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EXPERIENCE

Chair, Electrical & Computer Engineering, UVA, 2022-
AI Advisor to the Provost, UVA, 2024-2025
AT&T Professor of Engineering, UVA, 2025-
Lawrence R. Quarles Professor of Engineering and Applied Science, UVA, 2023-2025
Acting Deputy Division Director, Directorate for Computer and Information Science and Engineering, National Science Foundation, 2021-2022
Program Director, Directorate for Computer and Information Science and Engineering, National Science Foundation, 2019-2021
Professor, University of Virginia, 2005-
Editor-in-Chief, *IEEE Transactions on Image Processing*, 2014-2018
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 Engineer, 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^3I Intern, The MITRE Corp., McLean, VA, 1985 - 1987
Programmer, AT&T Corp., Oakton, VA, 1982 – 1984

EDUCATION

PhD	University of Texas at Austin, Electrical & Computer Engineering	Dec. 1993
MS	University of Texas at Austin, Electrical & Computer Engineering	May 1990
BS	Virginia Tech, Electrical Engineering	May 1988

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HONORS AND AWARDS

- **Fellow, IEEE**. For "contributions to biomedical image analysis," 2013
- **Fellow, AIMBE** (American Institute for Medical and Biological Engineering), 2025
- **American Telephone and Telegraph Company Chair**, 2025-
- Member, Virginia Tech ECE Advisory Board, 2025-
- IEEE Distinguished Lecturer, 2025-2027
- UVA Outstanding Researcher, 2024
- Fellow, Asia-Pacific Artificial Intelligence Association, 2024
- Fellow, Artificial Intelligence Industry Alliance, 2024
- Induction into Heta Lambda Beta Society, Virginia Tech, 2024
- External Advisory Board, George Washington University, 2024-
- **Lawrence R. Quarles Professor of Engineering and Applied Science**, 2023-2025
- **Director's Award for Superior Accomplishment**, National Science Foundation, 2021
- Best paper recognition (top 10% of accepted papers), IEEE International Conference on Image Processing, 2019 (with J. Wang, T. Batabyal, A. Gahlmann)
- Educational Innovation Award, 2017
- Best paper recognition (top 10% of accepted papers), IEEE International Conference on Image Processing, 2015 (with T. Batabyal & A. Vaccari)
- Best Oral Presentation (with Ed Hoppe), Transport Research Arena, 2014
- Finalist, Thomas E. Hutchinson Award, 2013 for "contributions to the students of the Engineering School"
- External Advisory Board, Carnegie Mellon University, 2013-2016, 2018-2021
- Best Paper Award, 2011 IEEE International Symposium on Biomedical Imaging (with U.Va. student Saurav Basu and Dr. Barry Condron)
- Finalist, State Council of Higher Education Outstanding Faculty Award, 2010
- **All University Teaching Award**, University of Virginia, 2009
- Visiting Professor, University of New Mexico, 2007-2008
- Selected for UVA's Unforgettable Lectures, 2007, 2009
- 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
- Senior Member, IEEE, 1999
- Big 12 Faculty Fellowship, 1998
- 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
REFEREED JOURNALS

M. Korban, P. Youngs and S.T. Acton, "A Dynamic Fractional Generalized Deterministic Annealing for Rapid Convergence in Deep Learning Optimization," *Nature (npj) Artificial Intelligence*, accepted for publication, 2025.

M. Korban, P. Youngs and S.T. Acton, "A dynamic predictive transformer with temporal relevance regression for action detection," *Pattern Recognition*, vol. 166, 111644, 2025.

M. Korban, P. Youngs and S.T. Acton, "A semantic and motion-aware spatiotemporal transformer network for action detection," *IEEE Transactions on Pattern Analysis and Machine Intelligence*, vol. 46, pp. 6055-6069, 2024.

J.K. Foster, P. Youngs, R. van Aswegan, S. Singh, G.S. Watson and S.T. Acton, "Automated classification of elementary instructional activities: analyzing the consistency of human annotations," *Journal of Learning Analytics*, vol. 3, pp. 142-159, 2024.

T. Toma, Y. Yang, A. Gahlmann and S.T. Acton, "Deep temporal sequence classification and mathematical modeling for cell tracking in dense 3D microscopy videos of bacterial biofilms," arXiv: 2406.19574, 2024.

T. Toma, Y. Yang, A. Gahlmann and S.T. Acton, "DeepSeeded: volumetric segmentation of dense cell populations with a cascade of deep neural networks in bacterial biofilm applications," *Expert Systems with Applications*, vol. 238, 1222084, 2024.

A. Glandon, L. Vidyaratne, N. Dhar, B. Familoni, N. Sadeghzadehyazdi, S.T. Acton and K. Iftekharrudin, "3D far-field Lidar sensing and computational modeling for human identification," *Applied Optics*, vol. 63, pp. 15-23, 2024.

J.K. Foster, M. Korban, P. Youngs, G.S. Watson and S.T. Acton, "Automatic classification of activities in classroom videos," *Computers and Education: Artificial Intelligence*, vol. 6, pp. 1-13, 100207, 2024.

M. Korban, P. Youngs and S.T. Acton, "A multi-modal transformer for action detection," *Pattern Recognition*, 109713, 2023.

M. Korban, P. Youngs and S.T. Acton, "TAA-GCN: A temporally aware adaptive graph convolutional network for age estimation," *Pattern Recognition*, 109066, 2023.

M.S. Pattichis, S.T. Acton, C.S. Pattichis and A.S. Panayides, "Large-scale medical image and video analytics for clinical decision support," *IEEE Journal of Biomedical and Health Informatics*, vol. 27, pp. 2-6, 2023.

J. Zhang, Y. Wang, E.D. Donarski, T.T. Toma, M.T. Miles, S.T. Acton and A. Gahlmann, "BCM3D 2.0: Accurate segmentation of single bacterial cells in dense biofilms using computationally generated intermediate image representations," *Biofilms and Microbiomes*, vol. 8, pp. 1-13, 2022.

J. Wang, N. Tabassum, T.T. Toma, Y. Wang, A. Gahlmann and S.T. Acton, "3D GAN image synthesis and dataset quality assessment for bacterial biofilm," *Bioinformatics*, vol. 38, pp. 4598-4604, 2022.

T. Batabyal, D. Weller, J. Kapur and S.T. Acton, "Efficient learning of transform-domain LMS filter using graph Laplacian," *IEEE Transactions on Neural Networks and Learning Systems*, February 2022.

H. Ma, S.T. Acton and Z. Lin, "CAT: centerness-aware anchor-free tracker," *Sensors*, vol. 22, pp. 354-367, 2022.

N. Sadeghzadehyazdi, T. Batabyal, A. Glandon, N. Dhar, B. Familoni, K. Iftekharuddin and S.T. Acton, "Using skeleton correction to improve flash Lidar-based gait recognition," *Applied Artificial Intelligence*, vol. 16, pp. 1-33, 2022.

J. Wang, M. Zhang, J. Zhang, Y. Wang, A. Gahlmann and S.T. Acton, "Graph-theoretic post-processing of segmentation with application to dense biofilms," *IEEE Transactions on Image Processing*, vol. 20, pp. 8580-8594, 2021.

N. Sadeghzadehyazdi, T. Batabyal and S.T. Acton, "Modeling spatiotemporal patterns of gait anomaly with a CNN-LSTM deep neural network," *Expert Systems with Applications*, vol. 185, 115582, 2021.

J. Zhang, Y. Wang, M. Zhang, A. Achimovich, J. Wang, S.T. Acton and A. Gahlmann, "High-resolution imaging of single-cell behaviors in 3D bacterial biofilms using lattice-light sheet microscopy and deep learning-based image processing," *Microscopy and Microanalysis*, vol. 27, pp 3038-3040, 2021.

N. Tabassum, J. Wang, M. Ferguson, J. Herz, M. Dong, A. Louveau, J. Kipnis and S.T. Acton, "Image segmentation for neuroscience: lymphatics," *J. Physics: Photonics*, vol. 3, 035004, 2021.

T. Ly, J. Wang, K. Bisht, U. Eyo and S.T. Acton, "C3VFC: A method for tracing and quantification of microglia in 3D temporal images," *Applied Sciences* (Special issue on Medical Image Analysis: From Small Size Data to Big Data), vol. 11, p. 6078, 2021.

L. Liu, K.N. Kearns, I. Eli, K.A. Sharifi, S. Soldozy, E.W. Carlson, K.W. Scott, M.F. Sluzewski,

S.T. Acton, K. Stauderman, M. Kalani, M. Park and P. Tvrdik, "Microglial calcium waves during the hyperacute phase of ischemic stroke," *Stroke*, vol. 52, 274-283, 2021.

M. Zhang, J. Zhang, Y. Wang, J. Wang, A. Achimovich, S.T. Acton and A. Gahlmann, "Non-invasive single-cell morphometry in living bacterial biofilms," *Nature Comm*., vol. 11, pp. 1-13, 2020.

S. Govinahallisathyanarayana, S.T. Acton and J.A. Hossack, "Closed loop low rank echocardiographic artifact removal," *IEEE Transactions on Ultrasonics, Ferroelectrics, and Frequency Control*, vol. 68, pp. 510-525, 2020.

A. Dutta, T. Batabyal, M. Basu, and S.T. Acton, "An efficient convolutional neural network for coronary heart disease prediction," *Expert Systems with Application*, vol. 159, 113408, 2020.

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T. Batabyal, B. Condron, S.T. Acton, "NeuroPath2Path: Classification and elastic morphing between neuronal arbors using path-wise similarity," *Neuroinformatics*, vol. 18, pp. 479-508, 2020.

H. Ma, Z. Lin and S.T. Acton, "FAST: Fast and accurate scale estimation for tracking," *IEEE Signal Processing Letters*, vol. 27, pp. 161-165, 2019.

M. Dombrovski, A. Kim, L. Poussard, A. Vaccari, S.T. Acton, E. Spillman, B. Condron and Q. Yuan, "A plastic visual pathway regulates cooperative behavior in Drosophila larvae," *Current Biology*, vol. 29, pp. 1866-1876, 2019.

H. Jeelani, H. Liang, S.T. Acton and D.S. Weller, "Content-aware enhancement of images with filamentous structures," *IEEE Transactions on Image Processing*, vol. 28, pp. 3451-3461, 2019.

S. Da Mesquita, A. Louveau, A. Vaccari, I. Smirnov, R.C. Cornelison, K.M. Kingsmore, C. Contarino, S. Onengut-Gumuscu, E. Farber, D. Raper, K.E. Viar, W. Baker, N. Dabhi, S. Rich, J.M. Munson, C.C. Overall, S.T. Acton and J. Kipnis, "Meningeal lymphatics affect brain perfusion and underlie age-dependent cognitive decline and Alzheimer's pathology," *Nature*, vol. 560, pp. 185-191, 2018.

J.L. Vilas, N. Tabassum, J. Mota, D. Maluenda, A. Jimenez-Moreno, T. Majtner, J.M. Carazo, S.T. Acton and C.O.S. Sorzano, "Advances in image processing for single particle analysis by electron cryomicroscopy and challenges ahead," *Current Opinion in Structural Biology*, vol. 52, pp. 127-145, 2018.

A. Vaccari, T. Batabyal, N. Tabassum, E. Hoppe, B. Bruckno and S.T. Acton, "Integrating remote sensing data in decision support systems for transportation asset management," *Transportation Research Record*, 0361198118786645, 2018.

K.M. Kingsmore, A. Vaccari, D. Abler, S.X. Cui, F.H. Epstein, R.C. Rockne, S.T. Acton, J.M. Munson, “MRI analysis to map interstitial flow in the brain tumor microenvironment,” *APL Bioengineering*, vol. 2(3), 031905, 2018.

J.C. Cronk, A.J. Filiano, A. Louveau, I. Marin, R. March, E. Ji, D. Goldman, I. Smirnov, N. Geraci1, S.T. Acton, C.C. Overall and J. Kipnis, "Peripherally-derived macrophages can engraft the brain independent of irradiation and maintain an identity distinct from microglia," *Journal of Experimental Medicine*, vol. 215, pp. 1627-1647, 2018.

S.T. Acton, “Farewell editorial,” *IEEE Transactions on Image Processing*,” vol. 27, pp. 8-9, 2018.

R. Sarkar and S.T. Acton, “SDL: Saliency-based dictionary learning framework for image similarity,” *IEEE Transactions on Image Processing*,” vol. 27, pp. 749-763, 2018.

A. Paul, D.P. Mukherjee and S.T. Acton, "Speckle removal using diffusion potential for optical coherence tomography images," *IEEE Journal of Biomedical Informatics*, DOI: 10.1109/JBHI.2018.2791624, 2018.

N. Tabassum, A. Vaccari and S.T. Acton, “Speckle removal and change preservation by distance-driven anisotropic diffusion of synthetic aperture radar temporal stacks,” *Digital Signal Processing*, vol. 74, pp. 43-55, 2018.

M. Dombrovski, L. Poussard, K. Moalem, L. Kmecova, N. Hogan, E. Schott, A. Vaccari, S.T. Acton and B. Condron, “Cooperative behavior emerges among Drosophila larvae,” *Current Biology*, vol. 27, pp. 2821-2826, 2017.

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C. Kervann, S.T. Acton, J.-C. Olivo-Marin, C.O.S. Sorzano and M. Unser, “Introduction to the issue on advanced signal processing in microscopy and cell imaging,” *IEEE Journal of Selected Topics in Signal Processing*, vol. 10, pp. 3-5, 2016.

N. Ray, S. McArdle, K. Ley and S.T. Acton, “MISTICA: Minimum Spanning Tree-based Coarse Image Alignment for Microscopy Image Sequences,” *IEEE Journal of Biomedical and Health Informatics*, vol. 20, pp. 1575-1584, 2016.

Z. Slepian, K. Sundby, S. Glier, J. McDaniels, T. Nystrom, S. Mukherjee, S.T. Acton and B. Condron, “Visual attraction in Drosophila larvae develops during a critical period and is modulated by crowding conditions,” *Journal of Comparative Physiology A*, vol. 201, pp. 1019–1027, 2015.

R. Sarkar, S. Mukherjee and S.T. Acton, "Dictionary learning level set," *IEEE Signal Processing Letters*, vol. 22, pp. 2034-2038, 2015.

E.J. Hoppe, Y. Kweon, B.S. Bruckno, S.T. Acton, L. Bolton, A. Becker, A. Vaccari, "Historical Analysis of Tunnel Approach Displacements Using Satellite Remote Sensing," *Transportation Research Record*, vol. 2510, pp. 15-23, 2015.

S. Mukherjee, B. Condron and S.T. Acton, "Tubularity flow field – a technique for automatic neuron segmentation," *IEEE Transactions on Image Processing*, vol. 24, pp. 374-389, 2015.

S. Basu, J. Poulin and S.T. Acton, "Manifolds for pose tracking from monocular video," *SPIE Journal of Electronic Imaging*, vol. 24(2), 023014-1-21, 2015.

S. Mukherjee and S.T. Acton, "Region based segmentation in presence of intensity inhomogeneity using Legendre polynomials," *IEEE Signal Processing Letters*, vol. 22, pp. 298-302, 2015.

Q. Sang, Z. Lin and S.T. Acton, "A grid-based tracker for erratic targets," *Pattern Recognition*, vol. 48, pp. 3527–3541, 2015.

L. Dengel, J. Judge, S.T. Acton and C. Slingluff, Jr., "Total body photography for skin cancer screening," *International Journal of Dermatology*, vol. 54, pp. 1250-1254, 2015.

A. Vaccari, M. Stuecheli, E. Hoppe, B.S. Bruckno and S.T. Acton, "Detection of geophysical features in InSAR point cloud data sets using spatiotemporal models," *International Journal of Remote Sensing*, vol. 34, pp. 8215-8234, 2013.

S. Basu, B. Condron, A. Aksel, S.T. Acton, "Segmentation and Tracing of Single Neurons from 3D Confocal Microscope Images," *IEEE Journal of Biomedical and Health Informatics*, vol. 17, pp. 319-335 2013.

A.L. Shada, L.T. Dengel, G.R. Petroni, M.E. Smolkin, S.T. Acton and C.L. Slingluff, Jr., "Infrared thermography of cutaneous melanoma metastases," *Journal of Surgical Research*, vol. 182, pp. 9-13, 2013.

E.K. Koltsova, Z. Garcia, G. Chodaczek, M. Landau, S. McArdle, S. Scott, S. Von Vietinghoff, E. Galkina, Y. Miller, S.T. Acton and K. Ley, "Dynamic T cell–APC interactions sustain chronic inflammation in atherosclerosis," *Journal of Clinical Investigation*, vol. 122, pp. 3114-26, 2012.

G.T. Bass, K. Ryall, A. Katikapalli, B.E. Taylor, S.T. Dang, S.T. Acton and J.J. Saucerman, "Automated image analysis identifies signaling pathways regulating distinct signatures of cardiac myocyte hypertrophy," *Journal of Molecular and Cellular Cardiology*, vol. 50, pp. 923-930, 2012.

X. Liu, Z. Lin and S.T. Acton, "A grid-based Bayesian approach to robust visual tracking," *Digital Signal Processing*, vol. 22, pp. 54-65, 2012.

R.L. Janiczek, C.H. Meyer, S.T. Acton, B.R. Blackman and F.H. Epstein, "Three-dimensional phase contrast angiography of the mouse aortic arch using spiral MRI," *Magnetic Resonance in Medicine*, vol. 66, pp. 1382-1390, 2011.

P. Tay, S.T. Acton, and J.A. Hossack, "A wavelet thresholding method to reduce ultrasound artifacts," *Computerized Medical Imaging and Graphics*, vol. 35, pp. 42-50, 2011.

K.R. Prasad, Y. Xu, Z. Yang, S.T. Acton and B.A. French, "Robust cardiomyocyte-specific gene expression following systemic injection of AAV: in vivo gene delivery follows a Poisson distribution," *Gene Therapy*, vol. 18, pp. 43-52, 2011.

P. Tay, C.D. Garson, S.T. Acton and J.A. Hossack, "Ultrasound despeckling for contrast enhancement," *IEEE Transactions on Image Processing*, vol. 19, pp. 1847-1860, 2010.

M.A. Goodrum, M. Trotter, A. Aksel and S.T. Acton and K. Skadron, "Parallelization of particle filter algorithms," *Computer Architecture*, vol. 19, pp. 139-149, 2010. Reprinted in *Computer Architecture*, *Lecture Notes in Computer Science,* vol. 6161, pp. 139-149, 2012.

P. Tay, J.P. Havlicek, S.T. Acton, and J.A. Hossack, "Properties of the magnitude terms of orthogonal scaling functions," *Digital Signal Processing*, vol. 20, pp. 1330-1340, 2010.

E.L. McGarvey, M. Leon-Verdin, L. Baum, K. Bloomfield, D.R. Brenin, C. Koopman, S.T. Acton, B. Clark, E.B. Parker, Jr., "An Evaluation of a Computer Imaging Program to Prepare Women for Chemotherapy-related Alopecia," *PsychoOncology*, DOI 10.1002, 2010.

A.D. Gilliam, F.H. Epstein and S.T. Acton, "Cardiac motion recovery via active trajectory field models," *IEEE Transactions on Information Technology in Biomedicine*, vol. 13, pp. 226-235, 2009.

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*, vol. 55, pp. 139-156, 2009.

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," *Computerized Medical Imaging and Graphics*, vol. 32: 321-330, 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.

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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, #033013, 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.

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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, "Targeted ultrasound contrast agent for molecular imaging of inflammation in high-shear flow," *Contrast Media and Molecular Imaging*, vol. 1, pp. 259-266, 2006.

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J. Cui, S.T. Acton and Z. Lin, "A Monte Carlo approach to rolling leukocyte tracking in vivo," *Medical Image Analysis*, vol. 10, pp. 598-610, 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 G.W.M. Rauterberg, "Editorial: introduction to multimedia system technologies," *Multimedia Systems Journal*, vol. 11, pp. 201-202, 2006.

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S. Millington, J. Tang, S.T. Acton, S. Hurwitz and J. Crandall, “Quantitative MRI of ankle articular cartilage,” *J. Bone Joint Surg. Br.*, vol. 87, pg. 372, 2005.

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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.

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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.

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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.

INVITED PRESENTATIONS

"Multimodal AI for Advancing Instruction," IEEE-EURASIP Summer School on Signal Processing, San Vicenzo, Italy, September 26, 2025.

"From ChatGPT to a Semantic Transformer," IEEE-EURASIP Summer School on Signal Processing, San Vicenzo, Italy, September 25, 2025.

"The Future of Generative AI," Special Session at ICIP, Anchorage, Alaska, September 14, 2025.

"Artificial Intelligence for Biomedical Image Analysis," University of Minnesota, Minneapolis, Minnesota, June 4, 2025.

"Artificial Intelligence for Unraveling Mysteries of the Brain," Mayo Clinic, Rochester, Minnesota, June 2, 2025.

"Novel Data Science Applications in Education," Data Science and Education Workshop, School of Data Science, May 12, 2025.
"Image Analysis, Artificial Intelligence, and Life," University of Florida, Gainesville, Florida, March 6, 2025.
"A 40-Minute Short Course on AI," IEEE Distinguished Lecture, Fairleigh Dickinson University, February 12, 2025.
"AI," Thomas Hutchinson Lecture, UVA Rotunda, Charlottesville, Virginia, January 18, 2025.
"The AIAI Project," School of Education and Human Development, Charlottesville, Virginia, November 21, 2024.
"Pushing the Boundaries with Cutting-Edge AI Research Collaborations: University of Virginia vs. Virginia Tech," Disrupt Up, Roanoke, Virginia, November 15, 2024.
"AI in Education," University of Georgia, Athens, Georgia, October 25, 2024.
"The Wide World of Electrical and Computer Engineering with Scott Acton," Hoos in STEM podcast (hosted by Ken Ono), Spotify, October 18, 2024.
"Image, Videos and Artificial Intelligence," Distinguished Seminar, University of Michigan, April 5, 2024.
"A 45-Minute Short Course on Artificial Intelligence and Image Analysis," Invited Lecture, Purdue University, April 3, 2024.
"Visual Revolution: The Power of Images, Video, and Machine Learning," Spring 2024 Colloquium, Virginia Tech, March 27, 2024.
"AI Explained," ECE 1501 Frontiers in Electrical and Computer Engineering, University of Virginia, March 21, 2024.
"Artificial Intelligence in Image and Video Analysis," Baylor Engineering & Research Seminar, Baylor University, March 1, 2024.
"Visual Revolution: The Power of Images, Video, and Machine Learning," Henry R. and Gladys V. Irons Endowed Lectureship, Rutgers University, New Brunswick, New Jersey, November 15, 2023.
"Chat GPT: How does it work?" LSU, Baton Rouge, Louisiana, November 3, 2023.
"State of the Artificial," Keynote Address, UVA Research Retreat, Afton, Virginia. August 10, 2023.
"Bioimage Analysis, the Brain, and ChatGPT," University of Alabama Special Seminar, March 30, 2023.
"Microscopic image analysis for answering questions in smart health," Keynote Address, IEEE/ACM Conference on Connected Health Applications, Systems and Engineering Technologies, Washington, DC, November 17, 2022.
"Bioimage Analysis at Microscopic Scales," Invited Talk, Boston University, October 27, 2022.
"Bioimage Analysis at Microscopic Scales," NSF CISE-CCF Tech Talk, January 13, 2021.
"Statistics and Imaging Data," Keynote talk, *Recent Advances in Statistical Analysis of Imaging Data*, Tallahassee, Florida, December 5, 2020.
"Image analysis for neuroscience and relevant signal, image, and data processing at the NSF," Plenary Address, SPIE Optics and Photonics, San Diego, California, August 25, 2020.
"You, Image Analysis and the NSF," Invited Talk, IEEE SSIAI, Santa Fe, New Mexico, April 1, 2020.
"Signal Processing for Neuroscience," Invited Seminar, National Science Foundation, March 11, 2019.
"Research at VIVA," Invited Speaker, Siemens, February 13, 2019.

"Brain Pixels: image analysis for neuroscience," Keynote Address, IEEE SSIAI, Las Vegas, April 9, 2018.

"Research at VIVA," General Electric, May 1, 2018.

"An Engineer among Scientists: Research in image analysis for neuroscience," Department of Biochemistry and Molecular Genetics Colloquium, UVA, Charlottesville, Virginia, February 22, 2018.

"Reverse Engineering of Neurons," ECE Departmental Seminar, UVA, Charlottesville, Virginia, November 10, 2017.

"Neuroscience image analysis in progress," Brain, Immunology and Glia Research-in-progress, UVA, Charlottesville, Virginia, October 23, 2017.

"Virginia Image and Video Analysis," UVA Brain, Charlottesville, Virginia, September 28, 2017.

"Solving the mysteries of the brain, one pixel at a time," Keynote Address, International Symposium on Image Computing and Digital Medicine, Chengdu, China, September 23, 2017.

"Engineering and Biology Team Together to Reserve Engineer the Brain: An Image Analysis Perspective," Invited Talk, Tsinghua University, Beijing, China, September 21, 2017.

"State of the Transactions," IEEE ICIP, Beijing, China, September 20, 2017.

"Machine Learning and Image Processing: the Future," ICIG, Shanghai, China, September 15, 2017.

"Using Image Processing to Reverse Engineer the Brain," Plenary Talk, ICIG, Shanghai, China, September 14, 2017.

"Overview of the International Symposium on Biomedical Imaging," IEEE ISBI, Melbourne, Australia, April 21, 2017.

"State of the Transactions," IEEE ICASSP, New Orleans, Louisiana, March 6, 2017.

"Do Engineers have a Heart?" Keynote speech, Thomas E. Hutchinson Dinner, Rotunda, UVA, January 28, 2017.

"Best Practices for Associate Editors," IEEE SPS editorial meeting, Phoenix, October 27, 2016.

"Engineers help unravel mysteries of the brain," Distinguished Lecture, OSU, Stillwater, OK, October 11, 2016.

"Image analysis in the century of the brain," Invited Lecture, UESTC, Chengdu, China, March 24, 2016.

"Workshop on Radar for Transportation," TRB, Washington, D.C., January 8, 2016.

"An encyclopedia via media: Image analysis for the Neurome," IEEE ISM Distinguished Lecture, Miami, December 14, 2015.

"InSAR Remote Sensing for Performance Monitoring of Transportation Infrastructure at the Network Level," Commercial Remote Sensing & Spatial Information Technologies Workshop, Oklahoma City, December 3, 2015.

"Network level infrastructure inspection," Geotechnical Research Advisory Committee Meeting, Virginia Department of Transportation, October 16, 2015.

"How to be an effective Editor," IEEE ICIP, Quebec City, Quebec, September 30, 2015.

"How to be an effective Editor," IEEE SPS, Brisbane, Australia, April 22, 2015 (w/ Alessandro Foi).

"You've got a nerve to be doing your engineering on my biology," IEEE W. North Carolina section invited talk, April 10, 2015.

"Integration of Interferometric Synthetic Aperture Radar Data into Geotechnical Planning and Design," Transportation Research Board, Washington, D.C., January 11, 2015 (w/ B. Bruckno).

"Visual media reasoning: Self-nomination in retrieval," DARPA, Arlington, Virginia, February 26, 2014 (w/ K. Skadron, S. Ozer).

"Updates to applications of Interferometric Synthetic Aperture Radar to sinkhole detection and rock slope monitoring," Transportation Research Board, Washington, D.C., January 12, 2014 (w/ B. Bruckno).

"Image Analysis Challenges in the Drosophila Neurome," Plenary Talk, Video Bioinformatics Conference, UCLA Conference Center, December 6, 2013.

"Blood and Neurons – Digital Image Analysis Conquers ALL," Penn State University, March 22, 2013.

"Image Analysis in Neuromics," Bioinformatics 2012, Dresden Germany, September 19, 2012.

"Image Analysis in Biology: From Blood to Fruit Flies," Iowa State University, September 14, 2012.

"Image Analysis in Heterogeneous Computer Systems," Cloud Day, Washington DC, May 17, 2012.

"Object Identification and Dynamics in Biological Images," ISBI, Barcelona, Spain, May 1, 2012.

"Investigating Interferometric Synthetic Aperture Radar for Transportation Infrastructure Monitoring," Transportation Research Board, Washington DC, January 22, 2012.

"Electrical Engineering Attacks Biology with Image Analysis," Old Dominion U., Norfolk, VA, February 9, 2012.

"Image Analysis for UAVs," Bosh, Charlottesville, VA, November 17, 2011.

"ATR: Not just for the Battlefield Anymore," MITRE, July 11, 2011.

"Image Analysis at Virginia," DARPA, Falls Church, VA, June 1, 2011.

"Challenges in Biological Image Analysis: Blood and Brains," Purdue University, April 22, 2011.

"Detection of Sinkholes using InSAR Imagery," Dept. of Transportation, Washington DC, February 2, 2011.

"The Next Grand Challenge for Image Analysis: the Neurome," Groningen University, Netherlands, November 23, 2010.

"Can Image Processing Help Neuroscience?" Shanghai Jiao Tong University, Shanghai, China, September 24, 2010.

"Biomedical Image Analysis," Waterloo University, Waterloo, Ontario, Canada, July 8, 2010.

"A Graph theoretic Approach to Neuron Segmentation," HHMI Janelia Farm, Ashburn, Virginia, May 11, 2010.

"Cellular Level Image Analysis," U. of Aachen, Aachen, Germany, April 20, 2010.

"Image and Video Analysis at the University of Virginia," Advanced Research Institute Seminar, Charlottesville, Virginia, March 4, 2010.

"Image and Video Analysis," IARPA program director briefing, Charlottesville, Virginia January 13, 2010.

"Image Analysis at the Cellular Level," ECE Eminent Speaker, Carnegie Melon U., April 2, 2009.

"Billy the Kid and The Fourier Transform," LASE 360: UVA's Unforgettable Lectures, March 11, 2009.

"Cellular Image Analysis in 2009," U. of Alberta, March 20, 2009.

"Advanced Image Segmentation using Active Models," AFRL Meeting, Pittsburgh, November 2, 2009.

"Image Analysis at the Cellular Level," IMVIP Plenary Talk, September 2, 2009.

"The Future: Cellular Image Analysis," U. of New Mexico, April 25, 2008.

"The Future: Cellular Image Analysis," U. of Texas, February 19, 2008.

“Linear Filters,” U. of Texas, February 21, 2008.
“Analysis of Intravital Microscopic Images of Rolling Leukocytes,” U.C.S.B., January 18, 2008.
“The Future: Cellular Image Analysis,” New Mexico State University, March 13, 2008.
“Anisotropic Diffusion,” U. of Texas, February 20, 2008.
“The Future: Cellular Image Analysis,” Texas Tech University, April 11, 2008.
“Anisotropic Diffusion,” U. of New Mexico, March 10, 2008.
“Speckle Reducing Anisotropic Diffusion,” U. of New Mexico, March 31, 2008.
“Image and Video Analysis Research at VIVA,” Department of Homeland Security, July 9, 2007.
“Automated Detection and Tracking of Cells,” Boston College, Chestnut Hill, Massachusetts, April 24, 2007.
“Content Based Image Retrieval,” Lockheed Martin, Rockville, Maryland, January 29, 2007.
“CellTrek: a Tool for Drug Discovery and Validation,” Darden School of Business, U.Va., Charlottesville, Virginia, October 24, 2006.
"The Aorta Stomp: Image Analysis for Leukocytes and the Myocardium," BME Seminar Series, University of Virginia, Charlottesville, September 24, 2004.
"Detection and tracking of rolling leukocytes from intravital microscopy," IEEE Int. Symp. On Biomedical Imaging, Invited Session on Image Formation and Analysis in Microscopy, Arlington, Virginia, April 16, 2004.
"Tracking Targets: from Military to Biomedical," Air Force Research Laboratory Invited Lecture, Boston, Massachusetts, March 2, 2004.
"Snakes, blood and pixels," U. of Maryland Center for Automation Research Invited Lecture, College Park, Maryland, November 21, 2003.
"Tracking Targets through Scale Changes and Clutter using a Monte Carlo Method," Army Research Laboratory, Adelphi, Maryland, May 19, 2003.
"Enhancements to Image2000," Invited Talk, NASA Goddard, Maryland, July 3, 2002 (with Kate Weber).
"Signal and Image Compression," Naval Surface Warfare Center, Dahlgren Division, Virginia, November 13, 2002.
"Tracking Leukocytes using Active Contours," Imaging Science, Boston, Mass., March 4, 2002.
"Simplifying the Use of Automated Liquid Handling Robotics Using Computer Vision," LabAutomation 2002, Palm Springs Convention Center, CA, January 26-30, 2002 (with Joseph Bosworth, Chris Estey and Robin Felder).
"Attacking Inflammatory Disease with Snakes: Intravital Video Tracking for Rolling Leukocytes," Biomedical Engineering Seminar, Charlottesville, Virginia, October 19, 2001.
"Image Segmentation with Application to Medical Imaging," Invited Seminar, NIH, Bethesda, Maryland, October 24, 2000.
"Image and Video Processing Using Anisotropic Diffusion," Invited Seminar, Center for Imaging Science, Johns Hopkins University, October 23, 2000.
"NASA-related Image Processing Research at the University of Virginia," Invited Talk, NASA Goddard, Maryland, October 23, 2000.
"Image Segmentation and Medical Applications," Invited Seminar, Varian Medical Systems, Charlottesville, Virginia, October 5, 2000.
"Diffusion-based Image and Video Processing," Plenary Talk, International Conference on Advances in Pattern Recognition and Digital Techniques, ICAPRDT '99, Calcutta, India, December 28, 1999.
"Document page segmentation using multiscale clustering," IEEE Int. Conf. on Image Processing

Special Session on Document Compression, Kobe, Japan, October 25, 1999.
"PDE-based Video Processing," Northwestern University invited seminar, Evanston, Illinois, February 17, 1999.
"Image Diffusion," Wichita State University Seminar Series, Wichita, Kansas, September 18, 1998.
"Multiscale Video Tracking and Related Topics," Science Applications International Corporation (SAIC), Denver, August 7, 1998.
"Image Diffusion," University of Texas Signal Processing Seminar, Austin, March 12, 1998.
"The Miracle of Vision," Fellowship of Christian Faculty and Staff, Stillwater, March 25, 1998.
"Anisotropic Diffusion," OSU Center for Laser and Photonics Research Colloquium, Stillwater OK, March 27, 1998.
"Order statistic filters," Electrical and Computer Engineering Seminar, University of Oklahoma, Norman, March 30, 1998.
"Image enhancement and binary image processing," Electrical and Computer Engineering Seminar, University of Oklahoma, Norman, Feb. 11, 1998.
"Annealing methods for high-speed optimization," U. of Houston Computer Science Invited Talk, Houston, May 11, 1993.

RESEARCH FUNDING

Title: Machine Learning Assisted Analysis of Classroom Observation Video
Source: Bill and Melinda Gates Foundation
Duration: November 2024 – October 2027

Title: EAGER: Spatiotemporal Transformer for Activity Recognition
Source: NSF
Duration: July 2023 – June 2025

Title: Creating InstructionNet
Source: Schmidt Futures
Duration: January 2023 – December 2026

Title: Non-Invasive Single-Cell Morphometry and Tracking in Living Bacterial Biofilms
Source: NIH R01
Duration: October 2020 – October 2024

Title: Secondarily generalized tonic clonic seizure: a functional anatomy
Source: NIH R37
Duration: September 2021 – August 2025

Title: Using Neural Networks for Automated Classification of Elementary Mathematics Instructional Activities
Source: NSF
Duration: September 2020 – August 2024

Title: CISE/CCF IPA Agreement

Source: NSF
Duration: September 2019 – August 2022

Title: A Deep Reinforcement Learning based Long-term Tracker for Salient Event Detection
Source: ARO
Duration: July 2020 – June 2023

Title: Using Neural Networks for Automated Classification of Elementary Reading and Mathematics Instructional Activities
Source: Robertson Foundation
Duration: July 2020 – June 2023

Title: ABI: Innovation: Analyzing Neuroglial Cell Dynamics in their Natural Environment with Video Microscopy
Source: NSF
Duration: March 2018 – February 2021

Title: A systems approach to understanding a neuronal circuit for detecting motion
Source: Three Cavaliers
Duration: March 2019 – February 2020

Title: Myeloid Cell Control Of CNS Infection
Source: NIH
Duration: March 2019 – February 2020

Title: Data Science Fellowship: Visualizing Cellular Behaviors in Bacterial Biofilms using Lattice Light Sheet Microscopy
Source: DSI
Duration: June 2019 – May 2020

Title: Image Analysis, Machine Learning and Advanced Imaging for Brain Immunology
Source: SEAS Research Innovation Award
Duration: August 2017 – August 2018

Title: Case-based Curricular Integration of Systems Thinking
Source: SEAS Teaching Innovation Award
Duration: August 2017 – August 2018

Title: Graph-based representations and multifidelity machine learning for anthropometrics-based human identity recognition
Source: Army Night Vision and Electronics Sensors Directorate
Duration: January 2017 – March 2020

Title: Automating Glia Neuroimaging
Source: UVA Brain
Duration: January 2017 – January 2018

Title: Breaking Barriers to Building Better Brains
Source: SEAS Research Innovation Award
Duration: August 2016 – August 2017

Title: Harnessing the Power of Bacterial Populations
Source: Jeffress Trust
Duration: June 2016 – August 2017

Title: A Sparse Coding Approach to Spatiotemporal Saliency Detection in Image and Video Databases
Source: ARO
Duration: June 2015 – May 2018

Title: Bioimage Informatics for the Neurome
Source: Hobby Foundation
Duration: May 2015 – April 2017
Co-PIs: S.T. Acton, B.G. Condron

Title: Autoimage Development, Neuronal Degeneration and Stem Cell Adhesion
Source: Jeffress Trust
Duration: June 2015 – March 2017

Title: Activity Detection & Retrieval for Image & Video Data with Limited Training
Source: ARO
Duration: August 2014 – May 2015

Title: InSAR Remote Sensing for Performance Monitoring of Transportation Infrastructure at the Network Level
Source: U.S. DOT
Duration: January 2014 - January 2016

Title: ABI Innovation: Towards the Neurome -- Automated Image Analysis for Neuroinformatics
Source: NSF
Duration: May 2011 - April 2016 (on no-cost extension)

Title: Historical Study of Displacements at the Approaches to the Monitor Merrimac Memorial Bridge Tunnel
Source: VDOT
Duration: November 2013 - June 2014

Title: Prototype for Meta-Algorithmic, Content-Aware Image Analysis
Source: DARPA
Duration: June 2012 - July 2014

Title: Surface Characterization and Identification
Source: CCAM
Duration: January 2012 – January 2014

Title: Sinkhole Detection & Bridge/Landslide Monitoring for Transportation Infrastructure by Automated Analysis of Interferometric Synthetic Aperture Radar Images
Source: DOT
Duration: July 2011 - July 2013

Title: Portable Ultrasound Image Analysis
Source: Army SBIR through PocketSonics, Inc.
Duration: January 2013 – July 2013

Title: Tracking and Image Characterization Research
Source: Night Vision, ARL via CACI, Inc. (CACI is the main contractor; UVA is a sub)
Duration: June 2010 - May 2014

Title: Video Data Mining and Target Tracking: A Model Adaptation and Feedback Control Approach
Source: ARO
Duration: September 2010 - August 2014

Title: High Resolution 3D Ultrasound Imaging and Quantification of the Murine Heart
Source: NIH
Duration: August 2009 - September 2013

Title: Tracking and Classification Services III (add-on to previous NRO work)
Source: NSF WiCAT Center (NRO project)
Duration: Apil 2008 - December 2008

Title: Tracking and Image Characterization Research
Source: Night Vision, ARL via CACI, Inc. (CACI is the main contractor; UVA is a sub)
Duration: June 2007 - May 2010

Title: Pilot Study of the Dermagram
Source: Swortzel Foundation
Duration: May 2008 - April 2009

Title: Tracking and Classification Services II (add-on to previous NRO work)
Source: NSF WiCAT Center (NRO project)
Duration: January 2008 - December 2008

Title: STIR: Model Adaptation and Feedback Control in Multi-Sensor Image Fusion and Multiple Target Tracking
Source: Army Research Office
Duration: September 2007 – May 2008

Title: SEI: Hierarchical Dependency Graphs for Col-Space Design with Application to Leukocyte Detection and Tracking
Source: NSF
Duration: June 2006 – May 2009

Title: Sequential Monte Carlo Method for Real-time Tracking of Multiple Targets
Source: Army Research Office
Duration: July 2006 – June 2008

Title: Image Processing Architecture in Support of Mobile Users with Limited Support Technology
Source: NRO through NSF WiCAT Center
Duration: January 2007 - December 2007

Title: Automated hemodynamic analysis in microvessels using μ-particle image velocimetry
Source: NIH
Duration: December 2005 - November 2007

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.
Duration: June 2004 – January 2006

Title: Real-time Hardware for Enhancement and Segmentation of Ultrasonic Imagery of the Prostate
Source: Mellon Prostrate Cancer Research Institute
Duration: October 2003 – September 2005

Title: MRI of myocardial function in post-infarct knockout mice
Source: NIH
Duration: January 2004 – December 2007

Title: High Resolution Anatomic and Elastographic Transrectal Ultrasound for Improved Diagnosis of Prostate Cancer
Source: U.S. Army Medical Research and Materiel Command
Duration: January 2004 – December 2006

Title: Quantitative 3D Ultrasound Imaging of The Murine Heart
Source: NIH
Duration: January 2004 – December 2006

Title: System for Automated Tracking of Leukocytes *In Vivo* (R33 Mechanism)
Source: NIH
Duration: October 2002 – September 2005

Title: System for Automated Tracking of Leukocytes *In Vivo* (R21 Mechanism)
Source: NIH
Duration: October 2001 – September 2002

Title: Decentralized Image Retrieval for Education
Source: NSF
Duration: January 2002 – December 2004

Title: Advanced Biomedical Image Processing for Tracking Leukocytes *In Vivo* from Video Microscopy
Source: Whitaker Foundation (Biomedical Engineering Research Award)
Duration: September 2001 – August 2004

Title: Clutter-reducing, Scalable Image Processing Methods for Target Acquisition and Tracking
Source: U.S. Army Research Office
Duration: May 2001 – April 2004

Title: Advanced Image Processing for Image2000 Enhancements
Source: NASA
Duration: July 2001 – April 2004

Title: Rapid deployment of drug discovery automation using machine vision
Source: Carilion Biomedical Institute
Duration: September 2000 – May 2002

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)
Duration: November 1999 - February 2002

Title: Multiresolution Sensor Fusion Using Morphological Pyramids
Source: NSF
Duration: July 1997 – June 1998

Title: Multiresolution, Multi-Scale Target Identification and Tracking Using the Anisotropic Diffusion Pyramid
Source: U.S. Army Research Office (**Young Investigator Award**)
Duration: September 1995 – August 1998

Title: Processing Digital Images Obtained From Indium Antimonide Sensors
Source: NSF
Duration: August 1996 – July 1997

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

Source: NASA
Duration: November 1996 - November 1999

Title: Fusion of Infrared and X-ray Imagery for Automated Circuit Inspection
Source: Lucent Technologies
Duration: December 1997 – November 1998 (extension)

Title: Vision-based Circuit Board Inspection System
Source: Lucent Technologies
Duration: September, 1996 – November, 1997

Title: Fusion of Infrared and X-ray Imagery for Automated Circuit Inspection (Feasibility Study)
Source: Lucent Technologies
Duration: June 1996 - August 1996

Title: Automated Video Tracking and Inspection (additional time and funds)
Source: SVS, Inc., Albuquerque NM
Duration: October 1995 - July 1996

Title: Image Processing for Agricultural Remote Sensing
Source: Site-Specific Technology Development Group, Stillwater OK
Duration: August 1995 – June 1996

Title: Automated Video Tracking and Inspection
Source: SVS, Inc., Albuquerque NM
Duration: June 1995 – September 1995

GRADUATE STUDENTS DIRECTED

Ph.D. Students — ***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: Founder and Owner at Black Mesa Imaging, LLC)

Yongjian Yu — Spring, 2003
"Ultrasound Image Enhancement for Detection of Contours Using Speckle Reducing Anisotropic Diffusion"
(Currently: Senior Research Engineer with Axon Connected)

Nilanjan Ray — Spring, 2003
"Tracking Rolling Leukocytes In Vivo Using Active Contours with Motion Gradient Vector Flow"
(Currently: Associate Professor at University of Alberta)

Dong Gang — Fall, 2005

"Detection of Rolling Leukocytes from Intravital Microscopy Images"
(Currently: Senior Research Scientist with KLA Tencor)

Jing Cui (co-advised w/ Z. Lin) Spring, 2006
"In Vivo Multi-leukocyte Tracking by Enhanced Particle Filter"
(Currently: with University of Michigan)

Michael Grant Summer, 2006
"Surface Reflected Global Positioning System Signals for Terrain Classification"
(Currently: Chief Engineer w/ NASA Langley Research Center)

Bing Li Summer, 2007
"Image Segmentation Using Vector Field Convolution Active Models and Poisson Inverse Gradient Initialization"
(Currently: General Manager and Cofounder, SVision, Inc.)

Drew Gilliam Summer, 2008
"MRI-assisted Segmentation of Cardiac Ultrasound using Active Trajectory Models"
(Currently: Vision Scientist at Vision Systems, Inc.)

Robert Janiczek Summer, 2012
"Measurement of wall stress using magnetic resonance imaging"
(Currently: Scientific Director, Glaxo Smith Kline)

Saurav Basu Summer, 2012
"Using manifold geometry in image analysis: shape based recognition and pose tracking"
(Currently: with IBM)

Alla Aksel Fall, 2014
"Automated tracking and analysis of aerial surveillance data"
(Currently: with Northrup Grumman)

Andrea Vaccari Spring, 2014
"An automated image analysis framework for model-based feature detection in sparse data"
(Currently: Assistant Professor of Computer Science, Middlebury College)

Suvadip Mukherjee Fall, 2015
"Segmentation and enhancement of filamentous objects for biological image analysis"
(Currently: Senior Engineer with KLA)

Rituparna Sarkar Spring, 2017
"Dictionary learning and sparse representation for image analysis with application to segmentation, classification and event detection"
(Currently: Senior Engineer with KLA)

Tamal Batabyal Spring, 2019
"Graph-theoretic data modeling with application to neuromorphology, activity recognition and event detection"
(Currently with MIT)

Nasrin Sadeghzadehyazdi Spring, 2021
Topic: Image analysis of lidar for person identification
(Currently with Chemours, formerly Dupont)

Tiffany Ly Summer, 2021

Topic: Image analysis of Glia
(Currently with IBM)

Jie Wang — Fall, 2021
Topic: Super-resolution Microscopy Image Analysis
(Currently with Nanjing University of Posts and Telecommunications)

Nazia Tabassum — Spring, 2021
Topic: Image Analysis for Meningeal Lymphatics
(Currently with SAS Institute)

Haoyi Ma — Spring, 2022
Topic: Long-term Video Tracking, Reinforcement Learning for Tracking
(Currently with Meta)

Tanjin Toma — Spring, 2024
Topic: Tracking of bacteria in biofilms
(Currently with NIH)

Samarth Singh — Summer, 2025 (expected)
Topic: Machine learning for focused ultrasound therapy

Soumee Guha — Fall, 2025 (expected)
Topic: Machine learning in video analysis

Jonathan McGee — Spring, 2028 (expected)
Topic: Machine learning in video analysis

Chongyu He — Spring, 2028 (expected)
Topic: Machine learning in video analysis

M.S. Students — ***Graduation Date***

Auapong Yaicharoen — Summer, 1995
"The Anisotropic Diffusion Coefficient"
(Currently: 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: U.S. Air Force)

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: Sharp USA Research)

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"
(Currently at GSK)

John Pickard — Spring, 2005
"Automated MCE Perfusion Analysis"
(Currently with UVA Patent Foundation)

Bing Li — Spring, 2005
"Multiassignment Interactive Multiple Model for Multiple Target Tracking"
(Currently with SVision, Inc.)

Marija Cvijetic — Summer, 2007
"Intravital Cell Detection"
(Currently with Anderson Consulting)

Adam Bergeron — Spring, 2008
"Video Tracking Using Base View Active Contours"
(Currently with Lockheed Martin)

Katherine Outland (Co-advised with Barry Johnson) — Spring, 2008
"Face Detection and Tracking via Active Contours"
(Currently with MITRE Corp.)

Josh Poulin — Spring, 2010
"Human pose tracking from monocular video"
(Currently with Air Force Research Labs)

Michael Landau — Spring, 2011
"Adaptive acceptance gate for target tracking"
(Currently with APL, Johns Hopkins U.)

Kirill Orlov — Spring, 2012
"The missing cone problem in hyperspectral imaging"

Clare Yang — Summer, 2012
"Multiscale Vector Field Convolution for Image Segmentation"

Michael Stuecheli — Fall, 2013
"Image analysis methods for locating geohazards"

Anoosha Papireddy — Summer, 2013
"Image segmentation for multimodal radiography"
(Currently with Google)

Nazia Tabbasum — Summer, 2016
"Speckle Removal and Change Preservation by Distance-Driven Anisotropic Diffusion of Synthetic Aperture Radar Temporal Stacks"

Jie Wang — Spring, 2017
"3D Segmentation for Super-Resolution Imaging of Bacterial Biofilms"

Tiffany Ly — Spring, 2017
"IP on AP: Exploring Image Processing on the Automata Processor"

Filip Sluzeski — Summer, 2019
"Methods for Analyzing Microglial Signaling and Cortical Spreading Depression Wavefronts in 2-Photon Calcium Images"
(Currently with Allen Institute for Brain Science)

- *Not Listed*: over 30 undergraduate theses

Visitors and Postdoctoral Fellows

Dr. Alfredo Restrepo, Summer 1998
Current position: Professor, Universidad de los Andes, Bogota, Colombia

Dr. Dipti Prasad Mukherjee, 1999-2000, 2001-2002, 2013
Current position: Professor, Indian Statistical Institute, Calcutta, India
Dr. Nilanjan Ray, Research Associate, 2003-2005, 2013
Current position: Professor, University of Alberta, Alberta, Canada
Dr. Jinshan Tang, Research Scientist, 2002-2005
Current position: Professor, George Mason University
Dr. Peter Tay, Research Associate, 2005-2006
Current position: Professor, W. Carolina University
Dr. Sedat Ozer, Research Associate, 2013-2015
Current position: Research Scientist, M.I.T.
Dr. Andrea Vaccari, Research Scientist, 2014-2019
Current position: Assistant Professor, Middlebury College
Dr. Matthew Korban, Research Associate, 2022-
Dr. Felix Mo, Research Associate, 2023-2024

SERVICE TO THE UNIVERSITY

- Member, UVA AI Hiring Committee, 2024-
- Member, AI @ UVA, 2024-
- Member, UVA Futures Initiative, 2024-
- Member, Provost's Advisory Committee on Artificial Intelligence, 2023-
- Chair, ECE Turtles (leadership council), 2022-
- Member ex-officio, ECE Finance Committee, 2022-
- Member, SEAS Dean's Advisory Council, 2022-
- Member, SEAS Chair's Development, 2022-
- Graduate, Leadership in Academic Matters, University of Virginia, 2021
- Senator, Faculty Senate, University of Virginia, 2018-2019
- Chair, Neural Engineering Search committee, 2016-2019
- Member, SEAS Tenure and Promotions Committee (out of cycle cases), 2018
- Member, ECE P&T Process Support Committee, 2018-2019
- Member, University Committee on Information Technology, 2018-2019
- Member, SEAS Faculty Council, 2018-2019
- Member, Diversity and Inclusion Committee, UVA, 2018-2019
- Member, UVA Fontaine Research Building Committee, 2018-2019
- Member, Neuroscience internal review committee, 2017-2019
- Member, Neuroscience Cluster hiring committee, 2017-2019
- Member, CS Peer Assessment Committee, 2016, 2017
- Member, Search Committee, ECE Department Chair, 2017
- Member, SEAS Tenure and Promotions Committee, 2013-2015
- Chair, Search Committee (two positions), ECE, 2013-2014
- Member, ECE Peer Assessment Committee, 2013
- Chair, SEAS Graduate Module implementation committee, 2011-2014
- Member, ECE Chair Search Committee, 2012
- Member, ECE Search committee (opto-electronics), 2013
- Member, ECE ASSET speaker committee, 2012-2014

- Member, SEAS strategic planning (graduate module), 2010-2011
- Member, Committee on Post-Tenure Review and Teaching Load Policy, 2010-2011
- Chair, ECE Graduate Fellowships Committee, 2009-2013
- Chair, ECE Eminent Speaker Series, 2004-2007
- Chair, ECE Graduate Recruiting Committee, 2003-2007
- Member, ECE Faculty Recruiting Committee, 2004-2007
- Member, ECE Faculty Recognition Committee, 2003-2007
- Member, Dean's Research Advisory Council, SEAS, 2003-2007
- Member, Nominations and Elections Committee, SEAS, 2003-2007
- 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, 2004-2007
- 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, STS 401/402 Committee, 2001-2004
- 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

SERVICE TO THE PROFESSION

Membership in Professional Societies

- Institute of Electrical and Electronics Engineers (IEEE), Fellow
- Signal Processing Society of the IEEE
- Engineering in Medicine and Biology Society of the IEEE
- Virginia Neuroscience Initiative
- American Society for Engineering Education (ASEE)
- American Institute for Medical and Biomedical Engineering (AIMBE), Fellow
- American Association for the Advancement of Science (AAAS)

Editorial Work

- **Editor-in-Chief, *IEEE Transactions on Image Processing*, 2014-2018**
- Guest Editor, *IEEE Journal on Biomedical and Health Informatics*, Special Issue on Large scale video analytics for clinical decision support, 2021-2022
- Guest Editor, *IEEE Journal on Special Topics in Signal Processing*, Special Issue on Machine Learning for Medicine, 2019-2020
- Guest Editor, *IEEE Journal on Special Topics in Signal Processing*, Special Issue on Bioimaging, 2014-2015
- Associate Editor, *IEEE Transactions on Image Processing*, 1997-2003, 2007-2011, 2013- 2014
- Associate Editor, *IEEE Signal Processing Letters*, 2001-2004
- Guest Editor, Special Issue on Multimedia System Technologies for Educational Tools, *Multimedia Systems Journal*, 2005

IEEE (or other international) Committees

- Member, Awards Board, IEEE Signal Processing Society, 2024-
- Member, IEEE Fellow Evaluating Committee, 2023-2024, Signal Processing Society
- Member, IEEE Fellow Evaluating Committee, 2022-2023, Engineering in Medicine and Biology Society
- Member (elected), IEEE Bioimaging and Signal Processing Technical Committee, 2019-2022
- Asilomar SS&C Conference Corporation Board of Directors, Member, 2008-2023
- Member, IEEE SPS Technical Directions Board (ISBI Representative), 2018-2019
- Member, IEEE Fellow Evaluating Committee, 2017-2019, Engineering in Medicine and Biology Society
- Member, IEEE Signal Processing Society Publications Board, 2015-2018
- Chair, IEEE Bioimaging and Signal Processing Technical Committee Awards Board, 2013-2014
- Member, IEEE Image, Video, and Multidimensional Signal Processing Technical Committee, 2011-2016 (re-elected in 2013)
- Member, IEEE Bioimaging and Signal Processing Technical Committee, 2011-2016 (re-elected in 2013)

Conference Organization and Leadership

- Organizing Committee, VASEM AI Summit, 2025
- North American Liaison Chair, IEEE International Conf. on Image Processing, 2019

- **General Co-Chair**, IEEE Int. Symposium on Biomedical Imaging, 2018
- Associate Editor, IEEE International Symposium on Biomedical Imaging, 2017
- Student Paper Contest Chair, Asilomar Conf. on Signals, Systems and Computers, 2017
- Student Paper Contest Chair, Asilomar Conf. on Signals, Systems and Computers, 2016
- Special Sessions Chair, IEEE Southwest Symposium on Image Understanding and Interpretation, 2016
- North American Liaison, IEEE International Conf. on Image Processing, 2019
- Awards Chair, IEEE GlobalSIP, 2015
- SPS Liaison to ISBI, 2013-
- Technical Area Chair, IEEE International Conf. on Image Processing, 2013
- Program Committee, 2013 Computational Imaging Conference
- Publicity Chair, 2013 IEEE International Symposium on Biomedical Imaging
- Technical Area Chair, IEEE International Conf. on Image Processing, 2011
- Technical Area Chair, IEEE International Symposium on Biomedical Imaging, 2011
- **General Co-Chair**, 2010 IEEE SW Symposium on Image Analysis and Interpretation
- Vice Technical Chair, 43nd Asilomar Conf. on Signals, Systems and Computers, 2009
- Finance Chair, 2009 IEEE International Symposium on Biomedical Imaging
- Technical Area Chair, 42nd 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 Southwest Symposium on Image Understanding and Interpretation
- Technical Area Chair, IEEE International Conf. on Image Processing, 2009
- Technical Area Chair, IEEE International Conf. on Image Processing, 2008
- Special Sessions Chair, IEEE International Conf. on Image Processing, 2007
- **General Chair**, 40th Asilomar Conf. on Signals, Systems and Computers, 2006
- **Technical Program Chair**, 38th Asilomar Conf. on Signals, Systems and Computers, 2004
- Student Paper Contest Chair, 37th Asilomar Conf. on Signals, Systems and Computers, 2003
- Track Chair, 45th Midwest Symposium on Circuits and Systems, 2002 (in charge of organizing five sessions in the image processing area)
- Technical Area Chair, 35th Asilomar Conf. on Signals, Systems and Computers, 2001 (in charge of organizing nine sessions in the signal & image processing area)
- Technical Area Chair, 34th 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 SW Symposium on Image Understanding and Interpretation
- *Not listed*: >50 technical program committees and >45 session chairs

Service at the National Science Foundation

- **Member, NSF CISE Advisory Committee, 2024-2025**

- Acting Deputy Division Director, Computing and Communication Foundations, 2021-2022
- Program Director, Communication and Information Foundations (within CISE-CCF), 2019-2022
- Program Director, Smart and Connected Health, 2019-2022
- Program Director, National Robotics Initiative, 2019-2020
- Program Director, Foundational Research in Robotics, 2020-2022
- Program Director, Predictive Intelligence for Pandemic Prevention, 2021-2022
- Program Director, Artificial Intelligence Institutes, 2020-2022
- Member, Committee on Pandemic Predictive Intelligence, 2020-2022
- Member, CISE Committee on Diversity in Panels, 2020-2022
- Member, Working Group on Large Proposals, 2021-2022
- Member, Tiger Team on Hybrid Panels, 2021
- *Not listed*: proposal reviewer for NSF, ARO, NIH (study section), Portuguese NSF, Hobby Foundation, state of Virginia, Michigan Technology Corridor, UVA, Nebraska, Tennessee, Netherlands, CRDF