

THOMAS S. DENNEY JR.

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GENERAL INFORMATION

Current Position

Professor
Department of Electrical and Computer Engineering
Auburn University

Research Interests

Magnetic resonance imaging, computed tomography, biomedical imaging, image analysis, image processing, deformable motion estimation, computer/robot vision, modeling/estimation of multi-dimensional stochastic processes, inverse problems, mathematical modeling and simulation, data visualization.

EDUCATION

B.S. 1985, Electrical Engineering, Auburn University (Summa Cum Laude)
M.S. 1990, Electrical Engineering, Auburn University
Ph.D. 1994, Electrical and Computer Engineering, The Johns Hopkins University

EMPLOYMENT

Electrical Engineer, IBM Corporation, 1985-1986.
Marketing Representative, IBM Corporation, 1986-1988.
Teaching/Research Assistant, Auburn University, 1989-1990.
Member of Summer Staff, Johns Hopkins University Applied Physics Laboratory, 1990.
Teaching/Research Assistant, The Johns Hopkins University, 1990-1994.
Assistant Professor, Auburn University, Electrical Engineering Department, 1994-1999.
Associate Professor, Auburn University, Electrical and Computer Engineering Department, 1999 – 2006.
Professor, Auburn University, Electrical and Computer Engineering Department, 2006 – present.

HONORS AND AWARDS

Central Bank Scholarship, 1985.

IEEE Signal Processing Society 1996 Young Author Best Paper Award (Image and Multidimensional Signal Processing Area).

Auburn University Panhellenic Council Outstanding Professor, Winter Quarter 1999.

Outstanding Faculty Member 1999-2000, Department of Electrical and Computer Engineering, Auburn University

Outstanding Faculty Member 1999-2000, College of Engineering, Auburn University

Fred H. Pumphrey Outstanding Teaching Award, 1999-2000, College of Engineering, Auburn University

Walker Merit Teaching Award, 2000-2001.

PROFESSIONAL ACTIVITIES

Editorial Boards

Associate Editor, IEEE Transactions on Image Processing (2005-2008).

Associate Editor, SPIE Journal of Electronic Imaging (2004-present).

Technical Committees

Member, IEEE Bio Imaging and Signal Processing (BISP) Technical Committee (2007-present)

Conference Organization

Program Chair, 2007 IEEE International Symposium on Biomedical Imaging

Steering Committee, IEEE International Symposium on Biomedical Imaging (2005/2006)

Program Committee, 2006 IEEE International Symposium on Biomedical Imaging

Program Committee, Computational Imaging IV Conference, SPIE Electronic Imaging (EI) 2006

Program Committee, Computational Imaging III Conference, SPIE Electronic Imaging (EI) 2005

Session Chair, Computational Imaging III Conference, SPIE Electronic Imaging (EI) 2005

Track Chair (Cardiac Imaging), 2004 IEEE Engineering in Medicine and Biology Society Conference

Publications Chair, 2004 IEEE International Symposium on Biomedical Imaging

Program Committee, Computational Imaging II Conference, SPIE Electronic Imaging (EI) 2004

Session Chair, Computational Imaging II Conference, SPIE Electronic Imaging (EI) 2004

Session Chair, 10th Meeting of the International Society for Magnetic Resonance in Medicine (ISMRM) 2002

Session Chair, 2002 IEEE International Symposium on Biomedical Imaging

Session Chair, 16th Southern Biomedical Engineering Conference

NIH Study Sections

Member, NIH Small Business Medical Imaging Study Section, (2007-present).

Bioengineering Partnership Study Section, Special Emphasis Panel/Scientific Review Group 2005/10 ZRG1 SBIB-J (50) (R) June 13, 2005.

Special Emphasis Panel for Review of Applications for National Centers of Biomedical Computing-ZRG1 BST-A(55)R, May 26-27, 2004.

Journal, Conference, and Textbook Reviewing

Reviewer for IEEE Transactions on Medical Imaging

Reviewer for IEEE Transactions on Image Processing

Reviewer for IEEE Transactions on Industrial and Electronic Systems

Member of the 1997 IEEE International Conference on Image Processing (ICIP'97) Program Committee

Reviewer for the Meeting of the International Society for Magnetic Resonance in Medicine (ISMRM) 1997-2004.

Reviewer for the IEEE Industrial Electronics Conference (IECON) 1995-1999.

Reviewer for CDC'96

Book reviewer for McGraw-Hill and McGraw-Hill/Irwin.

Professional Society Memberships

Member of IEEE

Member of IEEE Signal Processing Society

Member of IEEE Engineering in Medicine and Biology Society

Member of the International Society for Magnetic Resonance in Medicine (ISMRM)

UNIVERSITY COMMITTEES

College of Engineering Graduate Faculty Membership Committee

University Academic Honesty Committee

Chair, University Library Committee

University Campus Planning Committee

PUBLICATIONS

Refereed Journals

1. T.S. Denney Jr. and M.E. Greene, "On State Estimation for an Orbiting Single Tether System," *IEEE Trans. on Aerospace and Electronic Systems*, vol. 27, no. 4, pp. 689-695, July, 1991.
2. M.E. Greene and T.S. Denney Jr., "Real-Time Estimator for Control of an Orbiting Single Tether System," *IEEE Transactions on Aerospace and Electronic Systems*, vol. 27, no. 6, pp. 880-883, November, 1991.
3. T.S. Denney Jr. and J.L. Prince, "Optimal Brightness Functions for Optical Flow Estimation of Deformable Motion," *IEEE Transactions on Image Processing*, vol. 3, no. 2, pp. 178-191, March, 1994. **IEEE Signal Processing Society 1996 Young Author Best Paper Award (Image and Multidimensional Signal Processing Area)**
4. T.S. Denney Jr. and J.L. Prince, "A Frequency Domain Performance Analysis of Horn and Schunck's Optical Flow Algorithm for Deformable Motion," *IEEE Transactions on Image Processing*, vol. 4, no. 9, pp. 1324-1327, September, 1995.
5. T.S. Denney Jr. and J.L. Prince, "Reconstruction of 3-D Left Ventricular Motion from Planar Tagged Cardiac MR Images: An Estimation Theoretic Approach," *IEEE Transactions on Medical Imaging*, pp. 625-636, December 1995.
6. T.S. Denney Jr. and E.R. McVeigh, "Model-Free Reconstruction of Three-Dimensional Myocardial Strain from Planar Tagged MR Images," *Journal of Magnetic Resonance Imaging*, vol. 7, no. 9, pp. 799-810, September/October, 1997.

7. J.D. Warren^{*}, T.S. Denney Jr., and C.E. Savrda, "MATLAB Algorithm for Grayscale Analysis of Carbonate Cyclicity: Example Application to Demopolis Chalk (Cretaceous, Alabama)," *Computers in the Geosciences*, vol. 24, no. 10, pp 923-921, 1998.
8. T.D. Nguyen, S.J. Reeves, and T.S. Denney, Jr., "Optimal pulse shape for estimating positions of superimposed pulses," *IEEE Transactions on Signal Processing*, vol.47, no. 1, pp. 210-213, Jan. 1999.
9. T.S. Denney Jr., "Estimation and detection of myocardial tags in MR images without user defined myocardial contours," *IEEE Transactions on Medical Imaging*, vol. 18, no. 4, pp. 330-344, April 1999.
10. Z. Han and T.S. Denney Jr., "A New Method for Brownian Motion Interpolation," *IEEE Transactions on Signal Processing*, vol. 47, no.11, pp. 3159-3163, Nov. 1999.
11. J. Declerck, T.S. Denney Jr., W. O'Dell, C. Ozturk, E.R. McVeigh, "Left ventricular motion reconstruction from planar tagged MR images: a comparison," *Physics in Medicine and Biology*, vol. 45, no. 6, pp. 1611-1632, June, 2000.
12. Z. Han and T.S. Denney Jr., "Incremental Fourier Interpolation of 2-D Fractional Brownian Motion," *IEEE Transactions on Industrial Electronics*, vol. 48, no. 5., pp 920-925, Oct. 2001.
13. T. D. Nguyen, S. J. Reeves, and T.S. Denney Jr., "Optimal Magnetic Resonance Tagged Images for Heart Wall Motion Estimation," *IEEE Transactions on Image Processing*, v. 12, n. 5, pp 524-532, May, 2003.
14. T.S. Denney Jr., B.L. Gerber, and L. Yan, "Unsupervised Reconstruction of Three-Dimensional Left Ventricular Strain from Parallel Tagged Cardiac Images," *Journal of Magnetic Resonance in Medicine*, v49, n4, pp.743-754 April 2003.
15. D. Xiang and T.S. Denney Jr, "3D Myocardial Strain Strain Reconstruction From Tagged MRI Using a Cylindrical B-spline Model," *IEEE Transactions on Medical Imaging*, v23, n7, pp 861-867 July 2004.
16. D. Xiang and T.S. Denney Jr, "Combined Tag Tracking and Strain Reconstruction From Tagged Cardiac MR Images Without User-Defined Myocardial Contours," *Journal of Magnetic Resonance Imaging*, v21, n1, pp. 12-22, January 2005.
17. T.S. Denney Jr. and S.J. Reeves, "Bayesian Image Reconstruction From Fourier-Domain Samples Using Prior Edge Information," *Journal of Electronic Imaging*, v14, n4, October-December 2005, pp. 043009-1 to 043009-11.
18. M. Bertus, T.S. Denney Jr., J. Godbey, and C. Hinkelmann, "Noise, Bubbles and Equity Prices: Evidence from the Stock Index Futures Market," *Financial Review*, In Review.
19. J. Li and T.S. Denney Jr., "Left Ventricular Motion Reconstruction From Planar-Tagged Magnetic Resonance Images With A Prolate Spheroidal B-Spline Model," *Physics in Medicine and Biology*, v51, n3, Feb 2006, pp 517-537.
20. M.S. Kirugulige, H.V. Tippur and T. S. Denney Jr. Measurement of transient deformations using digital image correlation method and high-speed photography: Application to dynamic fracture," *Applied Optics*. v48, n22, Aug 2007, pp 5083-5096.
21. Denney Jr., T.S., Nagaraj, H.M., Lloyd, S.G., Aban, I, Corros, C., Seghatol-Eslami, F., Dell'Italia, L.J., Gupta, H., "Primary mitral regurgitation does not cause left ventricular dyssynchrony," *American Journal of Cardiology*, v100 n4 Aug 2007 707-711.
22. Ruzsics B, Surányi P, Kiss P, Brott BC, Litovsky S, Denney TS Jr, Aban I, Lloyd SG, Simor T, Elgavish GA, Gupta H., "Myocardial strain in sub-acute peri-infarct

myocardium," *International Journal of Cardiovascular Imaging*, v25, n2, Feb 2009, pp 151-159.

23. Pat B, Killingsworth C, Denney T, Zheng J, Powell P, Tillson M, Dillon AR, Dell'Italia LJ., "Dissociation between cardiomyocyte function and remodeling with beta-adrenergic receptor blockade in isolated canine mitral regurgitation," *American Journal of Physiology Heart and Circulatory Physiology*, v295, n6, pp H2321-2327, Dec. 2008.
24. Zheng, J, Chen, Y, Pat, B, Dell'Italia, A, Tillson, M, Dillon, AR, Powell, P, Shi, K, Shah, Denney, TS, Husain, A, Dell'Italia, LJ, "Microarray Identifies Extensive Downregulation of Noncollagen Extracellular Matrix and Profibrotic Growth Factor Genes in Chronic Isolated Mitral Regurgitation in the Dog," *Circulation*, To Appear.

Invited Papers

25. T.S. Denney Jr., "Estimation and Identification," *The CRC Industrial Electronics Handbook*, ed. J. David Irwin, 1995.
26. T.S. Denney Jr., "Automated Tag Detection," *Measurement of Cardiac Deformation from MRI: Physical and Mathematical Models*, eds. A.A Amini and J.L. Prince, Kluwer Academic Publishers, 2001.

Refereed Article-Length Papers in Conference Proceedings

27. T.S. Denney Jr. and J.L. Prince, "3D Displacement Field Reconstruction from Planar Tagged Cardiac MR Images," *IEEE Workshop on Biomedical Image Analysis*, Seattle, June 1994.
28. T.S. Denney Jr., "Identification of Myocardial Tags in Tagged MR Images Without Prior Knowledge of Myocardial Contours," *XVth International Conference on Information Processing in Medical Imaging*, Poultney, Vermont, June 9-13, 1997.
29. L. Yan and T.S. Denney Jr., "2-D Motion Estimation of Left Ventricle from Tagged MR Images Using Edge-Preserving Regularization," *Proceedings of the 1998 IEEE Workshop on Biomedical Image Analysis*, June, 1998.

Conference Proceedings

30. T.S. Denney Jr. and M.E. Greene, "Modeling and Simulation of the Tether Dynamics Explorer (TDE) Series Tension Sensor," *The Twenty-Second Southeastern Symposium on System Theory, Cookeville Tennessee*, pp. 359-362, March 11-13, 1990.
31. Q.E. Dolecek, K. Moorjani, B.F. Kim, T.J. Tilley, and T.S. Denney Jr., "Personal Visualization System: Applications in Research and Engineering," *Visualization 1990 Conference*, Oct. 1990.
32. T.S. Denney Jr. and J.L. Prince, "On Optimal Brightness Functions for Optical Flow," *Proceedings of the 1992 Conference on Acoustics, Speech, and Signal Processing*, San Francisco, IEEE 92CH3103-9, pp. III-257-260, March 23-26, 1992.
33. T.S. Denney Jr. and J.L. Prince, "On Non-parametric Optimal Brightness Functions for Optical Flow," *Proceedings of the 1993 Conference on Information Sciences and Systems*, The Johns Hopkins University, March 24-26, 1993.
34. T.S. Denney Jr. and J.L. Prince, "Optimal Brightness Patterns for 2-D Optical Flow," *Proceedings of the 1993 Conference on Acoustics, Speech, and Signal Processing*, Minneapolis, April, 1993.

35. J.L. Prince, T.S. Denney Jr. and E.R. McVeigh, "Cardiac Motion Analysis Using MR Tagging and Optical Flow," *The Whitaker Foundation Biomedical Engineering Research Conference*, Snowbird, Utah, July 30 - August 1, 1993.
36. T.S. Denney Jr. and J.L. Prince, "A Frequency Domain Analysis of Optical Flow Performance," Abstract and Poster Session, *IEEE Eighth Workshop on Image and Multidimensional Signal Processing*, Cannes, France, September 8-10 1993.
37. T.S. Denney Jr. and J.L. Prince, "New Results on the Performance of Optical Flow for Deformable Motion," *Proceedings of the 1994 Conference on Information Sciences and Systems*, Princeton University, March 1994.
38. T.S. Denney Jr. and J.L. Prince, "3D Displacement Field Reconstruction on an Irregular Domain from Planar Tagged Cardiac MR Images," *Proceedings of the IEEE Workshop on Non-rigid and Articulate Motion*, Austin, TX, pp. 172-177, November, 1994.
39. T.S. Denney Jr., J.L. Prince, E.R. McVeigh, M.J. Lopez, "Optimal Tag Pattern Validation Using Magnetic Resonance Imaging," *Proceedings of the First IEEE International Conference on Image Processing*, Austin, TX, pp. 881-885, November, 1994.
40. T.S. Denney Jr., "On Estimating 3-D Incompressible Motion," *Proceedings of the Second IEEE International Conference on Image Processing*, Washington, DC, pp. 492-495, October, 1995.
41. T.S. Denney Jr., "Estimation of Left Ventricular Displacement from Magnetic Resonance Phase Contrast and Tagging Data," *Proceedings of the Ninth Image and Multidimensional Signal Processing Workshop*, Belize City, Belize, March 3-6, 1996.
42. T.S. Denney Jr. and E.R. McVeigh, "Model-Free Reconstruction of 3-D Myocardial Strain from Planar Tagged MR Images: Precision and Spatial Resolution," *Proceedings of the 16th Southern Biomedical Engineering Conference*, Biloxi, Mississippi, April 4-6, 1997.
43. T.S. Denney Jr., "Segmentation of Myocardial Magnetic Resonance (MR) Tags Without Prior Knowledge of Myocardial Contours," *Fifth Meeting of the International Society for Magnetic Resonance in Medicine*, Vancouver, Canada, April 12-18, 1997.
44. Warren, J.D., Denney, T.S., Jr., and Savrda, C.E., Application of a grayscale image analysis program in cyclostratigraphic studies of the Demopolis Chalk (Upper Cretaceous, Alabama): *GSA Annual Meeting Abstracts with Programs*, vol. 29, no. 6, p. A-413, 1997.
45. Warren, J.D., Denney, T.S., Jr., and Savrda, C.E., Digital image analysis as a tool for geochemical approximation and climatic interpretation: Upper Cretaceous (Campanian-Maastrichtian) Demopolis Chalk: *GSA 46th Annual Southeastern Section Abstracts with Programs*, vol. 29, no. 3, p. 77, 1997.
46. L. Yan and T.S. Denney Jr., "2-D Motion Estimation of Left Ventricle from Tagged MR Images Using Edge-Preserving Regularization," *Proceedings of the 1998 SPIE Medical Imaging Conference*.
47. T.D. Nguyen, S.J. Reeves, and T.S. Denney, Jr., "Optimal pulse shape for estimating positions of superimposed pulses," *Proceedings of the 1998 International Conference on Acoustics, Speech, and Signal Processing*, Seattle, WA, 1998.
48. L. Yan and T.S. Denney Jr., "Unsupervised Estimation of Left Ventricular Displacement from MR Tagged Images Using Markov Random Field Edge Priors," *Proceedings of the 1998 International Conference on Image Processing*, Chicago, IL, 1998.
49. T.D. Nguyen, S.J. Reeves, and T.S. Denney, Jr., "New magnetic resonance tagging technique for directly measuring the strain tensor of the in vivo human heart," *Proceedings of the 1998 International Conference on Image Processing*, Chicago, IL, 1998.

50. Z. Han and T.S. Denney Jr., "Interpolation of 2-D fractional Brownian motion using first order increments," *Proceedings of the 1998 International Conference on Image Processing*, Chicago, IL, 1998.
51. T.S. Denney, Jr., "Unsupervised Reconstruction of 3-D Left-Ventricular Strain from MRI data," *The Whitaker Foundation Biomedical Engineering Research Conference*, August 1998.
52. Moss, AG, Morgan, DD, and Denney, TS, "Harmonic analysis of ciliary motion with a confocal microscope," *HSEMB'99*.
53. Morrison, EE, Denney, TS, Vodyanoy, V, "Morphology, M physiology and image analysis of the peripheral canine olfactory system," *1999 ONDCP International Technology Symposium*.
54. J. Declerck, T.S. Denney Jr., W. O'Dell, C. Ozturk, E.R. McVeigh, "Left ventricular motion reconstruction from planar tagged MR images: a comparison," *1999 Meeting of the International Society of Magnetic Resonance in Medicine*.
55. T.S. Denney, Jr., "Unsupervised Reconstruction of 3-D Left-Ventricular Strain from MRI data," *The Whitaker Foundation Biomedical Engineering Research Conference*, August 1999.
56. T.S. Denney Jr and L. Yan, "Unsupervised reconstruction of left ventricular strain from planar tagged cardiac MR images," *Proceedings of the 8th Meeting of the International Society of Magnetic Resonance in Medicine*, Denver CO, USA, 2000.
57. T.S. Denney Jr, "Automated Tag Line Tracking In Tagged White Blood Images," *Proceedings of the 9th Meeting of the International Society of Magnetic Resonance in Medicine*, Glasgow, Scotland, 2001.
58. Walsh, E.G. Denney, T., Johnson, V.Y., Newcomer, B.R., "Imaging of Regional Muscle Strain and Displacement Using Force-Referenced RF Tagged MR Imaging," *Proceedings Of The 1st ESMRM/ISMRM Workshop On Non-Invasive Assessment Of Muscle Function*, Marseille, France. October, 2001.
59. T.S. Denney Jr., B.L. Gerber, and L. Yan, "Validation of Unsupervised Reconstruction of Left Ventricular Strain from Tagged MRI" *10th Meeting of the International Society for Magnetic Resonance in Medicine*, Honolulu, Hawaii, May 2002.
60. D. Xiang and T.S. Denney Jr, "3D Myocardial Strain Strain Reconstruction From Tagged MRI Using a Cylindrical B-spline Model," submitted to *IEEE International Symposium on Biomedical Imaging*, Washington, DC, July 2002.
61. T.S. Denney Jr. and S.J. Reeves, "MR spectroscopic image reconstruction using structural information from anatomical MR images," *Electronic Imaging 2003*, Santa Clara, CA, January, 2003.
62. T.S. Denney Jr and D. Xiang, "Rapid 3D LV Strain Reconstruction from Tagged Cardiac MR Images," *11th Meeting of the International Society for Magnetic Resonance in Medicine*, Toronto, Ontario, Canada, July 2003.
63. Deng, X and Denney Jr, TS, Optimizing Knot Positions for Multidimensional B-spline Models, *Proceedings of Electronic Imaging 2004, Computational Imaging II Conference*, San Jose, California, January 2004.
64. Deng, X and Denney Jr, TS, Combined Tag Tracking and Myocardium Motion Reconstruction from Planar Tagged MR Image Data Without User-Defined Myocardial Contours, *Proceedings of the 2004 International Symposium on Biomedical Imaging (ISBI'04)*, Washington, DC, April, 2004.

65. Morrison, EE, Wang, K, Dennis, JC, Josephson E., Denney Jr., TS, Vodyanoy, VJ, "Canine Olfaction: Structure and Function," *Olfactory Symposium*, Dstl, Ministry of Defense, Seven Oaks UK, 2004.
66. Bertus, M, Denney, T, Godbey, J and Hinkelmann, C, "Historical Speculative Bubbles: Evidence from the Futures Market," *Financial Management Association* Fall 2004.
67. Parmar, M, Reeves, SJ and Denney Jr., TS, Bayesian Edge-preserving Color Image Reconstruction from Color Filter Array Data, *Proceedings of Electronic Imaging 2005, Computational Imaging III Conference*, San Jose, California, January 2005.
68. Morrison, EE, Wang, K, Dennis, JC, Josephson E., Denney Jr., TS, Vodyanoy, VJ, "Canine Olfaction: Structure and Function," *International Seminar on Detection Dogs*, Kircadine Scotland 2005.
69. Bertus, M, Denney, T, Godbey, J and Hinkelmann, C, "Historical Speculative Bubbles: Evidence from the Futures Market," *Eastern Financial Association* Spring 2005.
70. Bertus, M, Denney, T, Godbey, J and Hinkelmann, C, "Noise, Bubbles and Equity Prices: Evidence from the Stock Index Futures Market," *Midwest Financial Association Annual Meeting*, Milwaukee, WI, March 2005. **Voted Most Outstanding Paper in Derivatives.**
71. J. Li and T.S. Denney Jr., "Evaluation of B-Spline Cardiac Deformation Models for Tagged MRI," *13th Meeting of the International Society for Magnetic Resonance in Medicine*, Miami, Florida, May 2005.
72. Wang, K, Denney Jr, TS, Vodyanoy, VJ, and Morrison, EE, "Construction of Volume Meshes from Computed Tomography Data," *27th IEEE EMBS Annual International Conference*, Shanghai, China September 2005.
73. Wang, K, Denney Jr, TS, Vodyanoy, VJ, and Morrison, EE, "Numerical Simulation of Air Flow in the Human Nasal Cavity," *27th IEEE EMBS Annual International Conference*, Shanghai, China September 2005.
74. Wang, K, Denney Jr, TS, Vodyanoy, VJ, and Morrison, EE, "Application Hierarchical Spline-Based Image Registration to Human Nasal Cavity Reconstruction" *2005 Annual Fall Meeting of the Biomedical Engineering*.
75. Li, J, Davis, C, and Denney Jr., TS, "Determining Tag Line Correspondences in Tagged Cardiac MR Images With Deterministic Annealing," *2006 International Symposium on Biomedical Imaging*, April 2006.
76. Davis, C, Li, J, and Denney Jr., TS, "Bandpass Filtering for Tracking Tag Lines in Tagged Cardiac MR Images," *2006 International Symposium on Biomedical Imaging*, April 2006.
77. Li, T and Denney Jr., TS, "Breath-Hold Image Misalignment Correction in Cardiac MRI Using Short-axis and Long-Axis LV Contour Information," *14th Meeting of the International Society for Magnetic Resonance in Medicine*, May 2006.
78. Morrison, EE, Dennis, J, Josephson, E, Denney Jr., TS, Wang, K, and Vodyanoy, V, "Canine Olfaction," *International Explosives Detection Canine Conference*, Las Vegas, Nov 2006.
79. Gupta, H, Denney Jr., T.S., Lloyd, S.G., Calhoun, D.A., Zoghbi, G.J., Corros, C., Nagaraj, H., Dell'Italia, L.J. , "Effects of loading conditions on the left ventricular mechanics," *Society for Cardiovascular Magnetic Resonance Tenth Annual Scientific Sessions*, Rome, Italy, Feb 2007.
80. Nagaraj, H, Denney Jr., T.S., Lloyd, S.G., Chichi Aban, Cecilia Corros, Louis J. Dell'italia, Gupta, H, "Does mitral regurgitation cause left ventricular dyssynchrony?," *Society for*

- Cardiovascular Magnetic Resonance Tenth Annual Scientific Sessions*, Rome, Italy, Feb 2007.
81. Ruzsics, B. Suranyi, P., Kiss, P., Denney, Jr., T.S., Litovsky, S.H., Brott, B.C. Simor, T. Lloyd, S.G., Elgavish, G.A., Gupta, H, "Complex MRI evaluation of porcine reperfused myocardial infarction using a multi-modality approach," *Society for Cardiovascular Magnetic Resonance Tenth Annual Scientific Sessions*, Rome, Italy, Feb 2007.
 82. Gupta, H., Denney Jr., T.S., Lloyd, S.G., Calhoun, D.A., Zoghbi, G.J., Corros, C., Nagaraj, H.M. Dell'Italia, L.J., "Effects of loading conditions on left ventricular mechanics," *Society for Cardiovascular Magnetic Resonance Tenth Annual Scientific Sessions*, Rome, Italy, Feb 2007.
 83. Corros, C., Gupta, H, Denney Jr. ,T.S., Dell'Italia, L.J., and Lloyd, S.G., "Comparison of methods of quantification of left atrial volumes by cardiovascular magnetic resonance," *Society for Cardiovascular Magnetic Resonance Tenth Annual Scientific Sessions*, Rome, Italy, Feb 2007.
 84. Nagaraj, H, Denney Jr., T.S., Lloyd, S.G., Aban, C, Corros, C, Dell'Italia, L.J., Gupta, H, "Does mitral regurgitation cause left ventricular dyssynchrony?" *American College of Cardiology 56th Annual Scientific Session*, March 2007.
 85. Nagaraj, H, Denney Jr., T.S., Lloyd, S.G., Aban, C, Corros, C, Dell'Italia, L.J., Gupta, H, "Effect of volume overload on left ventricular torsion and extracellular matrix." *American College of Cardiology 56th Annual Scientific Session*, March 2007.
 86. AR Dillon, DM Tillson, J Hathcock, T Denney, C Killingsworth, LJ Dell'Italia, "Cardiac remodeling and hypertrophy in experimental mitral valve disease," *2007 American College of Veterinary Internal Medicine Forum*, June 6-9, Seattle Washington.
 87. Parmar, M., Reeves, S.J., Denney Jr., T.S., "Bayesian restoration of color images using a non-homogenous cross-channel prior," *International Conference on Image Processing (ICIP) 2007*, San Antonio, Texas, September, 2007.
 88. Feng, W., Gupta, H., Lloyd, S., Dell'Italia, L., Denney Jr., T., "Myocardial Contour Propagation in Cine Cardiac MRI," *15th Meeting of the International Society for Magnetic Resonance in Medicine*, May 2007.
 89. Hosakote M Nagaraj, Thomas S Denney, Jr, Steven G Lloyd, David Calhoun, Inmaculada Aban, Cecilia Corros, Gilbert J Zoghbi, Gilbert J Perry, Louis J Dell'Italia, and Himanshu Gupta, "Effect of Volume Overload on Left Ventricular Torsion and Extra Cellular Matrix," Abstract 964, *American Heart Association Scientific Sessions 2007*, Circulation 116: II_190-c-191II.
 90. Gupta, H, Feng, W, Lloyd, SG, Sanagala, T, Dell'Italia, LJ, Denney Jr., TS, "Diastolic function evaluation using a novel method for quantification of cine myocardial deformation analysis (cMDA) based on non-rigid registration," *Society for Cardiovascular Magnetic Resonance*, Los Angeles, CA, Feb 2008.
 91. Ambale, B, Lloyd, SG, Denney Jr., TS, Dell'Italia, LJ, Benza, R, Gupta, H, "3D Right Ventricular Strain and Geometry in Pulmonary Hypertension and Normals," *16th Meeting of the International Society for Magnetic Resonance in Medicine*, May 2008.
 92. Ambale, B, Denney Jr., TS, Lloyd, SG, Dell'Italia, LJ, Gupta, H, "Measuring 3D left ventricular strain from unwrapped harmonic phase," *2008 International Symposium on Biomedical Imaging*, Paris, France, April 2008.

93. Feng, W, Denney Jr., TS, Lloyd, SG, Dell'Italia, LJ, Gupta, H, "Contour regularized left ventricular strain analysis from cine MRI," *2008 International Symposium on Biomedical Imaging*, Paris, France, April 2008.
94. Ahmed, MI, Gladden, JD, Litovsky, S, Inusah, S, Gupta, H, Lloyd, SG, Denney Jr, TS, McGiffin, D, Dell'Italia, LJ, "Chronic organic mitral regurgitation results in marked myofibrillar degeneration and oxidative stress with post-surgical left-ventricular impairment despite pre-surgical left-ventricular ejection fraction > 60%," *American Heart Association Scientific Sessions*, New Orleans, LA, November, 2008.
95. Amabale, B, Gupta, H, Lloyd, SG, Dell'Italia, LJ, and Denney Jr., TS, "Comparison of 2D and 3D torsion measured from tagged cardiac MRI," *17th Meeting of the International Society for Magnetic Resonance in Medicine*, May 2009.
96. Feng, W, Denney Jr., TS, Lloyd, SG, Dell'Italia, LJ, Gupta, H, "Polar-Regularized Left Ventricular Strain Analysis from Cine MRI Using Non-rigid Registration," *17th Meeting of the International Society for Magnetic Resonance in Medicine*, May 2009.

Theses

1. T.S. Denney Jr., "Stochastic Estimation of Deformable Motion from Magnetic Resonance Tagged Cardiac Images," Ph.D. Thesis, The Johns Hopkins University, Department of Electrical and Computer Engineering, August, 1994. **Thesis supervisor:** Jerry L. Prince.
2. T.S. Denney Jr., "A Continuous-Discrete Extended Kalman Filter for the Small Expendable-Tether Deployment System," M.S. Thesis, Auburn University, Electrical Engineering Department, August, 1990. **Thesis supervisor:** Michael E. Greene.

INVITED TALKS

1. "Optimal Brightness Functions for Optical Flow Estimation of Left Ventricular Motion," BEIP Seminar, National Institutes of Health, March 11, 1993.
2. "3-D Strain Reconstruction from Planar Tagged Cardiac MR Images," Division of Cardiovascular Disease Cardiology NMR Conference, University of Alabama at Birmingham, February 17, 1995.
3. "Model-free Reconstruction of Cardiac Strain: Spatial Resolution and Noise Immunity," Cardiac Magnetic Resonance Imaging Group Seminar, The Johns Hopkins University School of Medicine, August 7, 1996.
4. "Unsupervised Reconstruction of Left Ventricular Strain," Cardiac Magnetic Resonance Imaging Group Seminar, The Johns Hopkins University School of Medicine, July 30, 1998.
5. "Unsupervised Reconstruction of Left Ventricular Strain," Biomedical Engineering Seminar Series, University of Alabama at Birmingham, September 14, 1998.

FUNDING

1. National Institutes of Health (NIH) National Heart Lung and Blood Institute (NHLBI), P50-HL077100 (SCCOR), "Left Ventricular Remodeling in Heart Failure," 1/05-12/09, \$17,627,458 (Total Award), \$1,012,053 (AU CoE Subcontract). PI (of AU CoE Subcontract) Thomas S. Denney Jr., Ph.D. Role: Responsible for analyzing all cardiac magnetic resonance images (MRI) acquired during the project.
2. ONDCP – "Canine Olfactory System: Structure, Function and Detection of Illicit Substances," Edward E. Morrison (PI), 8/01-7/04, \$872,861. Role: Investigator responsible for olfactory

response modeling and performing computational fluid dynamic (CFD) simulations of air flow through canine nasal cavities.

3. FAA – “Structure and Function of the Canine Olfactory System and the Detection of Illicit Substances,” Edward E. Morrison (PI), 8/01-7/04, \$870,000. Role: Investigator responsible for olfactory response modeling and performing computational fluid dynamic (CFD) simulations of air flow through canine nasal cavities.
4. National Institutes of Health (NIH) National Heart Lung and Blood Institute (NHLBI), R01-HL61343, “Unsupervised Reconstruction of Left Ventricular Strain,” 7/99-6/04, \$610,000, PI Thomas S. Denney Jr., Ph.D.
5. Whitaker Foundation Transitional Funding Program - “Unsupervised Reconstruction of Left Ventricular Strain from MRI Data” 6/1/99-5/31/00, \$68,095, PI Thomas S. Denney Jr.
6. Whitaker Foundation - “Unsupervised Reconstruction of Left Ventricular Strain from MRI Data,” 6/1/96---5/31/99, \$210,000, PI: Thomas S. Denney Jr., Ph.D.
7. “Clinical Reconstruction of Cardiac Mechanical Function from Tagged Magnetic Resonance Image (MRI) Data,” SUN Microsystems, Inc., \$90,000 (equipment grant), Thomas S. Denney Jr. (PI).
8. Auburn University Research Grant-in-Aid - “Estimation of Strain from Magnetic Resonance Tagged Cardiac Images,” 4/15/95---9/15/96, \$2982, PI: Thomas S. Denney Jr., Ph.D.
9. Alabama Space Grant Consortium - “Modeling and simulation of a tethered satellite system,” 9/15/95---9/14/98, \$60,000, PI: Thomas S. Denney Jr., Ph.D.

TEACHING

Students Graduated

1. Zhaojin Han, (Ph.D., Electrical and Computer Engineering, 1999), “Modeling and Simulation of Random Vector Fields Based on Fractional Brownian Motion.” Currently with Oxford Instruments.
2. Nguyen Dang Thanh, (Ph.D., Electrical and Computer Engineering, 1999), Co-advisor: Stanley J. Reeves, Ph.D., “Optimal Acquisition of Magnetic Resonance Tagged Images for Heart Wall Motion Estimation.” Currently a research professor in magnetic resonance angiography with Cornell University.
3. Way Sun, (MS, Computer Science, 2000), “Motion Structure And Depth Estimation From Stereo Vision Without Correspondence.” Currently with Hitachi Inc.
4. Litao Yan, (Ph.D., Electrical and Computer Engineering, 2000), “Unsupervised Cardiac Motion Reconstruction from Tagged MR Images.” Currently with GE Medical Systems.
5. Kenneth Richard Hammett, (MS, Electrical and Computer Engineering, 2001), “Modeling and simulation of severed space tethers.” Currently with the National Institutes of Health.
6. Rajan Panchapeskan, (MS, Electrical and Computer Engineering, 2001), “Analysis of the Effect of Sniff Frequency on Canine Olfaction.” Currently with SUN Microsystems.
7. Jin Li, MS, (MS, Electrical and Computer Engineering, 2004), “Parallel Reconstruction Of Myocardial Strain From Tagged Cardiac MR Images.” Currently a Ph.D. student at Auburn University.
8. Deng Xiang, MS, (Ph.D., Electrical and Computer Engineering, 2004), “Fast three dimensional myocardial strain reconstruction from tagged MR images.” Currently at Siemens Corporate Technology, Center for Medical Imaging Validation in Beijing, China.

9. Kaustabh Kulkarni, (MEE, Electrical and Computer Engineering, 2004), "Semiautomatic Segmentation of M-Mode Cardiac Ultrasound. Currently with Siemens Corp in India.
10. Santosh Pandey (MS, Electrical and Computer Engineering, 2005), "Target Detection with Ultra-Wideband Radar." Currently a Ph.D. student at Auburn University.
11. Kezhou Wang, (PhD, Electrical and Computer Engineering 2006), "Numerical Modeling of Nasal Cavities and Air Flow Simulation." Currently a research professor at University of Illinois, Chicago.
12. Jin Li, (PhD, Electrical Engineering, 2006), "Tag Line Tracking and Cardiac Motion Modeling from Tagged MRI."
13. Craig Davis, (MS, Electrical and Computer Engineering, 2006), "Applications of Multi-Channel Filter Banks to Textured Image Segmentation."
14. Jiawei, Zhang, MEE, Electrical and Computer Engineering, December 2008.

Graduate Students

1. Wei Feng, (PhD candidate, Electrical and Computer Engineering)
2. Bharath Ambale, (PhD candidate Electrical and Computer Engineering)
3. Wei Zha, (PhD candidate Electrical and Computer Engineering)
4. Chun Guo , (PhD candidate, Electrical and Computer Engineering)
5. Sudarshan Ramenahalli, (MEE, Electrical and Computer Engineering)

Courses Developed

1. Introduction to Computed Imaging Systems (ELEC6810): Introduction to the physics, mathematics, and engineering principles involved in producing medical images such as magnetic resonance imaging (MRI) and computed tomography (CT).
2. Applied Image Processing (EE690): Basic image processing and computer vision techniques for quantitative analysis of scientific data. Project required.
3. Stochastic Estimation and Control (EE654): Design of controllers and state estimators when there are uncertainties in the process and/or measurements. Methods of modeling uncertainties are also discussed.

Courses Taught

1. Digital Signal Processing (ELEC6410): Digital processing of signals, sampling, difference equations, discrete time Fourier transforms, discrete and fast Fourier transforms, digital filter design.
2. Introduction to Electrical and Computer Engineering (ENGR1110): Freshmen level introduction to engineering design, engineering teams, graphical presentation, technical writing, oral presentation.
3. Probabilistic Methods for Electrical Engineers (EE311, ELEC3800): Introduction to probability, random variables, and random processes including analysis of random signals and noise and reliability of circuits and systems.

4. Signals and Systems I (EE314, ELEC2120): Introduction to continuous time system analysis, Fourier series, Fourier transform analysis, Laplace transform analysis.
5. Linear Feedback Systems (EE351): Analysis and design of continuous-time control systems. Transfer function analysis, PID control, root locus analysis and design, frequency response analysis and design.
6. Discrete and Nonlinear Control Systems (EE452): Analysis and design of discrete-time control systems with emphasis on digital control systems.
7. C++ Programming for Engineers (EE490): Introduction to object oriented programming techniques and the C++ programming language. Applications in numerical integration, electrical circuit modeling, solution of linear equations.
8. Computer Methods in Electrical Engineering (EE200): Introduction to computational techniques, such as high-level language programming, numerical integration, solution of linear systems of equations and the use of numerical software packages.