

JAMES E. FOWLER

Billie J. Ball Professor and Graduate Program Director
Department of Electrical and Computer Engineering
Mississippi State University

PERSONAL

Work:

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EDUCATION

Ph.D. in Electrical Engineering

The Ohio State University, Columbus, OH, August 1996
Thesis: "Adaptive Vector Quantization for the Coding of Nonstationary Sources"
Advisor: Dr. Stanley C. Ahalt
Major area: Communications and Signal Processing, Minor areas: Computer Architectures and Computer Graphics

M.S. in Electrical Engineering

The Ohio State University, Columbus, OH, June 1992
Thesis: "An Algorithm for Image Compression Using Differential Vector Quantization"
Advisor: Dr. Stanley C. Ahalt

B.S. in Computer and Information Science Engineering

The Ohio State University, Columbus, OH, March 1990; *summa cum laude*

PROFESSIONAL EXPERIENCE

Mississippi State University, Department of Electrical & Computer Engineering, Starkville, MS

Graduate Program Director — June 2008 to present
Billie J. Ball Endowed Professorship in Engineering — January 2011 to present
Professor — August 2007 to present
Associate professor — August 2002 to July 2007
Assistant professor — August 1997 to July 2002

Polytech'Nantes, Université de Nantes, Nantes, France

Visiting professor — June 2009

École Nationale Supérieure des Télécommunications, Département TSI, Paris, France

Visiting professor — May to December 2004

Université de Nice–Sophia Antipolis, Laboratoire I3S, Sophia Antipolis, France

Postdoctoral researcher — January to July 1997 and May to June 1998
Funded by an International Research Fellow Award from the National Science Foundation

The Ohio State University, Department of Electrical Engineering, Columbus, OH

Graduate research associate — September 1990 to August 1996

The Ohio State University, Department of Electrical Engineering, Columbus, OH

Instructor — spring quarter 1996

AT&T Bell Laboratories, Holmdel, NJ

Member of Technical Staff, Level 1, Visual Communications Department — June to August 1995

Ohio Department of Transportation, Columbus, OH

Computer programmer — April 1990 to August 1990

Intergraph Corporation, Huntsville, AL

Computer programmer — June 1988 to September 1988

Ohio Department of Transportation, Columbus, OH

Computer programmer and draftsman — June 1987 to September 1987

Intergraph Corporation, Huntsville, AL

Computer draftsman — June 1986 to September 1986 and June 1985 to September 1985

AREAS OF TEACHING AND RESEARCH SPECIALIZATION

- Communication of images, video, and terascale data
- Wavelets and multiwavelets
- Data-compression algorithms
- Video-coding algorithms and hardware systems
- Image processing and coding
- Communication systems and theory
- Information theory

GRANTS AND CONTRACTS

- Senior personnel, “Redundant Wavelet Transforms and Information Fusion for Robust Hyperspectral ATR,” National Geospatial Intelligence Agency (NGA) NURI, \$298,580, September 1, 2009–August 31, 2011 (with S. Prasad and L. M. Bruce).
- Principal investigator, “Compressive-Projection Principal Component Analysis,” National Science Foundation, Award No. CCF-0915307, \$423,119, July 15, 2009–June 30, 2012.
- Principal investigator, “Random Projections for Dimensionality Reduction of Hyperspectral Data,” National Geospatial Intelligence Agency (NGA) NURI Award No. HM1582-08-1-0014, \$300,000, August 16, 2008–September 30, 2011 (with Q. Du).
- Co-principal investigator, “Remote Visualization Using ParaView Enterprise Edition (PVEE),” DoD HPCMO PET initiative, \$150,114, June 2006–May 2007 (with R. Moorhead, PI).
- Co-principal investigator, “Integrated Management Systems for Invasive Aquatic Plants and Terrestrial Grasses,” US Geological Survey Biological Resources Discipline, \$893,000, August 9, 2005–September 30, 2007 (with J. D. Madsen, D. R. Shaw, J. D. Byrd, R. L. Brown, L. M. Bruce, E. R. Dibble, G. R. Ervin).
- Principal investigator, “Poste de Chercheur Associé,” CNRS, 17,038€, July–December 2004.
- Co-principal investigator, “Enabling Technologies for Exploiting EOS Data for Decision Support,” NASA, \$592,000, February 2001–February 2005 (with R. L. King, N. Younan, L. Bruce).
- Principal investigator, “Video Coding Using Multihypothesis Motion Compensation in the Redundant Wavelet Domain,” National Science Foundation, Award No. CCR-0310864, \$239,615, August 15, 2003–July 31, 2007.

- Principal investigator, “EVITA — A Prototype System for Efficient Visualization and Interrogation of Terascale Datasets,” National Science Foundation, Large Scientific and Software Data Set Visualization Program (LSSDSV) Award No. ACI-9982344, \$1,267,500, January 1, 2000–December 31, 2003 (with R. Machiraju, D. Thompson, B. Soni, and W. Schroeder).
- Principal investigator, “Wavelet Compression of 3D Grids,” Navy Research Laboratory-SSC, \$89,315, January 1, 2000—May 6, 2002.
- Co-principal investigator, “Integrated Systems and Remote Visualization,” Naval Oceanographic Office, \$1,097,079, September 24, 1999—December 31, 2001 (with R. Moorhead, PI).
- Co-principal investigator, “Generalized Wavelet Based Feature Detection for Computational Field Simulation,” \$115,484, MSU/NSF ERC, April 15, 1998–April 14, 1999 (with R. Machiraju, PI).
- Co-principal investigator, “Advanced Data and Image Visualization,” \$88,442, NASA Stennis Space Center, February 16, 1998–December 31, 1998 (with R. Moorhead, PI).
- Principal investigator, “Wavelet-Based Subband Coding for Video Using Adaptive Vector Quantization,” Mississippi State University Office of Research, 1998 Summer Research Program, \$1,444, May 15–June 14, 1998.
- Principal investigator, “Packet-Based Video On Demand Using Wavelet-Based Subband Coding and Adaptive Vector Quantization,” Mississippi State University Office of Research, 1998 Research Initiation Program Award, \$6,000, January 1, 1998–December 31, 1998.
- Principal investigator, “Wavelet-Based Subband Coding for Video Using Adaptive Vector Quantization,” National Science Foundation, NSF International Research Fellow Award No. INT-9600260, \$39,380, January 1, 1997–July 31, 1997 and May 15, 1998–June 15, 1998, postdoctoral research.

PUBLICATIONS

Book Chapters

- W. Zhu, Q. Du, and J. E. Fowler, “Hyperspectral Image Compression Using Segmented Principal Component Analysis,” in *Satellite Data Compression*, B. Huang, Ed., Springer, 2011, to appear.
- J. E. Fowler and Q. Du, “Reconstructions from Compressive Random Projections of Hyperspectral Imagery,” in *Optical Remote Sensing: Advances in Signal Processing and Exploitation Techniques*, S. Prasad, L. M. Bruce, and J. Chanussot, Eds., chapter 3, pp. 31-48, Springer, 2011.
- J. E. Fowler and J. T. Rucker, “3D Wavelet-Based Compression of Hyperspectral Imagery,” in *Hyperspectral Data Exploitation: Theory and Applications*, C.-I. Chang, Ed., chapter 14, pp. 379-407, John Wiley & Sons, Inc., Hoboken, NJ, 2007.
- R. Machiraju, J. E. Fowler, D. Thompson, B. Soni, and W. Schroeder, “EVITA - Efficient Visualization and Interrogation of Tera-Scale Datasets,” in *Data Mining for Scientific and Engineering Applications*, R. L. Grossman, C. Kamath, P. Kegelmeyer, V. Kumar, and R. R. Namburu, Eds., chapter 15, pp. 257-279, Kluwer Academic Publishers, Norwell, MA, 2001.

Refereed Journal Articles

- W. Li, S. Prasad, J. E. Fowler, and L. M. Bruce, “Locality-Preserving Dimensionality Reduction and Classification for Hyperspectral Image Analysis,” *IEEE Transactions on Geoscience and Remote Sensing*, to appear.
- J. E. Fowler and Q. Du, “Anomaly Detection and Reconstruction from Random Projections,” *IEEE Transactions on Image Processing*, to appear.
- W. Li, S. Prasad, J. E. Fowler, and L. M. Bruce, “Locality-Preserving Discriminant Analysis in Kernel-Induced Feature Space for Hyperspectral Classification,” *IEEE Geoscience and Remote Sensing Letters*, vol. 8, pp. 894-898, September 2011.
- W. Zhu, Q. Du, and J. E. Fowler, “Multi-Temporal Hyperspectral Image Compression,” *IEEE Geoscience and Remote Sensing Letters*, vol. 8, pp. 416-420, May 2011.
- Q. Du, W. Zhu, H. Yang, and J. E. Fowler, “Segmented Principal Component Analysis for Parallel Compression of Hyperspectral Imagery,” *IEEE Geoscience and Remote Sensing Letters*, vol. 6, pp. 713-717, October 2009.

- J. E. Fowler, "Compressive-Projection Principal Component Analysis," *IEEE Transactions on Image Processing*, vol. 18, pp. 2230-2242, October 2009.
- Q. Du, J. E. Fowler, and W. Zhu, "On the Impact of Atmospheric Correction on Lossy Compression of Multispectral and Hyperspectral Imagery," *IEEE Transactions on Geoscience and Remote Sensing*, vol. 47, pp. 130-132, January 2009.
- Q. Du and J. E. Fowler, "Low-Complexity Principal Component Analysis for Hyperspectral Image Compression," *International Journal of High Performance Computing Applications*, vol. 22, pp. 438-448, November 2008.
- J. Zhang, J. E. Fowler, and G. Liu, "Lossy-to-Lossless Compression of Hyperspectral Imagery Using Three-Dimensional TCE and an Integer KLT," *IEEE Geoscience and Remote Sensing Letters*, vol. 5, pp. 814-818, October 2008.
- Q. Du, W. Zhu, and J. E. Fowler, "Anomaly-Based JPEG2000 Compression of Hyperspectral Imagery," *IEEE Geoscience and Remote Sensing Letters*, vol. 5, pp. 696-700, October 2008.
- J. B. Boettcher and J. E. Fowler, "Video Coding Using a Complex Wavelet Transform and Set Partitioning," *IEEE Signal Processing Letters*, vol. 14, pp. 633-636, September 2007.
- G. Feideropoulou, M. Trocan, J. E. Fowler, B. Pesquet-Popescu, and J.-C. Belfiore, "Rotated Constellations for Video Transmission over Rayleigh Fading Channels," *IEEE Signal Processing Letters*, vol. 14, pp. 629-632, September 2007.
- Q. Du and J. E. Fowler, "Hyperspectral Image Compression Using JPEG2000 and Principal Component Analysis," *IEEE Geoscience and Remote Sensing Letters*, vol. 4, pp. 201-205, April 2007.
- J. E. Fowler and B. Pesquet-Popescu, "Wavelets in Source Coding, Communications, and Networks: An Overview," *EURASIP Journal on Image and Video Processing*, vol. 2007, Article ID 60539, 27 pages, 2007.
- J. E. Fowler, S. Cui, and Y. Wang, "Motion Compensation Via Redundant-Wavelet Multihypothesis," *IEEE Transactions on Image Processing*, vol. 15, pp. 3102-3113, October 2006.
- S. Cui, Y. Wang, and J. E. Fowler, "Motion Estimation and Compensation in the Redundant-Wavelet Domain Using Triangle Meshes," *Signal Processing: Image Communication*, vol. 21, pp. 586-598, August 2006.
- G. Feideropoulou, M. Trocan, J. E. Fowler, B. Pesquet-Popescu, and J.-C. Belfiore, "Joint Source-Channel with Partially Coded Index Assignment for Robust Scalable Video," *IEEE Signal Processing Letters*, vol. 13, pp. 201-204, April 2006.
- Y. Wang, S. Cui, and J. E. Fowler, "3D Video Coding with Redundant-Wavelet Multihypothesis," *IEEE Transactions on Circuits and Systems for Video Technology*, vol. 16, pp. 166-177, February 2006.
- J. E. Fowler, "The Redundant Discrete Wavelet Transform and Additive Noise," *IEEE Signal Processing Letters*, vol. 12, pp. 629-632, September 2005.
- L. Hua and J. E. Fowler, "Wavelet-Based Coding of Time-Varying Vector Fields of Ocean-Surface Winds," *IEEE Transactions on Geoscience and Remote Sensing*, vol. 42, pp. 1283-1290, June 2004.
- Y. Wang, J. T. Rucker, and J. E. Fowler, "3D Tarp Coding for the Compression of Hyperspectral Images," *IEEE Geoscience and Remote Sensing Letters*, vol. 1, pp. 136-140, April 2004.
- J. E. Fowler, "Embedded Wavelet-Based Image Compression: State of the Art (Eingebettete Wavelet-basierte Bildkompression: Stand der Technik)," *Information Technology*, vol. 25, pp. 256-262, September-October 2003.
- J. E. Fowler and L. Hua, "Wavelet Transforms for Vector Fields Using Omnidirectionally Balanced Multi-wavelets," *IEEE Transactions on Signal Processing*, vol. 50, pp. 3018-3027, December 2002.
- J. E. Fowler and D. N. Fox, "Embedded Wavelet-Based Coding of Three-Dimensional Oceanographic Images With Land Masses," *IEEE Transactions on Geoscience and Remote Sensing*, vol. 39, pp. 284-290, February 2001.
- J. E. Fowler, "Adaptive Vector Quantization for Efficient Zerotree-Based Coding of Video with Nonstationary Statistics," *IEEE Transactions on Circuits and Systems for Video Technology*, vol. 10, pp. 1478-1488, December 2000.
- J. E. Fowler, "Generalized Threshold Replenishment: An Adaptive Vector Quantization Algorithm for the Coding of Nonstationary Sources," *IEEE Transactions on Image Processing*, vol. 7, pp. 1410-1424, October 1998.

- J. E. Fowler, K. C. Adkins, S. B. Bibyk, and S. C. Ahalt, “Real-Time Video Compression Using Differential Vector Quantization,” *IEEE Transactions on Circuits and Systems for Video Technology*, vol. 5, pp. 14–24, February 1995.
- J. E. Fowler, M. R. Carbonara, and S. C. Ahalt, “Image Coding Using Differential Vector Quantization,” *IEEE Transactions on Circuits and Systems for Video Technology*, vol. 3, no. 5, pp. 350–367, October 1993.
- C. Mills, S. C. Ahalt, and J. Fowler, “Compiled Instruction Set Simulation,” *Software–Practice and Experience*, vol. 21, pp. 877–889, August 1991.

Refereed Conference Papers

- W. Li and J. E. Fowler, “Decoder-Side Dimensionality Determination for Compressive-Projection Principal Component Analysis of Hyperspectral Data,” in *Proceedings of the International Conference on Image Processing*, Brussels, Belgium, September 2011, pp. 329–332.
- J. E. Fowler, S. Mun, and E. W. Tramel, “Multiscale Block Compressed Sensing with Smoothed Projected Landweber Reconstruction,” in *Proceedings of the European Signal Processing Conference*, Barcelona, Spain, August 2011, pp. 564–568.
- W. Li, S. Prasad, J. E. Fowler, and L. M. Bruce, “Class Dependent Compressive-Projection Principal Component Analysis for Hyperspectral Image Reconstruction,” in *Proceedings of the Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing*, Lisbon, Portugal, June 2011, to appear.
- W. Li, S. Prasad, J. E. Fowler, and L. M. Bruce, “A Multi-Modal Pattern Classification Framework for Hyperspectral Image Analysis,” in *Proceedings of the Workshop on Hyperspectral Image and Signal Processing: Evolution in Remote Sensing*, Lisbon, Portugal, June 2011, to appear.
- E. W. Tramel and J. E. Fowler, “Video Compressed Sensing with Multihypothesis,” in *Proceedings of the IEEE Data Compression Conference*, J. A. Storer and M. W. Marcellin, Eds., Snowbird, UT, March 2011, pp. 193–202.
- S. Mun and J. E. Fowler, “Residual Reconstruction for Block-Based Compressed Sensing of Video,” in *Proceedings of the IEEE Data Compression Conference*, J. A. Storer and M. W. Marcellin, Eds., Snowbird, UT, March 2011, pp. 183–192.
- M. Trocan, T. Maugey, E. W. Tramel, J. E. Fowler, and B. Pesquet-Popescu, “Multistage Compressed-Sensing Reconstruction of Multiview Images,” in *Proceedings of the International Workshop on Multimedia Signal Processing*, Saint-Malo, France, October 2010, pp. 111–115.
- M. Trocan, T. Maugey, E. W. Tramel, J. E. Fowler, and B. Pesquet-Popescu, “Compressed Sensing of Multiview Images Using Disparity Compensation,” in *Proceedings of the International Conference on Image Processing*, Hong Kong, September 2010, pp. 3345–3348.
- M. Trocan, T. Maugey, J. E. Fowler, and B. Pesquet-Popescu, “Disparity-Compensated Compressed-Sensing Reconstruction for Multiview Images,” in *Proceedings of the IEEE International Conference on Multimedia and Expo*, Singapore, July 2010, pp. 1225–1229.
- S. Mun and J. E. Fowler, “Block Compressed Sensing of Images Using Directional Transforms,” in *Proceedings of the International Conference on Image Processing*, Cairo, Egypt, November 2009, pp. 3021–3024.
- M. Trocan, B. Pesquet-Popescu, J. E. Fowler, and C. Yaacoub, “Block-Based Graph-Cut Rate Allocation for Subband Image Compression and Transmission Over Wireless Networks,” in *Proceedings of the 5th International Mobile Multimedia Communications Conference*, London, UK, September 2009, pp. 1–6.
- J. E. Fowler, “Compressive-Projection Principal Component Analysis and the First Eigenvector,” in *Proceedings of the IEEE Data Compression Conference*, J. A. Storer and M. W. Marcellin, Eds., Snowbird, UT, March 2009, pp. 223–232.
- J. E. Fowler, “Compressive-Projection Principal Component Analysis for the Compression of Hyperspectral Signatures,” in *Proceedings of the IEEE Data Compression Conference*, J. A. Storer and M. W. Marcellin, Eds., Snowbird, UT, March 2008, pp. 83–92.
- Q. Du, W. Zhu, and J. E. Fowler, “Implementation of Low-Complexity Principal Component Analysis for Remotely Sensed Hyperspectral-Image Compression,” in *Proceedings of the IEEE Workshop on Signal Processing Systems*, Shanghai, China, October 2007, pp. 307–312.
- M. Trocan, B. Pesquet-Popescu, and J. E. Fowler, “Graph-Cut Rate Distortion Algorithm for Contourlet-Based Image Compression,” in *Proceedings of the International Conference on Image Processing*, San Antonio, TX, September 2007, vol. 3, pp. 169–172.

- J. E. Fowler, J. B. Boettcher, and B. Pesquet-Popescu, “Image Coding Using a Complex Dual-Tree Wavelet Transform,” in *Proceedings of the European Signal Processing Conference*, Poznań, Poland, September 2007.
- J. E. Fowler, M. Tagliasacchi, and B. Pesquet-Popescu, “Video Coding with Wavelet-Domain Conditional Replenishment and Unequal Error Protection,” in *Proceedings of the International Conference on Image Processing*, Atlanta, GA, October 2006, vol. 2, pp. 1869–1872.
- V. P. Shah, J. E. Fowler, and N. H. Younan, “Tarp Filtering of Block-Transform Coefficients for Embedded Image Coding,” in *Proceedings of the IEEE International Conference on Acoustics, Speech, and Signal Processing*, Toulouse, France, May 2006, vol. 2, pp. 21–24.
- J. E. Fowler, “Analysis of Redundant-Wavelet Multihypothesis for Motion Compensation,” in *Proceedings of the IEEE Data Compression Conference*, J. A. Storer and M. Cohn, Eds., Snowbird, UT, March 2006, pp. 352–361.
- G. Feideropoulou, J. E. Fowler, B. Pesquet-Popescu, and J.-C. Belfiore, “Joint Source-Channel Coding of Scalable Video with Partially Coded Index Assignment Using Reed-Muller Codes,” in *Proceedings of the International Conference on Image Processing*, Genoa, Italy, September 2005, vol. 3, pp. 888–891.
- J. B. Boettcher and J. E. Fowler, “Video Coding with MC-EZBC and Redundant-Wavelet Multihypothesis,” in *Proceedings of the International Conference on Image Processing*, Genoa, Italy, September 2005, vol. 3, pp. 229–232.
- K. M. Bradley and J. E. Fowler, “Redundant-Wavelet Watermarking with Pixel-Wise Masking,” in *Proceedings of the International Conference on Image Processing*, Genoa, Italy, September 2005, vol. 1, pp. 685–688.
- J. E. Fowler, M. Tagliasacchi, and B. Pesquet-Popescu, “Wavelet-Based Distributed Source Coding of Video,” in *Proceedings of the European Signal Processing Conference*, Antalya, Turkey, September 2005.
- J. E. Fowler, “Shape-Adaptive Coding Using Binary Set Splitting with k -d Trees,” in *Proceedings of the International Conference on Image Processing*, Singapore, October 2004, vol. 2, pp. 1301–1304.
- J. E. Fowler, “Shape-Adaptive Tarp Coding,” in *Proceedings of the International Conference on Image Processing*, Barcelona, Spain, September 2003, vol. 1, pp. 621–624.
- S. Cui, Y. Wang, and J. E. Fowler, “Multihypothesis Motion Compensation in the Redundant Wavelet Domain,” in *Proceedings of the International Conference on Image Processing*, Barcelona, Spain, September 2003, vol. 2, pp. 53–56.
- Y. Wang, S. Cui, and J. E. Fowler, “Fully Scalable Video Coding Using Redundant-Wavelet Multihypothesis and Motion-Compensated Temporal Filtering,” in *Proceedings of the International Conference on Image Processing*, Barcelona, Spain, September 2003, vol. 2, pp. 755–758.
- M. Marka and J. E. Fowler, “Unequal Error Protection of Embedded Multimedia Objects for Packet-Erasable Channels,” in *Proceedings of the International Workshop on Multimedia Signal Processing*, St. Thomas, US Virgin Islands, December 2002, pp. 61–64.
- S. Cui, Y. Wang, and J. E. Fowler, “Mesh-Based Motion Estimation and Compensation in the Wavelet Domain Using a Redundant Transform,” in *Proceedings of the International Conference on Image Processing*, Rochester, NY, September 2002, vol. 1, pp. 693–696.
- L. Hua and J. E. Fowler, “A Performance Analysis of Spread-Spectrum Watermarking Based on Redundant Transforms,” in *Proceedings of the IEEE International Conference on Multimedia and Expo*, Lausanne, Switzerland, August 2002, vol. 2, pp. 553–556.
- J. E. Fowler and Y. Wang, “Joint Embedded Coding of Data and Grid Using First-Generation Wavelet Transforms,” in *Proceedings of the IEEE Data Compression Conference*, J. A. Storer and M. Cohn, Eds., Snowbird, UT, April 2002, pp. 432–441.
- J. E. Fowler and L. Hua, “Omnidirectionally Balanced Multiwavelets for Vector Wavelet Transforms,” in *Proceedings of the IEEE Data Compression Conference*, J. A. Storer and M. Cohn, Eds., Snowbird, UT, April 2002, pp. 422–431.
- J.-G. Cao, J. E. Fowler, and N. H. Younan, “An Image-Adaptive Watermark Based on a Redundant Wavelet Transform,” in *Proceedings of the International Conference on Image Processing*, Thessaloniki, Greece, October 2001, pp. 277–280.
- J. E. Fowler and D. N. Fox, “Wavelet-Based Coding of Three-Dimensional Oceanographic Images Around Land Masses,” in *Proceedings of the International Conference on Image Processing*, Vancouver, Canada, September 2000, pp. 431–434.

- J. E. Fowler, "Video Coding Using Perceptually Weighted Vector Zerotrees and Adaptive Vector Quantization," in *Proceedings of the International Conference on Image Processing*, Chicago, IL, October 1998, pp. 117–121.
- J. E. Fowler and S. C. Ahalt, "Adaptive Vector Quantization Using Generalized Threshold Replenishment," in *Proceedings of the IEEE Data Compression Conference*, J. A. Storer and M. Cohn, Eds., Snowbird, UT, March 1997, pp. 317–326.
- J. E. Fowler and S. C. Ahalt, "Adaptive Vector Quantization of Image Sequences Using Generalized Threshold Replenishment," in *Proceedings of the International Conference on Acoustics, Speech, and Signal Processing*, Munich, Germany, April 1997, pp. 3085–3088.
- J. E. Fowler and R. Yagel, "Lossless Compression of Volume Data," in *Proceedings of the 1994 Symposium on Volume Visualization*, Washington, DC, October 1994, pp. 43–53.
- J. E. Fowler, K. C. Adkins, S. B. Bibyk, and S. C. Ahalt, "Differential Vector Quantization of Real-Time Video Using Entropy-biased ANN Codebooks," in *Proceedings of the IEEE International Conference on Neural Networks*, Orlando, FL, June 1994, pp. 1871–1876.
- J. E. Fowler and S. C. Ahalt, "Differential Vector Quantization of Real-Time Video," in *Proceedings of the IEEE Data Compression Conference*, J. A. Storer and M. Cohn, Eds., Snowbird, UT, March 1994, pp. 205–214.
- J. E. Fowler and S. C. Ahalt, "Robust, Variable Bit-rate Coding Using Entropy-biased Codebooks," in *Proceedings of the IEEE Data Compression Conference*, J. A. Storer and M. Cohn, Eds., Snowbird, UT, March 1993, pp. 361–370.

Other Conference Papers

- C. Chen, E. W. Tramel, and J. E. Fowler, "Compressed-Sensing Recovery of Images and Video Using Multi-hypothesis Predictions," in *Proceedings of the 45th Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, CA, November 2011, to appear.
- Q. Du, J. E. Fowler, and B. Ma, "Random-Projection-based Dimensionality Reduction and Decision Fusion for Hyperspectral Target Detection," in *Proceedings of the International Geoscience and Remote Sensing Symposium*, Vancouver, Canada, July 2011, to appear.
- Q. Du and J. E. Fowler, "On the Performance of Random-Projection-Based Dimensionality Reduction for Endmember Extraction," in *Proceedings of the International Geoscience and Remote Sensing Symposium*, Honolulu, HI, July 2010, pp. 1277–1280.
- S. Mun and J. E. Fowler, "Block Compressed Sensing of Images Using Directional Transforms," in *Proceedings of the IEEE Data Compression Conference*, J. A. Storer and M. W. Marcellin, Eds., Snowbird, UT, March 2010, p. 547.
- W. Zhu, Q. Du, and J. E. Fowler, "Segmented Principal Component Analysis for Hyperspectral Image Compression," in *Satellite Data Compression, Communications, and Processing V*, B. Huang, A. J. Plaza, R. Vitulli, Eds., Boston, MA, Proc. SPIE 7455, August 2009, pp. 74550I.
- J. E. Fowler, Q. Du, W. Zhu, and N. H. Younan, "Classification Performance of Random-Projection-Based Dimensionality Reduction of Hyperspectral Imagery," in *Proceedings of the International Geoscience and Remote Sensing Symposium*, Capetown, South Africa, July 2009, vol. 5, pp. 76–79.
- J. Zhang, J. E. Fowler, N. H. Younan, and G. Liu, "Evaluation of JP3D for Lossy and Lossless Compression of Hyperspectral Imagery," in *Proceedings of the International Geoscience and Remote Sensing Symposium*, Capetown, South Africa, July 2009, vol. 4, pp. 474–477.
- H. Yang, Q. Du, W. Zhu, I. Banicescu, and J. E. Fowler, "Parallel Data Compression for Hyperspectral Imagery," in *Proceedings of the International Geoscience and Remote Sensing Symposium*, Boston, MA, July 2008, vol. 2, pp. 986–989.
- Q. Du, W. Zhu, and J. E. Fowler, "Anomaly-Based Hyperspectral Image Compression," in *Proceedings of the International Geoscience and Remote Sensing Symposium*, Boston, MA, July 2008, vol. 2, pp. 974–977.
- J. Zhang, J. E. Fowler, Q. Du, and G. Liu, "Improvements to 3D-Tarp Coding for the Compression of Hyperspectral Imagery," in *Proceedings of the International Geoscience and Remote Sensing Symposium*, Boston, MA, July 2008, pp. 982–985.

- H. Tamhankar and J. E. Fowler, “Spectral-Decorrelation Strategies for the Compression of Hyperspectral Imagery,” in *Proceedings of the International Geoscience and Remote Sensing Symposium*, Barcelona, Spain, July 2007, pp. 1041–1044.
- J. B. Boettcher, Q. Du, and J. E. Fowler, “Hyperspectral Image Compression with the 3D Dual-Tree Wavelet Transform,” in *Proceedings of the International Geoscience and Remote Sensing Symposium*, Barcelona, Spain, July 2007, pp. 1033–1036.
- R. J. Vickery, A. Cedilnik, J. Martin, J. E. Fowler, R. Moorhead, Y. Dandass, T. Atkison, P. Adams, and J. Clarke, “Web-Based High Performance Remote Visualization,” in *Proceedings of the HPCMP Users Group Conference*, Pittsburgh, PA, June 2007.
- J. B. Boettcher and J. E. Fowler, “A Modified BISK Algorithm for 3D Dual-Tree Wavelet Transform Coding,” in *Proceedings of the IEEE Data Compression Conference*, J. A. Storer and M. W. Marcellin, Eds., Snowbird, UT, March 2007, p. 377.
- J. T. Rucker and J. E. Fowler, “Shape-Adaptive Embedded Coding of Ocean-Temperature Imagery,” in *Proceedings of the 40th Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, CA, October 2006, pp. 1887–1891.
- S. Cui, Y. Wang, and J. E. Fowler, “Combining Phase-Diversity with Spatial-Diversity Multihypothesis Motion Compensation,” in *Proceedings of the Midwest Symposium on Circuits and Systems*, Cincinnati, OH, August 2005, vol. 2, pp. 1545–1548.
- J. T. Rucker, J. E. Fowler, and N. H. Younan, “JPEG2000 Encoding Strategies for Hyperspectral Data,” in *Proceedings of the International Geoscience and Remote Sensing Symposium*, Seoul, Korea, July 2005, vol. 1, pp. 128–131.
- J. T. Rucker and J. E. Fowler, “Coding of Ocean-Temperature Volumes Using Binary Set Splitting with k -d Trees,” in *Proceedings of the International Geoscience and Remote Sensing Symposium*, Anchorage, AK, September 2004, vol. 1, pp. 289–292.
- S. B. Ziegeler, H. Tamhankar, J. E. Fowler, and L. M. Bruce, “Wavelet-Based Watermarking of Remotely Sensed Imagery Tailored to Classification Performance,” in *Proceedings of the IEEE Workshop on Advances in Techniques for Analysis of Remotely Sensed Data*, Washington, DC, October 2003, pp. 259–263.
- Y. Wang, J. T. Rucker, and J. E. Fowler, “Embedded Wavelet-Based Compression of Hyperspectral Imagery Using Tarp Coding,” in *Proceedings of the International Geoscience and Remote Sensing Symposium*, Toulouse, France, July 2003, vol. 3, pp. 2027–2029.
- T. Chu, J. E. Fowler, and R. J. Moorhead, “Evaluation and Extension of SGI Vizserver,” in *Visualization of Temporal and Spatial Data for Civilian and Defense Applications III*, G. O. Allgood and N. L. Faust, Eds., Orlando, FL, Proc. SPIE 4368, April 2001, pp. 63–73.
- J. E. Fowler, “QccPack: An Open-Source Software Library for Quantization, Compression, and Coding,” in *Applications of Digital Image Processing XXIII*, A. G. Tescher, Ed., San Diego, CA, Proc. SPIE 4115, August 2000, pp. 294–301.
- J. E. Fowler, “QccPack: An Open-Source Software Library for Quantization, Compression, and Coding,” in *Proceedings of the IEEE Data Compression Conference*, J. A. Storer and M. Cohn, Eds., Snowbird, UT, March 2000, p. 554.
- J. E. Fowler, “Video Coding Using Vector Zerotrees and Adaptive Vector Quantization,” in *Proceedings of the IEEE Data Compression Conference*, J. A. Storer and M. Cohn, Eds., Snowbird, UT, March 1998, p. 548.
- J. E. Fowler and S. C. Ahalt, “Image-Sequence Coding with Generalized Threshold Replenishment - A New Algorithm For Adaptive Vector Quantization,” in *Visual Information Processing VI*, S. K. Park and R. D. Juday, Eds., Orlando, FL, Proc. SPIE 3074, April 1997, pp. 64–71.
- J. E. Fowler, “Adaptive Vector Quantization—Part I: A Unifying Structure,” in *Proceedings of the IEEE Data Compression Conference*, J. A. Storer and M. Cohn, Eds., Snowbird, UT, March 1997, p. 437.
- J. E. Fowler, “Adaptive Vector Quantization—Part II: Classification and Comparison of Algorithms,” in *Proceedings of the IEEE Data Compression Conference*, J. A. Storer and M. Cohn, Eds., Snowbird, UT, March 1997, p. 438.
- A. S. Galanopoulos, J. E. Fowler, and S. C. Ahalt, “Vector Quantization using Artificial Neural Network Models,” in *Proceedings of the 7th Tyrrhenian International Workshop on Digital Communications*, E. Biglieri and M. Luise, Eds., Viareggio, Italy, 1995, pp. 346–357.

- J. E. Fowler and R. Yagel, “Optimal Linear Prediction for the Lossless Compression of Volume Data,” in *Proceedings of the IEEE Data Compression Conference*, J. A. Storer and M. Cohn, Eds., Snowbird, UT, March 1995, p. 458.
- S. C. Ahalt and J. E. Fowler, “Real-time Video Compression Using Entropy-biased ANN Codebooks,” in *Applications of Artificial Neural Networks V*, S. K. Rogers, Ed., Proc. SPIE 2243, April 1994, pp. 254–265.
- S. C. Ahalt and J. E. Fowler, “Vector Quantization using Artificial Neural Network Models,” in *Proceedings of the International Workshop on Adaptive Methods and Emergent Techniques for Signal Processing and Communications*, D. Docampo and A. R. Figueras, Eds., Bayona, Spain, June 1993, pp. 42–61.
- J. E. Fowler and S. C. Ahalt, “Robust, High-fidelity Coding Technique Based on Entropy-biased ANN Codebooks,” in *Science of Artificial Neural Networks II*, D. W. Ruck, Ed., Proc. SPIE 1966, April 1993, pp. 108–117.
- M. R. Carbonara, J. E. Fowler, and S. C. Ahalt, “Compression of Digital Video Data Using Artificial Neural Network Differential Vector Quantization,” in *Applications of Artificial Neural Networks III*, S. K. Rogers, Ed., Proc. SPIE 1709, April 1992, pp. 422–433.

Technical Reports

- J. E. Fowler, “An Implementation of PRISM Using QccPack,” Tech. Rep. MSSU-COE-ERC-05-01, Mississippi State ERC, Mississippi State University, January 2005.
- J. E. Fowler, “The Redundant Discrete Wavelet Transform and Additive Noise,” Tech. Rep. MSSU-COE-ERC-04-04, Mississippi State ERC, Mississippi State University, March 2004.
- L. Hua and J. E. Fowler, “Technical Details on a Family of Omnidirectionally Balanced Symmetric-Antisymmetric Multiwavelets,” Tech. Rep. MSSU-COE-ERC-02-08, Engineering Research Center, Mississippi State University, May 2002.
- M. Marka and J. E. Fowler, “Object-Based Unequal Error Protection,” Tech. Rep. MSSU-COE-ERC-02-01, Engineering Research Center, Mississippi State University, February 2002.
- L. Hua and J. E. Fowler, “Image Watermarking and the Redundant Wavelet Transform,” Tech. Rep. MSSU-COE-ERC-01-18, Engineering Research Center, Mississippi State University, December 2001.
- R. Machiraju, J. E. Fowler, D. Thompson, W. Schroeder, and B. Soni, “EVITA: A Prototype System for Efficient Visualization and Interrogation of Terascale Datasets,” Tech. Rep. MSSU-COE-ERC-01-02, Engineering Research Center, Mississippi State University, November 2000.
- J. E. Fowler, “Evaluation of SGI Vizserver,” Tech. Rep. MSSU-COE-ERC-01-01, Engineering Research Center, Mississippi State University, March 2000.
- J. E. Fowler, J. van der Zwaag, S. Tenginakai, R. Machiraju, and R. J. Moorhead, “Decoding of Large Terrains Using a Hardware Rendering Pipeline,” Tech. Rep. MSSU-COE-ERC-00-13, Engineering Research Center, Mississippi State University, 2000.
- J. E. Fowler, “A Survey of Adaptive Vector Quantization—Part I: A Unifying Structure,” SPANN Laboratory Technical Report TR-97-01, The Ohio State University, March 1997.
- J. E. Fowler and S. C. Ahalt, “A Survey of Adaptive Vector Quantization—Part II: Classification and Comparison of Algorithms,” SPANN Laboratory Technical Report TR-97-02, The Ohio State University, March 1997.
- J. E. Fowler, “Adaptive Vector Quantization for the Coding of Nonstationary Sources,” SPANN Laboratory Technical Report TR-95-05, The Ohio State University, April 1995.
- J. E. Fowler and R. Yagel, “Optimal Linear Prediction for the Lossless Compression of Volume Data,” SPANN Laboratory Technical Report TR-95-03, The Ohio State University, March 1995.
- J. E. Fowler, M. R. Carbonara, and S. C. Ahalt, “Design of a Real-Time Video Compression System Using Differential Vector Quantization,” SPANN Laboratory Technical Report TR-93-06, The Ohio State University, December 1993.
- J. E. Fowler, M. R. Carbonara, and S. C. Ahalt, “Differential Vector Quantization for Video Compression Using Artificial Neural Network Codebook Design,” SPANN Laboratory Technical Report TR-92-05, The Ohio State University, September 1992.

Other Publications

- J. E. Fowler, “Mathematics of digital images: Creation, compression, restoration, recognition (S. G. Hoggar),” *IEEE Signal Processing Magazine*, vol. 25, no. 4, pp. 128-129, July 2008, book review.
- J. E. Fowler, “Avoiding Plagiarism: A Student Survival Guide,” Mississippi State University, November 1998.

CREATIVE WORKS

Software

- *QccPack—Quantization, Compression, and Coding Library*
Open-source collection of library routines and utility programs for quantization, compression, and coding; over 55,000 lines of C code implementing over 500 library routines; under development since January 1997, <http://qccpack.sourceforge.net>
- *EVITA—Efficient Visualization and Interrogation of Terascale Datasets*
Open-source system to facilitate exploration of terascale datasets by using a wavelet-based representational scheme allowing ranked access to macroscopic data features; under development since January 2000, <http://evita.sourceforge.net>

PLENARY PRESENTATIONS AT PROFESSIONAL MEETINGS

- “Block-Based Compressed Sensing of Images and Video,” *IEEE Data Compression Conference*, Snowbird, UT, March 24, 2010.

PRESENTATIONS AT PROFESSIONAL MEETINGS

- “Multistage Compressed-Sensing Reconstruction of Multiview Images,” oral presentation, *International Workshop on Multimedia Signal Processing*, Saint-Malo, France, October 4, 2010.
- “Compressed Sensing of Multiview Images Using Disparity Compensation,” oral presentation, *International Conference on Image Processing*, Hong Kong, September 29, 2010.
- “Random Projections for Dimensionality Reduction of Hyperspectral Data,” oral presentation, *2010 NGA Academic Research Program (NARP) Symposium and Workshops*, Washington, DC, September 14, 2010.
- “Block Compressed Sensing of Images Using Directional Transforms,” poster presentation, *IEEE Data Compression Conference*, Snowbird, UT, March 25, 2010.
- “Block Compressed Sensing of Images Using Directional Transforms,” oral presentation, *International Conference on Image Processing*, Cairo, Egypt, November 10, 2009.
- “Random Projections for Dimensionality Reduction of Hyperspectral Data,” oral presentation, *2009 NGA Academic Research Program (NARP) Symposium and Workshops*, Washington, DC, September 29, 2009.
- “Compressive-Projection Principal Component Analysis and the First Eigenvector,” oral presentation, *IEEE Data Compression Conference*, Snowbird, UT, March 17, 2009.
- “Compressive-Projection Principal Component Analysis for the Compression of Hyperspectral Signatures,” oral presentation, *IEEE Data Compression Conference*, Snowbird, UT, March 25, 2008.
- “Graph-Cut Rate Distortion Algorithm for Contourlet-Based Image Compression,” oral presentation, *International Conference on Image Processing*, San Antonio, TX, September 18, 2007.
- “Hyperspectral Image Compression with the 3D Dual-Tree Wavelet Transform,” oral presentation, *International Geoscience and Remote Sensing Symposium*, Barcelona, Spain, July 24, 2007.
- “Spectral-Decorrelation Strategies for the Compression of Hyperspectral Imagery,” oral presentation, *International Geoscience and Remote Sensing Symposium*, Barcelona, Spain, July 24, 2007.
- “A Modified BISK Algorithm for 3D Dual-Tree Wavelet Transform Coding,” poster presentation, *IEEE Data Compression Conference*, Snowbird, UT, March 28, 2007.
- “Shape-Adaptive Embedded Coding of Ocean-Temperature Imagery,” oral presentation, *40th Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, CA, November 1, 2006.

- “Video Coding with Wavelet-Domain Conditional Replenishment and Unequal Error Protection,” poster presentation, *International Conference on Image Processing*, Atlanta, GA, October 10, 2006.
- “Tarp Filtering of Block-Transform Coefficients for Embedded Image Coding,” oral presentation, *IEEE International Conference on Acoustics, Speech, and Signal Processing*, Toulouse, France, May 16, 2006.
- “Analysis of Redundant-Wavelet Multihypothesis for Motion Compensation,” oral presentation, *IEEE Data Compression Conference*, Snowbird, UT, March 30, 2006.
- “Joint Source-Channel Coding of Scalable Video with Partially Coded Index Assignment Using Reed-Muller Codes,” poster presentation, *International Conference on Image Processing*, Genoa, Italy, September 14, 2005.
- “Shape-Adaptive Coding Using Binary Set Splitting with k -d Trees,” oral presentation, *International Conference on Image Processing*, Singapore, October 26, 2004.
- “Shape-Adaptive Tarp Coding,” oral presentation, *International Conference on Image Processing*, Barcelona, Spain, September 15, 2003.
- “Multihypothesis Motion Compensation in the Redundant Wavelet Domain,” oral presentation, *International Conference on Image Processing*, Barcelona, Spain, September 16, 2003.
- “Fully Scalable Video Coding Using Redundant-Wavelet Multihypothesis and Motion-Compensated Temporal Filtering,” poster presentation, *International Conference on Image Processing*, Barcelona, Spain, September 16, 2003.
- “Embedded Wavelet-Based Compression of Hyperspectral Imagery Using Tarp Coding,” oral presentation, *International Geoscience and Remote Sensing Symposium*, Toulouse, France, July 25, 2003.
- “Unequal Error Protection of Embedded Multimedia Objects for Packet-Erasure Channels,” poster presentation, *International Workshop on Multimedia Signal Processing*, St. Thomas, US Virgin Islands, December 10, 2002.
- “Mesh-Based Motion Estimation and Compensation in the Wavelet Domain Using a Redundant Transform,” poster presentation, *International Conference on Image Processing*, Rochester, NY, September 23, 2002.
- “A Performance Analysis of Spread-Spectrum Watermarking Based on Redundant Transforms,” oral presentation, *IEEE International Conference on Multimedia and Expo*, Lausanne, Switzerland, August 29, 2002.
- “An Image-Adaptive Watermark Based on a Redundant Wavelet Transform,” poster presentation, *International Conference on Image Processing*, Thessaloniki, Greece, October 9, 2001.
- “Evaluation and Extension of SGI Vizserver,” oral presentation, *Visualization of Temporal and Spatial Data for Civilian and Defense Applications III*, SPIE Aerosense, Orlando, FL, April 16, 2001.
- “Wavelet-Based Coding of Three-Dimensional Oceanographic Images Around Land Masses,” poster presentation, *International Conference on Image Processing*, Vancouver, Canada, September 12, 2000.
- “QccPack: An Open-Source Software Library for Quantization, Compression, and Coding,” oral presentation, *Applications of Digital Image Processing XXII*, SPIE Annual Meeting, San Diego, CA, August 1, 2000.
- “QccPack: An Open-Source Software Library for Quantization, Compression, and Coding,” poster presentation, *IEEE Data Compression Conference*, Snowbird, UT, March 29, 2000.
- “Video Coding Using Perceptually Weighted Vector Zerotrees and Adaptive Vector Quantization,” oral presentation, *International Conference on Image Processing*, Chicago, IL, October 5, 1998.
- “Video Coding Using Vector Zerotrees and Adaptive Vector Quantization,” poster presentation, *IEEE Data Compression Conference*, Snowbird, UT, March 31, 1998.
- “Adaptive Vector Quantization Using Generalized Threshold Replenishment,” oral presentation, *IEEE Data Compression Conference*, Snowbird, UT, March 27, 1997.
- “Adaptive Vector Quantization—Part I: A Unifying Structure,” poster presentation, *IEEE Data Compression Conference*, Snowbird, UT, March 26, 1997.
- “Adaptive Vector Quantization—Part II: Classification and Comparison of Algorithms,” poster presentation, *IEEE Data Compression Conference*, Snowbird, UT, March 26, 1997.

- “Adaptive Vector Quantization of Image Sequences Using Generalized Threshold Replenishment,” poster presentation, *International Conference on Acoustics, Speech, and Signal Processing*, Munich, Germany, April 24, 1997.
- “Optimal Linear Prediction for the Lossless Compression of Volume Data,” poster presentation, *IEEE Data Compression Conference*, Snowbird, UT, March 29, 1995.
- “Differential Vector Quantization of Real-Time Video,” oral presentation, *IEEE Data Compression Conference*, Snowbird, UT, March 30, 1994.
- “Lossless Compression of Volume Data,” oral presentation, *Symposium on Volume Visualization*, Washington, DC, October 17, 1994.
- “Variable Bit-rate Coding Using Entropy-biased ANN Codebooks,” poster presentation, *NASA Space Communications Symposium*, Cleveland, OH, October 1992.

INVITED LECTURES

- “Block Compressed Sensing for Images and Video” invited lecture, Prairie View A&M University, Prairie View, TX, September 11, 2009.
- “Block Compressed Sensing for Images and Video” invited lecture, École Nationale Supérieure des Télécommunications–Paris, Paris, France, July 8, 2009.
- “Block Compressed Sensing for Images and Video” invited lecture, Université de Nantes, Nantes, France, June 16, 2009.
- “Random Projections for Dimensionality Reduction of Hyperspectral Data,” invited lecture, Université de Nantes, Nantes, France, November 6, 2008.
- “Random Projections for Dimensionality Reduction of Hyperspectral Data,” invited lecture, Scientific Computing Research Group, Bagley College of Engineering, Mississippi State University, September 4, 2008.
- “Image and Video Coding Using Complex Dual-Tree Wavelet Transforms,” invited lecture, École Nationale Supérieure des Télécommunications–Paris, Paris, France, February 21, 2008.
- “A Compressed-Sensing Approach to Principal Component Analysis,” invited lecture, École Nationale Supérieure des Télécommunications–Paris, Paris, France, October 12, 2007.
- “A Compressed-Sensing Approach to Principal Component Analysis,” invited lecture, Texas A&M University, September 20, 2007.
- “Analysis of Redundant-Wavelet Multihypothesis for Motion Compensation,” invited lecture, École Nationale Supérieure des Télécommunications–Paris, Paris, France, May 23, 2006.
- “Research Activities,” invited lecture, ECE 1002 Introduction to ECE, Mississippi State University, October 20, 2005.
- “Multihypothesis Motion Compensation in the Redundant Wavelet Domain,” invited lecture, École Nationale Supérieure des Télécommunications–Paris, Paris, France, June 29, 2004.
- “Wavelet Transforms for Vector Fields Using Omnidirectionally Balanced Multiwavelets,” invited lecture, Graduate Student Seminar Series, Department of Electrical & Computer Engineering, Mississippi State University, Starkville, MS, September 27, 2002.
- “Wavelet Transforms for Vector Fields Using Omnidirectionally Balanced Multiwavelets,” invited lecture, Universität Konstanz–Informatik und Informationswissenschaft, Konstanz, Germany, August 30, 2002.
- “Recent Work in Data Compression at MSU ERC,” invited lecture, Institut für Informatik, Universität Leipzig, Leipzig, Germany, October 5, 2000.
- “Codage de Vidéo par Quantification Vectorielle Adaptative,” invited lecture, Laboratoire I3S, Université de Nice-Sophia Antipolis, Sophia Antipolis, France, June 12, 1998. Given in French.
- “Digital Image Processing,” invited lecture, Agricultural and Biological Engineering Graduate Seminar ABE8921, Mississippi State University, February 10, 1998.
- “Adaptive Vector Quantization Using Generalized Threshold Replenishment,” invited lecture, Institut für Informatik, Universität Freiburg, Freiburg, Germany, February 1997.
- “A Survey of Adaptive Vector Quantization,” invited lecture, Institut für Informatik, Universität Freiburg, Freiburg, Germany, February 1997.

PROFESSIONAL ACTIVITIES

Journal Editorships

- Associate Editor, *IEEE Transactions on Image Processing*, 2009 to present
- Associate Editor, *IEEE Transactions on Multimedia*, 2008 to present
- Associate Editor, *EURASIP Journal of Image & Video Processing*, 2005 to present
- Associate Editor, *IEEE Signal Processing Letters*, 2005 to 2009
- Guest Editor, special issue on “Wavelets in Source Coding, Communications, and Networks,” *EURASIP Journal of Image & Video Processing*, January 2007.

Society Technical Committee

- Image, Video, & Multidimensional Signal Processing (IVMSP) Technical Committee—IEEE Signal Processing Society
 - Vice Chair—2010 to present
 - Member—2007 to present
 - Policies & Procedures Subcommittee—2010 to present
 - Webmaster—2008 to 2010
 - Awards Subcommittee—2008 to 2010

Conference Organization and Program Committees

- General co-Chair—International Conference on Image Processing, Paris 2014
- Publicity Chair—Data Compression Conference, 2009 to present
- Program Committee—Data Compression Conference, 2005 to present
- Area Chair—IEEE International Conference on Image Processing, 2011.
- Area Chair—IEEE International Conference on Acoustics, Speech, and Signal Processing, 2011.
- Technical Program Committee—European Signal Processing Conference, 2011.
- Area Chair—IEEE International Conference on Image Processing, 2010.
- Area Chair—IEEE International Conference on Acoustics, Speech, and Signal Processing, 2010.
- Area Chair—IEEE International Conference on Image Processing, 2009.
- Area Chair—IEEE International Conference on Acoustics, Speech, and Signal Processing, 2009.
- Technical Program Committee—European Signal Processing Conference, 2009.
- Area Chair—IEEE International Conference on Image Processing, 2008.
- Area Chair—European Signal Processing Conference, 2008.
- Area Chair—IEEE International Conference on Acoustics, Speech, and Signal Processing, 2008.
- Technical Program Committee—IEEE International Conference on Image Processing, 2007.

Conference Session Chair

- IEEE International Conference on Acoustics, Speech, and Signal Processing, Prague, Czech Republic, May 2011
- Data Compression Conference, Snowbird, UT, March 2011
- IEEE International Conference on Acoustics, Speech, and Signal Processing, Dallas, TX, March 2010
- Data Compression Conference, Snowbird, UT, March 2010
- IEEE International Conference on Image Processing, Cairo, Egypt, November 2009
- IEEE International Conference on Acoustics, Speech, and Signal Processing, Taipei, Taiwan, April 2009
- Data Compression Conference, Snowbird, UT, March 2009
- IEEE International Conference on Image Processing, San Diego, CA, October 2008
- Data Compression Conference, Snowbird, UT, March 2008
- IEEE International Conference on Image Processing, San Antonio, TX, September 2007
- IEEE International Geoscience and Remote Sensing Symposium, Barcelona, Spain, July 2007
- IEEE International Conference on Acoustics, Speech, and Signal Processing, Honolulu, HI, April 2007
- Data Compression Conference, Snowbird, UT, March 2007

- Asilomar Conference on Signals, Systems, and Computers—Special Session on Geospatial Image Processing, Pacific Grove, CA, October 2006
- IEEE International Conference on Image Processing, Atlanta, GA, October 2006
- IEEE International Conference on Acoustics, Speech, and Signal Processing, Toulouse, France, May 2006 (2 sessions)
- IEEE Data Compression Conference, Snowbird, UT, March 2006
- IEEE International Conference on Image Processing, Singapore, October 2004
- IEEE International Geoscience and Remote Sensing Symposium, Toulouse, France, July 2003
- IEEE International Conference on Image Processing, Rochester, NY, September 2002

Society Memberships

- Senior member, IEEE
- Member, IEEE Signal Processing Society
- Member, IEEE Information Theory Society
- Member, European Association for Signal Image Processing
- Member, American Society for Engineering Education
- Member, Eta Kappa Nu Electrical and Computer Engineering Honor Society
- Member, Tau Beta Pi Engineering Honor Society
- Member, Phi Kappa Phi Honor Society

Publication Review

- IEEE Transactions on Image Processing
- IEEE Transactions on Circuits and Systems for Video Technology
- IEEE Transactions on Signal Processing
- IEEE Signal Processing Letters
- IEEE Transactions on Information Theory
- IEEE Transactions on Geoscience and Remote Sensing
- IEEE Geoscience and Remote Sensing Letters
- IEEE Transactions on Multimedia
- IEEE Transactions on Communications
- IEEE Transactions on Neural Networks
- IEEE Transactions on Visualization and Computer Graphics
- EURASIP Journal on Applied Signal Processing
- IEE Proceedings—Vision, Image and Signal Processing
- IEE Electronics Letters
- Optical Engineering
- Signal Processing: Image Communication
- International Journal of Computer Vision
- Image and Computing Vision Journal
- Computers & Geoscience
- Data Compression Conference (DCC)
- IEEE International Conference on Image Processing (ICIP)
- IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP)
- IEEE International Conference on Multimedia & Expo (ICME)
- European Signal Processing Conference (EUSIPCO)
- IEEE Visualization Conference

UNIVERSITY SERVICE

University Committees

- University Library Committee, 2003 to 2009

College Committees

- College Curriculum Committee, 2005 to present
 - Chair, 2007 to 2009

Departmental Committees

- Promotion and Tenure Committee, 2002–2005, 2007 to 2010
 - Chair, 2007 to 2010
- Graduate Committee, 2008 to present
 - Chair, 2008 to present
- Undergraduate Committee, 2005–2008
 - Chair, 2006–2007
- Department Head Search Committee, 2002–2003
- Computer Planning Committee, 1997–2005
 - Chair, 1999–2001
- Signal Processing Emphasis Area Committee, 1999 to present
- Circuits Core Committee, 2001–2005
- Communications Emphasis Area Committee, 1997–1999
 - Chair, 1997–1999

Other

- ECE Department MSU Library Representative, 1999 to present

STUDENTS ADVISED

Doctoral Dissertations Directed*Completed:*

- Jing Zhang (Xi'an Jiaotong University, Xi'an, China), December 2009. Dissertation: "Research on 3D Hyperspectral Imagery Compression." Co-directed with G. Liu.
- Maria Trocan (École National Supérieure des Télécommunications, Paris, France), October 2007. Dissertation: "Hierarchical Subband Representations: Application to Video." Co-directed with B. Pesquet-Popescu.
- Yonghui Wang, Computer Engineering, December 2003. Dissertation: "Fully Scalable Video Coding Using Redundant-Wavelet Multihypothesis and Motion-Compensated Temporal Filtering."
- Suxia Cui, Computer Engineering, August 2003. Dissertation: "Motion Estimation and Compensation in the Redundant Wavelet Domain."
- Li Hua, Electrical Engineering, August 2003. Dissertation: "Vector Wavelet Transforms for the Coding of Static and Time-Varying Vector Fields."

In progress:

- Sungkwang Mun, Computer Engineering.
- Eric Tramel, Computer Engineering.
- Wei Li, Electrical Engineering
- Chen Chen, Electrical Engineering
- Nam Ly, Electrical Engineering
- Vineetha Kanatte Ayarpulli, Electrical Engineering

Masters Theses Directed*Completed:*

- Kristen M. Bradley, Electrical Engineering, December 2007. Masters Thesis: "Watermarking with Wavelet Transforms."
- Joseph B. Boettcher, Computer Engineering, December 2007. Masters Thesis: "Video Coding with 3D Wavelet Transforms."

- Justin T. Rucker, Electrical Engineering, December 2005. Masters Thesis: “3D Wavelet-Based Algorithms for the Compression of Geoscience Data.”
- Madhavi Marka, Electrical Engineering, August 2002. Masters Thesis: “Object-Based Unequal Error Protection.”

Non-thesis Masters Students Supervised

Completed:

- Tong Chu, Computer Engineering, December 2000. Masters Project report: “SGI Vizserver Extension.”

Doctoral Committee Participation, committee member

- Tao Ma, Mississippi State University, November 2010. Dissertation: “Linear Dynamic Model for Continuous Speech Recognition.”
- Sundararajan Srinivasan, Mississippi State University, November 2010. Dissertation: “A Nonlinear Mixture Autoregressive Model for Speaker Verification.”
- Anish Chand Turlapaty, Mississippi State University, March 2010. Dissertation: “Application of Pattern Recognition and Adaptive DSP Methods for Spatio-Temporal Analysis of Satellite Based Hydrological Datasets.”
- Weiwei Hu, Mississippi State University, March 2010. Dissertation: “Reconfigurable Traffic Grooming with Differentiated Reliability in DWDM Mesh Networks.”
- Naveen Parihar, Mississippi State University, October 2009. Dissertation: “Parallel Viterbi Search for Continuous Speech Recognition on a Multi-Core Architecture.”
- Nareenart Raksuntorn, Mississippi State University, April 2009. Dissertation: “Unsupervised Spectral Mixture Analysis for Hyperspectral Imagery.”
- Shangshu Cai, Mississippi State University, December 2008. Dissertation: “Hyperspectral Image Visualization Using Double and Multiple Layers.”
- Saurabh Prasad, Mississippi State University, October 2008. Dissertation: “Multi-Classifiers and Decision Fusion for Robust Statistical Pattern Recognition with Applications to Hyperspectral Classification.”
- John E. Ball, Mississippi State University, May 2007. Dissertation: “Three Stage Level Set Segmentation of Mass Core, Periphery, and Spiculations for Automated Image Analysis of Digital Mammograms.”
- Nishant Chandra, Mississippi State University, May 2007. Dissertation: “Hybrid Concatenated-Formant Expressive Speech Synthesizer for Kinesensic Voices.”
- Xingjun Zhang, Mississippi State University, August 2005. Dissertation: “Critical Properties of Small World Ising Models.”
- Pushkar S. Pradhan, Mississippi State University, August 2005. Dissertation: “Multiresolution based, Multi-sensor, Multispectral Image Fusion.”
- Yanlin Guan, Mississippi State University, November 2002. Dissertation: “Interactive and Immersive Surface Interrogation Techniques Over Triangulated Surfaces.”
- Jiang Li, Mississippi State University, October 2002. Dissertation: “Linear Unmixing of Hyperspectral Signals via Wavelet Feature Extraction.”

Doctoral Committee Participation, external review

- External reviewer of dissertation of Vijayaraghavan Thirumalai, École Polytechnique Fédérale de Lausanne, Lausanne, Switzerland, December 2011. Dissertation: “Distributed Compressed Representation of Correlated Image Sets.”
- External reviewer of dissertation of Mounir Kaaniche, École National Supérieure des Télécommunications, Paris, France, December 2010. Dissertation: “Schémas de Lifting Vectoriels Adaptatifs et Applications à la Compression d’Images Stéréoscopiques.”
- External reviewer of dissertation of Claudia Teodora Petrișor, École National Supérieure des Télécommunications, Paris, France, September 2009. Dissertation: “Décompositions en Ondelettes Redondantes pour le Codage par Descriptions Multiples des Images Fixes et des Séquences Vidéo.”
- External reviewer of dissertation of Guillaume Jeannic, École Polytechnique de l’Université de Nantes, Nantes, France, November 2008. Dissertation: “Représentation Structurale d’Images par Transformées Locales en Ondelettes Orientées et Codage.”

- External reviewer of dissertation of Antoine Robert, École National Supérieure des Télécommunications, Paris, France, February 2008. Dissertation: “Transformées Orientées par Blocs pour le Codage Vidéo Hybride.”
- External reviewer of dissertation of Emmanuel Christophe, École Nationale Supérieure d’Électrotechnique, d’Électronique, d’Informatique, d’Hydraulique et des Télécommunications, Toulouse, France, October 2006. Dissertation: “Compression des Images Hyperspectrales et son Impact sur la Qualité des Données.”
- External reviewer of dissertation of Tong Gan, Nanyang Technological University, Singapore, June 2004. Dissertation: “Scalable Video Transmission Across Reservation-Based Networks and Best-Effort Networks.”
- External reviewer of dissertation and defense of Marcel Wagner, Institut für Informatik, Universität Freiburg, Freiburg, Germany, October 2000. Dissertation: “Video Coding with Adaptive Vector Quantization and Rate Distortion Optimization.”

Masters Committee Participation, external review

- External reviewer of thesis of Mow Song Ng, Multimedia University, Cyberjaya, Malaysia, January 2006. Thesis: “Scalable Subband Coding of Images.”
- External reviewer of thesis of Emna Aissa, École Nationale Supérieure des Télécommunications, Paris, France, June 2004.

Undergraduate Advising

- Ryan Irwin, 2006
- Makesha Busby, 2006
- Justin T. Rucker, undergraduate research, “Compression of Hyperspectral Imagery,” August 2002 – December 2003.
- Senior Design Team, Kristen Bradley, Justin Rucker, Mandy Baker, Jason Wilson, Philip Conley, Joe Boettcher, “SECON Hardware Competition,” Summer 2002, Fall 2002, & Spring 2003.
- Senior Design Team, Kendall Ladner, Ben Hogan, Jeffrey Jue, Brad Patano, “Radio-Controlled Duck Decoy,” Fall 2001 & Spring 2002.
- Senior Design Team, Ian Smith, April Martin, Paul Easterling, and Daniel Ling, “Wireless Modem,” Spring 2000 & Fall 2000.
- Senior Design Team, Leslie Regala and Mark McKinney, “Auto Dialing System,” Fall 1999 & Spring 2000.
- Senior Design, Andrew Tomilson, “ADC of LP record,” Fall 1999.
- Senior Design, Jason Bridges, “Audible Calling Line Identification Systems,” Fall 1998.

COURSE COORDINATION

Course Sequence Coordinator—Circuits & Electronics Sequence, 2005 to 2009

- ECE3413—Introduction to Electronic Circuits
- ECE3424—Intermediate Electronic Circuits
- ECE3434—Advanced Electronic Circuits
- ECE3163—Signals and Systems

COURSES TAUGHT

Fall 2011

- ECE8453—Introduction to Wavelets 5 students, graduate

Spring 2011

- ECE8813—Information Theory, 9 students, graduate

Fall 2010

- ECE3443—Signals and Systems, 18 students, undergraduate

Spring 2010

- ECE8483—Image & Video Coding, 5 students, graduate

Fall 2009

- ECE8453—Introduction to Wavelets 17 students, graduate

Spring 2009

- ECE8813—Information Theory, 14 students, graduate

Fall 2008

- ECE3413—Introduction to Electronic Circuits, 42 students, undergraduate

Spring 2008

- ECE8483—Image & Video Coding, 9 students, graduate
- ECE3163—Signals and Systems, 15 students, undergraduate

Fall 2007

- ECE8453—Introduction to Wavelets, 21 students, graduate

Spring 2007

- ECE8813—Information Theory, 6 students, graduate

Fall 2006

- ECE4990/6990—Multimedia Signal Processing, 17 students, undergraduate/graduate
- ECE3163—Signals and Systems, 21 students, undergraduate

Spring 2006

- ECE3163—Signals and Systems, 28 students, undergraduate

Fall 2005

- ECE3163—Signals and Systems, 24 students, undergraduate
- ECE8453—Introduction to Wavelets, 8 students, graduate

Spring 2005

- ECE8990—Information Theory, 18 students, graduate
- ECE8483—Image & Video Coding, 6 students, graduate

Spring 2004

- ECE3163—Signals and Systems, 28 students, undergraduate

Fall 2003

- ECE8453—Introduction to Wavelets, 23 students, graduate

Spring 2003

- ECE8990—Information Theory, 13 students, graduate

Fall 2002

- ECE8483—Image & Video Coding, 11 students, graduate

Spring 2002

- ECE3163—Signals and Systems, 55 students, undergraduate

Fall 2001

- ECE8453—Introduction to Wavelets, 15 students, graduate

Spring 2001

- ECE8990—Information Theory, 15 students, graduate

Fall 2000

- ECE8990—Image & Video Coding, 10 students, graduate

Spring 2000

- CPE8113—Digital Image Processing, 25 students, graduate

Fall 1999

- EE8990—Introduction to Wavelets, 21 students, graduate
- EE4813/6813—Communications Theory, 23 students, undergraduate/graduate

Spring 1999

- CPE8113—Digital Image Processing, 14 students, graduate
- EE3153—Circuit Analysis II, 24 students, undergraduate

Fall 1998

- EE4990/6990—Introduction to Wavelets, 16 students, graduate/undergraduate

Spring 1998

- CPE8113—Digital Image Processing, 11 students, graduate
- EE3123—Networks II, 22 students, undergraduate

Fall 1997

- EE4816/6813—Communications Theory, 28 students, undergraduate/graduate

Spring 1996

- EE305—Circuit Analysis, Design, and Simulation III, 60 students, undergraduate (Ohio State University)

HONORS AND AWARDS

- Billie J. Ball Endowed Professorship in Engineering, 2011–2013
- 2010 Mississippi State University StatePride Faculty Award
- 2005 Bagley College of Engineering Outstanding Research Paper, Mississippi State University
- 2003 Bagley College of Engineering Outstanding Research Paper, Mississippi State University
- Hearin Distinguished Professor, Bagley College of Engineering, Mississippi State University, 2001-2002
- 1999 Bagley College of Engineering Outstanding Research Paper, Mississippi State University
- Outstanding Research Paper, Department of Electrical & Computer Engineering, Mississippi State University, 1998, 2001, & 2002
- Recipient, International Research Fellow Award from the National Science Foundation, one year of postdoctoral research, 1997
- Châteaubriand Fellowship from the French Government for postdoctoral research, 1997 (declined)
- Recipient, Ph.D. Scholarship from the AT&T Foundation, 4 years of graduate support, 1993
- Recipient, NASA Space Grant/OAI Graduate Fellowship from the Ohio Space Grant Consortium, 2 years of graduate support, 1991
- Recipient, Ohio State University Fellowship for graduate study, 2 years of graduate support, 1990
- Graduated *summa cum laude*, The Ohio State University, rank in 1990 graduating class: 1 out of 1173
- Ohio State University Top Ten Outstanding Senior Award, the most selective award for seniors, 1990
- Marshall Scholarship finalist — invited to Chicago for an interview before the Midwest Region Marshall Scholarship Committee, 1989
- Buckeye Student Leadership Award, The Ohio State University, 1989
- Sphinx Senior Class Honorary, The Ohio State University, 1988
- Bucket and Dipper Junior Class Honorary, The Ohio State University, 1987
- Romophos Sophomore Class Honorary, The Ohio State University, 1986
- Alpha Lambda Delta/Phi Eta Sigma Freshman Class Honoraries, The Ohio State University, 1986
- Ohio Academic Scholarship from the Ohio Board of Regents, 4 yr. undergraduate scholarship, 1985

LANGUAGES

- Native language – English
- Fluent speaking, reading, and writing in French