

H. Joel Trussell, Professor

Education background

Ph.D. in Electrical Engineering and Computer Science, 1976, University of New Mexico, Albuquerque, NM.

M.S. in Mathematics, 1968, Florida State University, Tallahassee, FL.

BS in Applied Mathematics, Georgia Inst. Of Technology, Atlanta, GA.

Professional experience:

Staff Member 1/1969-8/1980, Los Alamos Scientific Laboratory, Los Alamos, NM

Visiting Professor, 4/1978-4/1979, Heriot-Watt University, Edinburgh, Scotland, U.K.

Assoc. Prof., 1980-1986, NCSU

Prof. 1986-present, NCSU

Visiting Scientist, 6/1988-8/1989, Eastman Kodak Research Labs, Rochester, NY

Visiting Scientist, 6/1997-5/1998, Color Savvy Systems, Ltd

Scholarly and professional honors:

Fellow IEEE (1994) "For contributions to the theory of multidimensional signal restoration and reproduction."

Nancy Scriba (Keating)(my advisee) won best paper at the 1996 Undergraduate Research Symposium for "Echo Cancellation in Hands Free Mobile Phones"

IEEE-SP Paper Award 1993 ("The Use of Noise Properties in Set Theoretic Estimation," with P. L. Combettes)

IEEE-ASSP Senior Paper Award 1986 ("Feasible Solution in Signal Restoration" with M. R. Civanlar)

NDEA Fellowship at Florida State University

Phi Kappa Phi

Tau Beta Pi

Phi Mu Epsilon

Sigma Xi

MASTER'S AND DOCTORAL THESES DIRECTED

9 Doctoral Theses Directed

13 Master's Theses Directed

PUBLICATIONS

BOOKS

1. I. Viniotis and J. Trussell, *Mathematics: The Language of Electrical and Computer Engineering*, Trafford Publishing, Trafford Publishing, Fall 2005. (2nd Ed. of 2 below)
2. I. Viniotis and J. Trussell, *Analytical Foundations of Electrical and Computer Engineering*, Trafford Publishing, Trafford Publishing, Spring 2004.
3. H. J. Trussell and M. J. Vrhel, *Foundations of Digital Imaging*, Cambridge Press 2007

JOURNAL PUBLICATIONS (77 TOTAL: LISTING OF LATEST 60)

1. D.H.Justice, H.J.Trussell and M.S.Olufsen, "Analysis of Blood Flow Velocity and Pressure Signals Using the Multipulse Method," *Math. Biosci and Eng.*, Vol. 3, No. 2, pp. 1-21, April 2006.
2. H. J. Trussell, E. Saber and M. J. Vrhel, "Color Image Processing: Basics and Special Issue Overview," *IEEE Signal Processing Magazine*, Vol. 22, No. 1, pp. 14-22, Jan. 2005

3. M. J. Vrhel, E. Saber and H. J. Trussell, "Color Image Generation and Display Technologies," IEEE Signal Processing Magazine, Vol. 22, No. 1, pp. 23-33, Jan. 2005
4. H. J. Trussell and E. J. Dietz, "A study of the effect of graded homework in a preparatory math course for electrical engineers," J. Engineering Education, V. 92, No. 2, pp. 141-146, April, 2003.
5. H. J. Trussell, "Image Sampling and Reconstruction," book chapter, Wiley Encyclopedia of Telecommunications, pp. 143-164, Wiley, 2003.
6. H. J. Trussell and M. J. Vrhel, "Interpolation of Signals for Colorimetric Computation," Sampling Theory in Signal and Image Processing Vol. 1, No. 1, pp. 1-23, Jan. 2002
7. M. J. Vrhel and H. J. Trussell, "Publishing Accurate Color in IEEE Journals," IEEE Trans. Image Proc., Vol. 11, No. 4, pp.373-376, Apr., 2002.
8. H. J. Trussell and R. E. Hartwig, "Mathematics of Demosaicking," IEEE Trans. Image Proc. Vol. 11, No. 4, pp. 485-492, Apr., 2002.
9. Y. Ikiz, J. P. Rust, W. J. Jasper, H. J. Trussell, "Fiber length measurement by image processing," Textile Research Journal, Vol. 71, No. 10, pp. 905- 910, Oct. 2001.
10. H. Altunbasak and H. J. Trussell, "Colorimetric Restoration of Digital Images," IEEE Trans. Image Proc., Vol. 10, No. 3, pp. 393-402, Mar., 2001.
11. H. J. Trussell, "Color and Multispectral Image Representation and Display," Chapter in Handbook of Image and Video Processing, pp. 337-354, Wiley, 2000. (second edition 2004)
12. M. J. Vrhel and H. J. Trussell, "Color Device Calibration: a mathematical formulation," IEEE Trans. Image Proc., Vol. 8, No. 12, pp. 1796-1806, Dec., 1999.
13. S. Altug, M.-Y. Chow, and H. J. Trussell, "Fuzzy Inference Systems Implemented on Neural Architectures for Motor Fault Detection and Diagnosis," IEEE Transactions on Industrial Electronics, Vol. 46, No. 6, pp. 1069-1079, December 1999.
14. S. Altug, M.-Y. Chow, and H. J. Trussell, "A Mutual Update Training Algorithm for Fuzzy Adaptive Logic Control" Decision Network (FALCON), IEEE Trans. Neural Networks, vol. 10, No. 1, pp. 196-199, Jan. 1999.
15. M.-Y. Chow, S. Altug, and H. J. Trussell, "Heuristic Constraints Enforcement for Training of and Knowledge Extraction from a Fuzzy"Neural Architecture, Part I: Foun- dation," IEEE Transactions on Fuzzy Systems, Vol. 7, No. 2, pp. 143-150, April 1999.
16. S. Altug, M. Y. Chow, and H. J. Trussell, "Heuristic Constraints Enforcement for Training of and Knowledge Extraction from a Fuzzy"Neural Architecture, Part II: Implementation and Application," IEEE Transactions on Fuzzy Systems, Vol. 7, No. 2, pp. 151-159, April 1999.
17. G. Sharma, M. J. Vrhel and H. J Trussell, "Color Imaging for Multimedia," IEEE Proceedings, Vol. 86, No. 6, pp. 1088-1108, June 1998.
18. H. J. Trussell, "Applications of Digital Signal Processing, Fuzzy Logic and Neural Nets to Computational Color," Textile Chemist and Colorist, Vol. 30, No. 2, pp. 28 - 32, Feb. 1998.
19. G. Sharma, H. J Trussell and M. J. Vrhel, " Optimal Nonnegative Color Scanning Filters," IEEE Trans. Image Proc., Vol. 7, No. 1, pp. 129-133, Jan. 1998.
20. G. Sharma and H. J Trussell, "Digital Color Processing," IEEE Trans. Image Proc., Vol. IP-6, No. 7, pp. 901-932, July 1997.

21. G. Sharma and H. J Trussell, "Figures of Merit for Color Scanners and Cameras," IEEE Trans. Image Proc., Vol. IP-6, No. 7, pp. 990-1001, July 1997
22. G. Sharma and H. J Trussell, "Set Theoretic Signal Restoration Using an Error in Variables Criterion," IEEE Trans. Image Proc., Vol. 6, No. 12, pp. 1692-1697, Dec. 1997.
23. P. L. Vora and H. J. Trussell, "Mathematical Methods for the Design of Color Scanning Filters," IEEE Trans. Image Proc. Vol. IP-6, No. 2, pp. , Feb. 1997.
24. P. L. Vora and H. J. Trussell, "Mathematical Methods for the Analysis of Color Scanning Filters," IEEE Trans. Image Proc., Vol. IP-6, No. 2, pp. , Feb. 1997.
25. Mo-yuen Chow, Yuan-Shin Lee, H. Joel Trussell, "Motor Incipient Fault Detection Using Artificial Neural Network and Fuzzy Logic Technologies," Chapter in Computer Aided Maintenance, Methodology and Practices, Dr. Jay Lee, Ed., Chapman Hall, United Kingdom (invited) 1996
26. G. Sharma and H. J Trussell, "Set Theoretic Estimation in Color Scanner Characterization," J. Elec. Imaging., Vol. 5, No. 4, pp. 479-489, Oct. 1996.
27. H. J. Trussell and M. S. Kulkarni, "Sampling and Processing of Color Signals," IEEE Trans. Image Proc., Vol. 5, No. 4, pp. 677-681, April 1996.
28. M. J. Vrhel, H. J. Trussell and Jack Bosch, "Design and realization of optimal color filters for multi-illuminant color correction," J. of Electronic Imaging, Vol. 4, No. 1, pp. 6-14, Jan. 1995.
29. M. J. Vrhel and H. J. Trussell, "Optimal Color Filters in the Presence of Noise," IEEE Trans. Image Processing, Vol. 4, No. 3, June 1995.
30. H. J. Trussell, "DSP Solutions Run the Gamut for Color Systems," IEEE Signal Processing Magazine, Vol. 10, No. 2, pp. 8-23, April 1993.
31. M. J. Vrhel and H. J. Trussell, "Filter Considerations in Color Correction," IEEE Trans. Image Processing, Vol. 3, No. 2, pp. 147-161, March 1994.
32. P. L. Vora and H. J. Trussell, "Measure of Goodness of a Set of Colour Scanning Filters," J. Optical Soc. of Am., Vol. 10, No. 7, pp. 1499-1508, July 1993.
33. P.L. Combettes and H.J. Trussell, "Deconvolution with Bounded Uncertainty," International Journal of Adaptive Control and Signal Processing, Vol. 9, No. 1, pp. 3-17, January 1995.
34. M. J. Vrhel and H. J. Trussell, "Color Correction Using Principal Components," Color Research and Applications, Vol. 17, No. 5, pp. 328-338, Oct. 1992.
35. A. E. Savakis and H. J. Trussell, "Blur Identification by Residual Spectral Matching," IEEE Transactions on Image Processing, Vol. 2, No. 2, pp. 141-151, April 1993.
36. A. E. Savakis and H. J. Trussell, "On the Accuracy of PSF Representation in Image Restoration," IEEE Transactions on Image Processing, Vol. 2, No. 2, pp. 252-259, April 1993.
37. M. I. Sezan and H. J. Trussell, "Prototype Image Constraints for Set Theoretic Image Restoration," IEEE Transaction on Acoustics, Speech and Signal Processing, Vol. 39, No. 10, pp. 2275-2285, Oct. 1991.
38. P. L. Combettes and H. J. Trussell, "The Use of Noise Properties in Set Theoretic Estimation," IEEE Transaction on Signal Processing, Vol. 39, No. 7, pp. 1630-1641, July 1991.

39. P.L. Combettes and H.J. Trussell, "Set Theoretic Estimation by Random Search," *IEEE Transactions on Signal Processing*, Vol. 39, No. 7, pp. 1669-1672, July 1991.
40. H. J. Trussell, "Applications of Set Theoretic Methods to Color Systems," *Color Research and Applications*, Vol. 16, No. 1, pp. 31-41, Feb. 1991.
41. P. L. Combettes and H. J. Trussell, "Best Stable and Invertible Approximations for ARMA Systems," *IEEE Transactions on Signal Processing*, Vol. 40, No. 12, pp. 3066-3069, Dec. 1992.
42. H. J. Trussell and S. Fogel, "Identification and Restoration of Spatially Variant Motion Blurs in Sequential Images," *IEEE Transaction on Image Processing*, Vol. 1, No. 1, pp. 123-126, Jan. 1992.
43. A. M. Tekalp and H. J. Trussell, "Comparitive Study of Some Statistical and Set-Theoretic Methods for Image Restoration," *Computer Vision, Graphics and Image Processing: Graphical Models and Image Processing*, Vol. 53, No. 2, pp. 108-120, Mar. 1991.
44. H.J. Trussell, M. I. Sezan and D. Tran, "Sensitivity of Color LMMSE Restoration of Images to the Spectral Estimate," *IEEE Transactions on Acoustics, Speech and Signal Processing*, Vol. 39, No. 1, pp. 248-252, Jan. 1991.
45. P.L. Combettes and H.J. Trussell, "Method of Successive Projections for Finding a Common Point of Sets in Metric Spaces," *Journal of Optimization Theory and Applications*, Vol. 67, No. 3, pp. 487-507, Dec. 1990.
46. M. Cooley, H. J. Trussell and I. J. Won, "Seismic Deconvolution by Multipulse Methods," *IEEE Transaction on Acoustics, Speech and Signal Processing*, Vol. 38, No. 1, pp. 156-160, Jan. 1990.
47. P.L. Combettes and H.J. Trussell, "Methods for Digital Restoration of Signals Degraded by a Stochastic Impulse Response," *IEEE Transaction on Acoustics, Speech and Signal Processing*, vol. ASSP-37, no. 3, pp. 393-401, March 1989.
48. H.J. Trussell, L.L. Arnder, P.R. Moran and R.C. Williams, "Corrections for Nonuniform Sampling Distortions in Magnetic Resonance Imagery," *IEEE Transaction on Medical Imaging*, vol. MI-7, no. 1, pp. 32-44, March 1988.
49. J.D.Wang and H.J. Trussell, "Adaptive Harmonic Noise Cancellation with application to Distribution Power Line Communications," *IEEE Transactions on Communications* vol. 36, no. 7, pp. 875-884, July 1988.
50. H.J. Trussell, H. Orun-Ozturk and M.R. Civanlar, "Errors in Reprojection Methods in Computerized Tomography," *IEEE Transactions on Medical Imaging*, vol. MI-6, no. 3, pp 220-227, September 1987.
51. M.R. Civanlar and H.J. Trussell, "Digital Signal Restoration Using Fuzzy Sets," *IEEE Transactions on Acoustics, Speech and Signal Processing*, vol. ASSP-34, no. 4, pp. 919-936, August 1986. (also included in *Digital Image Processing*, ed. R. Chellappa, IEEE Press, 1992)
52. M.R. Civanlar and H.J. Trussell, "Constructing Membership Functions Using Statistical Data," *Fuzzy Sets and Systems*, vol. 18, pp. 1-13, January 1986.
53. H.J. Trussell, J.D.Wang, "The Effect of Hard Limiters on Signal Detection in Harmonic Noise Using Adaptive Noise Cancellation," *IEEE Transactions on Power Delivery*, vol. PWRD-1, no. 1, pp. 73-78, January 1986.
54. H.J. Trussell and M.R. Civanlar, "The Landweber Iteration and Projection Onto Convex Sets," *IEEE Transactions on Acoustics, Speech and Signal Processing*, vol. ASSP-33, no. 6, pp. 1632-1634, December 1985.
55. R.M. Vines, H.J. Trussell, K.C. Shuey and J.B. O'Neal, Jr., "Impedance of the Residential Power Distribution Circuit," *IEEE Transactions on Electromagnetic Compatibility*, vol. EMC-27, no. 1, pp 6-12, February 1985.
56. H.J. Trussell and J.D. Wang, "Cancellation of Harmonic Noise in Distribution Line Communications," *IEEE Transactions on Power Applications and Systems*, vol. PAS- 104, no. 12, pp. 3338-3344, December 1985.

57. R.M. Vines, H.J. Trussell, L.J. Gale, and J.B. O'Neal, "Noise on Residential Power Distribution Circuits," IEEE Transactions on Electromagnetic Compatibility vol. EMC- 26, no. 4, pp. 161-168, Nov. 1984.
58. H.J. Trussell and M.R. Civanlar, "The Feasible Solution in Signal Restoration," IEEE Transactions on Acoustics, Speech and Signal Processing, vol. ASSP-32, no. 2, pp. 201-212, April 1984. (IEEE-Acoustics, Speech and Signal Processing Senior Paper Award, 1986; included in Multidimensional Digital Signal Processing, IEEE Press, 1986.)
59. H.J. Trussell, "A Priori Knowledge in Algebraic Restoration Methods," Chapter, published in Signal and Image Reconstruction from Incomplete Data: Theory and Applications, T.S. Huang, ed., JAI Press 1984, pp. 265-316.
60. H. J. Trussell, "Convergence Criteria for Iterative Restoration Methods," IEEE Transactions on, Acoustics, Speech and Signal Processing, vol. ASSP-31, no. 1, pp. 129-136, February 1983.

PEER-REVIEWED CONFERENCE/WORKSHOP PUBLICATIONS(110 TOTAL: LISTING LATEST 30)

1. H. Zeng, H. Joel Trussell, "Feature selection Using a mixed-Norm Penalty Function," Proc. IEEE Int. Conf. on Image Proc., 8-11 Oct. 2006, Atlanta, GA.
2. H. Zeng, H. Joel Trussell, "Image Analysis Under Varying Illumination," Proc. IEEE Int. Conf. on Image Proc., 8-11 Oct. 2006, Atlanta, GA
3. D. M. Rouse and H. J. Trussell, "Estimation of Spatially Varying Illumination in Hyperspectral Images," Proc. IEEE Int. Conf. on Image Proc., 11-14 Sept., 2005, Genoa, Italy
4. D.H.Justice, H.J.Trussell and M.S.Olufsen, "Using Speech Processing Methods to Model Blood Flow Signals" Proc. EUSIPCO 2005, 5-8 September 2005, Antalya, Turkey
5. H. J. Trussell, A. A. Nilsson, P. M. Patel and Y. Wang, "Characterization, Estimation and Detection of Network Application Traffic," Proc. EUSIPCO 2005, 5-8 September 2005, Antalya, Turkey
6. H. J. Trussell and D. M. Rouse, "Reducing Non-zero Coefficients in FIR Filter Design Using POCS," Proc. EUSIPCO 2005, 5-8 September 2005, Antalya, Turkey.
7. Huiwen Zeng and H. J. Trussell, "Dimensionality Reduction in Hyperspectral Image Classification," Proc. IEEE Int. Conf. on Image Proc., 25-28 Oct., 2004, Singapore.
8. M. Rouse and H. J. Trussell, "A Set Theoretic Approach to Target Detection using Spectral Signature Statistics," Proc. IEEE Int. Conf. on Image Proc., 25-28 Oct., 2004, Singapore.
9. D. H. Justice, H. J. Trussell M. S. Olufsen, "Modeling of Blood Flow Velocity and Pressure Signals Using the Multipulse Method," Proceedings of 11th IEEE Digital Signal Processing Workshop, pp320-324, 1-4 August 2004, Taos, NM.
10. H. J. Trussell, A. A. Nilsson, P. M. Patel, Y. Wang, "Estimation and Detection of Network Traffic," Proceedings of 11th IEEE Digital Signal Processing Workshop, pp 246-248, 1-4 August 2004, Taos, NM.
11. D. M. Rouse and H. J. Trussell, "Estimation of Mixture Densities from Histograms," Proc. IEEE Int. Conf. on Acous., Speech and Sig. Proc., 17-21 May 2004, Montreal.
12. B. Ayhan, M.-Y Chow, H.J. Trussell, M.-H Song, "A Case Study on the Comparison of Non-parametric Spectrum Methods for Broken Rotor Bar Fault Detection," Proceedings IEEE IECon'03, Roanoke, VA, Nov 2 – Nov 6, 2003.

13. B. Ayhan, M.-Y. Chow, H. J. Trussell, M.-H. Song, E.-S. Kang, and H.-J. Woo, "Statistical Analysis on a Case Study of Load Effect on PSD Technique for Induction Motor Broken Rotor Bar Fault Detection," Proceedings of IEEE SDEMPED '03, Atlanta, Georgia, USA, 24-26 August, 2003.
14. M. J. Vrhel, H. J. Trussell, H. Zeng, "Color Correction and Interpolation with Few Samples," Proc. IEEE Int. Conf. on Image Proc., 14-17 Sept. 2003, Barcelona.
15. D. H. Justice, H. J. Trussell and R. E. Hartwig, "Super-resolution of Interleaved Samples," Proc. IEEE Int. Conf. on Acous., Speech and Sig. Proc., 7-10 April, 2003, Hong Kong.
16. H. J. Trussell, "A Study of the Effect of Graded Homework in a Preparatory Math Course for Electrical Engineers," 2nd IEEE Signal Processing Education Workshop, October 13-16, 2002, Pine Mountain, Georgia
17. M. J. Vrhel and H. J. Trussell, "Color Printer Characterization in MATLAB," Proc. IEEE Int. Conf. on Image Proc., 22-25 Sept. 2002, Rochester, NY
18. C. Trivedi, H. J. Trussell, A. A. Nilsson, M.-Y. Chow, "Implicit Traffic Classification for Service Differentiation," 15th ITC Specialist Seminar, Internet Traffic Engineering and Traffic Management, July 22.-24. 2002, Würzburg, Germany.
19. H. J. Trussell, "A MMSE Estimate for Demosaicking," Proc. IEEE Int. Conf. on Image Proc., 7-11 Oct. 2001, Thessaloniki, Greece.
20. Rust, J., Y. Ikiz, H. J. Trussell and W. Jasper, "Dealing with Fiber Crossovers in Fiber Length Measurement by Image Processing," Transactions of the 2000 EFS Conference, Raleigh, NC (Nov. 2-3, 2000)
21. H. J. Trussell and M. C. Ozturk, "A digital signal processing introduction for sophomore electrical and computer engineering students," 1st IEEE Signal Processing Education Workshop, October 15-18, 2000, Hunt, Texas
22. H. J. Trussell and M. J. Vrhel, "Image Display in Teaching Image Processing; Part I: Monochrome Images," Proceedings IEEE Int. Conf. on Acoustics, Speech and Sig. Proc., 5-9 June 2000, Istanbul, Turkey.
23. H. J. Trussell, "Color Imaging: Some things you might not want to know," Symposium on Image Understanding, SIU'99, June 17-18, 1999, Ankara, Turkey.
24. H. J. Trussell and M. J. Vrhel, "Modelling of Color Scanners Using Neural Networks," Proceedings IEEE-EURASIP Workshop on Nonlinear Signal and Image Processing (NSIP'99) June 20-23, 1999, Antalya, Turkey
25. H. J. Trussell and M. J. Vrhel, "Color Scanner Calibration via a Neural Network," Proceedings IEEE Int. Conf. on Acoustics, Speech and Sig. Proc., Mar. 15-19, 1999, Phoenix, AZ.
26. H. J. Trussell, "Applications of Computational Color to Hyperspectral Imaging," Workshop on Hyperspectral/Multispectral Sensors, Measurements, Modeling and Simulation, 7-9 Sept. 1999, Redstone Arsenal, AL.
27. H. Celebi and H. J. Trussell, "Colorimetric Restoration of Digital Images," Proc. IEEE Int. Conf. on Image Proc., Vol. , Chicago, IL, 4-7 Oct. 1998
28. M.-Y. Chow, S. Altug, and H. J. Trussell, "Set Theoretic Based Neural-Fuzzy Motor Fault Detector," IECon'98, 31 Aug. - 4 Sept. 1998, Aachen, Germany
29. M.-Y. Chow, S. Altug, and H. J. Trussell, "Extracting Heuristically Acceptable Information from Fuzzy Neural Architectures via Heuristic Constraint Enforcement, Part I: Foundation," Proc. 1998 IEEE World Congress on Computational Intelligence, Anchorage. AK May 4-9, 1998
30. H. J. Trussell and M. J. Vrhel, "Effects of Interpolation and Smoothing of Color Matching Functions," Proc. IEEE Int. Conf. on Image Proc., Vol. , 26-29 October 1997, Santa Barbara, CA