signal Processing, 2006
- Member of Technical Program Committee, IEEE International Conf. on Image Processing, 2005
- Member of Technical Program Committee, IEEE International Conf. on Image Processing, 2004
- Member of Program Committee, SIAM Imaging Science, 2004
- Member of Program Committee, Conf. on Computer Vision, Graphics and Image Processing, 2004
- Member, Technical Program Committee, IEEE SW Symposium on Image Understanding and Interpretation, 2004
- Member of Technical Program Committee, IEEE International Conf. on Image Processing, 2003
- Member of Advisory Committee, ICAPR, 2003
- Member, Technical Program Committee, IEEE SW Symposium on Image Understanding and Interpretation, 2002
- Member of Technical Program Committee, IEEE International Conf. on Image Processing, 2002
- Member of Technical Program Committee, IEEE International Conf. on Image Processing, 2001
- Member, ACIVS 2001 Program Committee
- Member, Referee Board, International Conference on Pattern Recognition, 2000
- Member, Technical Program Committee, IEEE SW Symposium on Image Understanding and Interpretation, 2000
- Member of Review Board, IEEE International Conf. on Image Processing, 1999
- Member of the Advisory Committee, International Conference on Advances

- in Pattern Recognition and Digital Techniques, ICAPRDT '99
- Member of Technical Program Committee, IEEE International Conf. on Image Processing, 1998
- Member, Technical Program Committee, IEEE SW Symposium on Image Understanding and Interpretation, 1998
- Member of Technical Program Committee, IEEE International Conf. on Image Processing, 1997
- Member, Organizing Committee, IEEE SW Symposium on Image Understanding and Interpretation, 1995-1998
- Member of Technical Program Committee, IEEE International Conf. on Image Processing, 1994

### **Conference Session Chair**

- Session Chair, IEEE Int. Symposium on Biomedical Imaging, 2007
- Session Chair, IEEE International Conf. on Image Processing, 2006
- Session Chair, IEEE Southwest Symposium on Image Understanding and Interpretation, 2006.
- Session Chair, IEEE International Conf. on Image Processing, 2005
- Session Chair, Asilomar Conference on Signals, Systems and Computers, 2005
- Session Chair, Computer Based Medical Systems, NIH, 2004
- Session Chair, IEEE Southwest Symposium on Image Understanding and Interpretation, 2004.
- Session Chair, IEEE International Conf. on Image Processing, 2003
- Session Chair, IEEE International Conf. on Image Processing, 2002
- Session Chair, IEEE Southwest Symposium on Image Understanding and Interpretation, 2002.
- Session Chair, IEEE International Conf. on Image Processing, 2001
- Session Chair, IEEE International Conf. on Image Processing, 2000
- Session Chair, IEEE International Conf. on Acoustics, Speech and Signal Processing, 2000
- Session Chair, IEEE International Conf. on Image Processing, 1999
- Session Chair, International Conference on Advances in Pattern Recognition and Digital Techniques, ICAPRDT '99, Calcutta, India
- Session Chair, IEEE International Conf. on Acoustics, Speech and Signal Processing, 1999
- Session Chair, IEEE International Conf. on Image Processing, 1998
- Session Chair, IEEE International Conf. on Image Processing, 1994

### ***Reviewing***

#### **Reviewer for:**

*IEEE Transactions on Medical Imaging, 2002-  
IEEE Transactions on Biomedical Engineering, 2003-*

*IEEE Transactions on Image Processing*, 1994-  
*IEEE Transactions on Signal Processing*, 1996-  
*IEEE Transactions on Pattern Analysis and Machine Intelligence*, 1997-  
*IEEE Transactions on Circuits and Systems, Part II*, 1998-2000  
*Proceedings of the IEEE*, 1998-  
*Journal of Visual Communication and Image Representation*, 1996-1999  
*Graphical Models and Image Processing*, 1995-2000  
*Vision, Image and Signal Processing*, 1995-1999  
*Pattern Recognition and Pattern Recognition Letters*, 1994 -  
*Digital Signal Processing*, 1994-2002  
*International Journal of Remote Sensing and Remote Sensing Letters*, 1997-  
2003  
*Encyclopedia of Electrical Engineering*, 1997-1998  
*International Symposium on Circuits and Systems*, 1998  
*IEEE International Conf. on Acoustics, Speech and Signal Processing*, 2000-  
*IEEE Signal Processing Letters*, 1999-  
*Applied Mathematics Letters*, 1999-2000  
*IEEE Control Systems Magazine*, 1999  
*Journal of Electronic Imaging*, 1999-  
McGraw Hill Textbooks, 1999  
Prentice Hall Textbooks, 2002, 2004  
*Neural Networks*, 2000

### **Proposal Review**

- Member (ad hoc), NIH Study Section
  - Microscopic Imaging, 2004-
  - Immunology, 2005-
  - Bioengineering Research Partnerships, 2006-
- Panelist, NSF SBIR Review, 2006
- Proposal Reviewer, Michigan Technology Corridor, 2004-
- Proposal Reviewer, Nebraska EPSCoR competition, 2005
- Proposal Reviewer, Tennessee DEPSCoR competition, 2005, 2006
- Panelist NSF NSDL (National Science Digital Library), 2002
- Panelist, NSF CCLI Review, 2000
- Proposal Reviewer, Netherlands Organization for Scientific Research, 2002
- Proposal Reviewer, U.S. Civilian Research and Development Foundation (CRDF), 2001
- Technical Proposal Evaluator for the Army Research Office, 1996-
- Technical Proposal Evaluator for the NSF-CISE, 1997-