October 26, 2002

CURRICULUM VITAE

PERSONAL

NAME	Alfred O. Hero III, Ph.D
DATE/PLACE OF BIRTH	December 5, 1955, Boston, MA

DEGREES

B.S., Boston University, *summa cum laude*, (1980)
M.S., M.A., Princeton University, (1982)
Ph.D., Princeton University, December (1984)

EMPLOYMENT

Permanent Positions

Sept. 2000-present	Professor Statistics The University of Michigan Ann Arbor, MI.
Sept. 1996-present	Professor Electrical Engineering and Computer Science The University of Michigan Ann Arbor, MI.
Sept. 1996-present	Professor Bio-Medical Engineering The University of Michigan Ann Arbor, MI.
Sept. 1990-1996	Associate Professor Electrical Engineering and Computer Science The University of Michigan Ann Arbor, MI.
Sept. 1984-1990	Assistant Professor Electrical Engineering and Computer Science The University of Michigan Ann Arbor, MI.

Temporary Positions

June 2001	Visiting Professor Université de Nice-Sophia Antipolis Sophia-Antipolis, France.
June-Aug 1999	Visiting Professor Ecole Nationale Supérieure des Télécommunications (ENST) Paris, France.

April-May 1999	Visiting Scientist Bell Laboratories, Lucent Technologies Murray Hill, NJ.
Jan.-April 1999	Visiting Scientist (Chargé de Recherche) CNRS Ecole Normale Supérieure (ENS) Lyon, France.
July - Aug. 1993	William Clay Ford Fellow Scientific Research Laboratory, Ford Motor Co., Dearborn MI.
July 1991 - Jan. 1992	Visiting Scientist Ecole Nationale Supérieure des Techniques Avancées Paris, France.
Aug. 1987, 1988, 1989	Visiting Scientist M.I.T. Lincoln Laboratory Lexington, MA.
Consulting:	TELTECH, ERIM, Veridian Intl, MIT Lincoln Laboratory, Irwin Magnetics, AEL Defense Corp., Echlin International Corporation, Sprague Devices, Automotive Controls Corporation, Hutchinson Technology, Ford Motor Co., Lucent Bell Labs

Patents:

"Method and system for extracting features in a pattern recognition system" (with W.J. Williams, E.J. Zalubas, J.C. O'Neill, R.M. Nickel), United States Patent 6,178,261, Jan. 23, 2001.

Courses Taught: UM

EECS 206	Signals and Systems I.
EECS 210	Introduction to Electrical Engineering I.
EECS 453	Analog Communications.
EECS 501	Probability and Random Processes.
EECS 564	Estimation, Filtering and Detection.
EECS 559	Advanced Signal Processing.
EECS 659	Adaptive Signal Processing.
EECS 750	Signal Processing: State of the Art and Unsolved Problems.

Short Courses:

"Signal detection theory and application," A.O. Hero, five day short course given at EG&G, Inc. , Las Vegas, NV, June 1998.

"Methodes d'evaluation de l'erreur minimale atteignable en estimation de paramètres," A. O. Hero, one day short course on Evaluation et Utilisation de Bornes d'Erreur en Estimation Paramètrique, University of Nice, France, Nov.29, 1991.

"Aspects of optimal estimation theory," A. O. Hero, short course given at Laboratoire des Signaux et Systèmes (LSS) Ecole Supérieure d'Electricité, Gif-sur-Yvette, France, Oct. 1991.

Thesis Committee Chairmanships:

1. "Tradeoffs and limitations in statistically based image reconstruction problems," Tom Kragh, PhD thesis, Dept. EECS, Univ. of Michigan, Sept. 2002. Presently Research Staff at MIT Lincoln Laboratory.
2. "Three dimensional shape modeling: segmentation, reconstruction and registration," Jia Li, PhD thesis, Dept. EECS, Univ. of Michigan, Jan. 2002. Presently Assistant Professor at Oakland University, Rochester, MI.
3. "Adaptive equalization and coding for space-time communications," Mahesh Godavarti, PhD thesis in Dept. EECS, Univ. of Michigan, July 2001. presently research staff at Altrawideband, Inc., CA.
4. "Quantization strategies for low power communications," Robby Gupta, PhD thesis in Dept. EECS, Univ. of Michigan, May 2001. Presently Research Staff at TRW, Inc., LA.
5. "Parametric and non-parametric approaches for multisensor data fusion," Bing Ma, PhD thesis in Dept. EECS, Univ. of Michigan, Jan. 2001. Presently Research Staff at M-Vision, Belleville, MI.
6. "Adaptive target detection in radar imaging," Hyung Soo Kim, PhD thesis in Dept. EECS, Univ. of Michigan, Jan. 2001. Presently Research Staff at M-Vision, Belleville, MI.
7. "System modeling, sampling, interprolation and iterative reconstruction for the 3D Compton camera," Anne C. Sauve, PhD thesis in Dept. EECS, Univ. of Michigan, Jan. 2000. Presently Visiting Scholar in the Dept. of Statistics at UC Berkeley..
8. "Robust fusion of MRI and ECT data, and acceleration of EM Algorithm using proximal point approach," Robinson Piramuthu, PhD thesis in Dept. EECS, Univ. of Michigan, May 2000. Presently Research Staff at KLA-Tencor, Inc., CA.
9. "Recursive algorithms for digital communications using the discrete wavelet transform," Ilan Sharfer, PhD thesis in Dept. EECS, Univ. of Michigan, Oct. 1996. Presently Research Engineer at Orcit, Inc., Israel.
10. "Improved penalized likelihood image reconstruction of anatomically correlated emission computed tomography data," Steve Titus, (co-chair with Prof. J. A. Fessler) PhD thesis in Dept. EECS, Univ. of Michigan, Oct. 1996. Presently Research Engineer, Accelerant Networks, OR.
11. "Biased and unbiased Cramer-Rao bounds: computational issues and applications," Mohammed Usman, PhD thesis in Dept. EECS, Univ. of Michigan, Aug. 1994. Presently Dept Head, Phillips Research, CA.
12. "ADEPT: Task Specific Adaptive Beamforming," Ronald A. Delap, PhD thesis in Dept. of EECS, Univ. of Michigan, May 1994. Presently Associate Professor, Air Force Institute of Technology, Wright-Patterson AFB, OH.
13. "Optimal Strategies and Tradeoffs for Joint Detection and Estimation," Bülent Baygün, PhD thesis in Dept. of EECS, Univ. of Michigan, Oct. 1992. Presently Financial Analyst, Salomon Brothers, NY.

14. "Time Delay Estimation for Inhomogeneous Poisson Processes in the Presence of Gaussian Noise," Nick Antoniadis, PhD thesis in Dept. EECS, Univ. of Michigan, Oct. 1992. Presently Research Engineer at Hitec, Athens Greece.

15. "Optimal Arrival Time Estimators for Electromagnetic Radiation Detectors," Nick Petrick, PhD thesis in Dept. EECS, Univ. of Michigan, July 1992. Presently Research Scientist, Dept. of Nuclear Engineering, Univ. of Michigan, Ann Arbor, MI.

16. "Error Bounds in Constrained Estimation," John D. Gorman, PhD thesis in Dept. EECS, Univ. of Michigan, June 1991. Presently Vice President for Research, SET Associates, Maryland.

17. "Time Delay Estimation with Nuisance Parameters: Performance Approximation and Coarse Acquisition," Joong K. Kim, PhD thesis in Dept. EECS, Univ. of Michigan, Oct. 1989. Presently Professor, Sung Kyun Kwan University, South Korea.

18. "Mutual Information Optimization and Evaluation of Single Photon Computed Tomography," Ling Shao, PhD thesis in Program in Bioengineering, Oct. 1989. Presently Dept. Head at ADAC, Inc, CA.

PUBLICATIONS:

Refereed Journals

1. "A fast spectral method for active 3D shape reconstruction," , submitted to Journal of Mathematics and Image Analysis," J. Li and A. O. Hero , Oct 2002.

2. "Relative location estimation in sensor networks," N. Patwari, A. O. Hero, M. Perkins, N. S. Correal and R. J. O'Dea , submitted to IEEE Trans. on Signal Processing, Special Issue on Signal Processing in Networks , Oct. 2002.

3. "Unicast-based inference of network link delay distributions using mixed finite mixture models," (.pdf) , C. Shih and A. O. Hero , submitted to IEEE Trans. on Signal Processing, Special Issue on Signal Processing in Networks , Oct. 2002.

4. "Image registration using alpha-entropy measures and entropic graphs," H. Neemuchwala, A. O. Hero and P. L. Carson, submitted to European Journal of Signal processing, June 2002.

5. "Convergence of differential entropies," M. Godavarti and A. O. Hero , submitted to IEEE Trans. on Info Theory , Nov. 2001.

6. "Analysis of the sequential partial update LMS algorithm", M. Godavarti and A. O. Hero, submitted to IEEE Trans. on Signal Processing, Oct. 2001.

7. "Stochastic partial update LMS algorithm", M. Godavarti and A. O. Hero, submitted to IEEE Trans. on Signal Processing, Oct. 2001.

8. "Multiple antenna capacity in a deterministic Rician fading channel," M. Godavarti and A. O. Hero, submitted to IEEE Trans. on Info Theory , Sept. 2001.

9. "High rate vector quantization for detection," R. Gupta and A. O. Hero, IEEE Trans. on Inform. Theory, submitted Sept. 2001.

10. "Asymptotic rates of convergence of random minimal graphs," A. O. Hero, J. Costa and B. Ma, IEEE Trans. on Inform. Theory, Submitted Aug. 2001.

11. "Secure space-time communications," A. O. Hero, IEEE Trans. on Inform. Theory, Submitted April 2001.

12. A. O. Hero, B. Ma, O. Michel and J. Gorman, "Applications of entropic spanning graphs," IEEE Signal Proc. Magazine (Special Issue on Mathematical Imaging) Oct. 2002.

13. "MIMO Environmental Capacity Sensitivity", D. W. Bliss, K. W. Forsythe and A. O. Hero, IEEE Trans. on Signal Processing, Sept. 2002.

14. "Network Tomography", Mark Coates, Alfred Hero, Robert Nowak, Bin Yu, IEEE Signal Processing Magazine (Special Issue in Signal Processing for Networks), Vol. 19, No. 3, pp. 47-65, May 2002.

15. "Comparison of GLR and invariance detectors under structured clutter covariance," H.S. Kim and A. O. Hero, IEEE Trans. on Image Processing, Vol IP-10, No. 10, pp. 1509-1520, Oct. 2001.

16. "MST, entropies et divergences : applications," O. Michel, A. O. Hero and P. Flandrin, (English title: "MST: entropies and divergences") Traitement du Signal, Dec. 2000.

17. "Cut-off rate and signal design for the quasi-static Rayleigh fading space-time channel," A. O. Hero and T. L. Marzetta, IEEE Trans. on Inform. Theory, Vol IT-47, No 6, pp. 2400-2416, July 2001.

18. "Simultaneous detection of lane and pavement boundaries using model-based multisensor fusion," B. Ma, S. Lakshmanan, and A. O. Hero, IEEE Transactions on ITS (Intelligent Transportation Systems) special issue on Vision Applications and Technology for Intelligent Vehicles - Part II: Vehicles, Vol ITS-1, No. 3, pp. 135-147, Sept. 2000.

19. "Power-performance tradeoffs and optimal bit allocation in reduced resolution adaptive filtering," R. Gupta and A. O. Hero, IEEE Trans. on Sig. Proc., Vol. SP-48, No. 10, pp. 2772-2784, Sept. 2000.

20. "Kullback proximal algorithms for maximum likelihood estimation," S. Chretien and A. O. Hero, IEEE Trans. on Inform. Theory, Vol IT-46, No. 5, pp. 1800-1810, Aug. 2000.

21. "Word spotting in bitmapped fax documents," W.J. Williams, E. Zalubas and A.O. Hero, Information Retrieval, vol 2, pp. 207-226, May 2000.

22. "3D reconstruction for a Compton SPECT camera model" A. C. Sauve, A. O. Hero, W. L. Rogers, S. Wilderman and N. H. Clinthorne, IEEE Trans. on Nuclear Science, Vol. 46, No. 6, pp. 2075-2084, Nov. 1999.

23. "Tree structured non-linear signal modeling and prediction," O. Michel, A. O . Hero and A.-E. Badel, IEEE Trans. on Signal Processing, Vol. SP-47, No. 11, pp. 3027-3041, Nov. 1999.

24. "Asymptotic theory of greedy approximations to minimal K-point random graphs," A. O. Hero and O. Michel, IEEE Trans. on Information Theory, Vol. IT-45, pp. 1921-1939, Sept. 1999.

25. "Sur un problème d'estimation pour des processus de Poisson composés et filtrés," (In French - English title, "On a problem of estimation for filtered composed Poisson processes") A. O. Hero, Traitement du Signal, Vol. 15, No. 6, pp. 493-502, May 1999.

26. "Minimax emission computed tomography using high-resolution anatomical side information and B-spline models," A. O. Hero, R. Piramuthu, J. A. Fessler and S. R. Titus, IEEE Trans. on Information Theory (Special issue on Multiscale Statistical Signal Analysis and its Applications), Vol 45, No. 3, pp. 920-938, April 1999.

27. "A maximum likelihood digital receiver using the EM algorithm and the discrete wavelet transform", I. Sharfer and A. O. Hero, IEEE Transactions on Signal Processing, Vol. 47, No. 3, pp. 813-825, Mar. 1999.

28. "Highlights of Statistical Signal and Array Processing," A.O. Hero (Ed.) with the IEEE SSAP Technical Committee, IEEE Signal Processing Magazine, Vol 15, No. 5, pp. 21-66, Sept. 1998.

29. "Comparaison de systèmes et arbres de regression," (In French - English title, "Comparison of systems and regression trees") A.-E. Badel, O. Michel, and A.O. Hero, Traitement du Signal, July 1998.

30. "Data-recursive algorithms for blind channel identification in oversampled communication systems", D. Goeckel, A. O. Hero, and W. E. Stark, IEEE Transactions on Signal Processing, Vol. 46, No. 8, pp. 2217-2220, Aug. 1998.

31. "Scale and translation invariant methods for enhanced time-frequency pattern recognition," W.J. Williams, E. Zalubas, R. M. Nickel, and A.O. Hero, Journ. Multidimensional Systems and Signal Processing, vol 9, pp. 465-473, Nov. 1998.

32. "Discussion on 'The EM algorithm – an old folk-song sung to a fast new tune," by X.-L. Meng and D. van Dyk," A.O. Hero, Journal of the Royal Statistical Society, Ser. B, Vol 59, No. 3, pp. 511-567, 1997.

33. "Arbres de règression: Modélisation non-parametrique et analyse des séries temporelles," (In French - English title, "Regression trees for non-parametric modeling and time series analysis") A. Badel, O. Michel and A. O. Hero, Traitement du Signal, Vol. 14, No. 2, pp. 117-133, 1997.

34. "Recursive algorithms for computing the Cramer-Rao bound," A.O. Hero, M. Usman, A.C. Sauve and J.A. Fessler, IEEE Trans. on Signal Processing, Vol. SP-45, Vol. 3, pp. 803-807, Mar. 1997 (Corresp.).

35. "Exploring estimator bias-variance tradeoffs using the uniform CR bound," A.O. Hero, J.A. Fessler, and M. Usman, IEEE Trans. on Signal Processing, Vol. SP-44, No. 8, pp. 2026-2041, Aug. 1996. (**Best Paper Award, IEEE Signal Processing Society**)

36. "Simulation of cardiac memory in a computer model using reactive coupling," R. Goyal, A.O. Hero and F. Morady, Journal of Electrocardiology, Vol. 28, pp. 180-183, 1995.

37. "Penalized maximum likelihood image reconstruction using space alternating generalized EM algorithms," J.A. Fessler and A.O. Hero, IEEE Trans. on Image Processing, Vol 4, No. 10, pp. 1417-1429, Oct 1995.

38. "Optimal simultaneous detection and estimation under a false alarm constraint," B. Baygün and A.O. Hero, IEEE Trans. on Inform. Theory, Vol. 41, No. 3, pp. 688-703, May 1995.

39. "Convergence in norm for EM-type algorithms," A.O. Hero and J.A. Fessler, Special Theme Section on the EM Algorithm, Statistica Sinica, Vol 5, No. 1, pp. 41-54, Jan. 1995.

40. "Space-alternating generalized expectation-maximization algorithm," J.A. Fessler and A.O. Hero, IEEE Trans. on Signal Processing, Vol. SP-42, No. 10, pp. 2664-2677, Oct. 1994.

41. "A fast least squares arrival time estimator for scintillation pulses," N. Petrick, A.O. Hero, N.H. Clinthorne, W.L. Rogers, IEEE Trans. on Nuclear Science, Vol. NS-41, No. 4, pp. 758-761, Aug. 1994.

42. "Time delay estimation for filtered Poisson processes using an EM-type algorithm," N. Antoniadis, and A.O. Hero, IEEE Trans. on Signal Processing, Vol. 42, No. 8, pp 2112-2123, Aug. 1994.

43. "A recursive algorithm for computing CR-type bounds on estimator covariance," A.O. Hero and J.A. Fessler, IEEE Trans. Information Theory, pp. 1205-1205, July 1994 (Corresp.).

44. "Model-based estimation for dynamic cardiac studies using ECT," P.-C. Chiao, W.L. Rogers, N.H. Clinthorne, J.A. Fessler, and A.O. Hero, IEEE Trans. Medical Imaging, Vol. MI-13, No. 2, pp. 217-226, June 1994.

45. "Model-based estimation with boundary side information or boundary regularization," P.-C. Chiao, W.L. Rogers, N.H. Clinthorne, J.A. Fessler, and A.O. Hero, IEEE Trans. Medical Imaging, Vol. MI-13, No. 2, pp. 227-235, June 1994.

46. "Least squares arrival time estimators for single and piled up scintillation pulses," N. Petrick, A.O. Hero, N.H. Clinthorne, W.L. Rogers, and J.M. Slosar, IEEE Trans. on Nuclear Science, Vol. NS-40, No. 4, pp. 1026-1031, Aug. 1993.

47. "Least squares arrival time estimators for photons detected using a photomultiplier tube," N. Petrick, A.O. Hero, N.H. Clinthorne, and W.L. Rogers, IEEE Trans. on Nuclear Science, Vol. NS-39, No. 4, pp. 738-743, Aug. 1992.

48. "On achievable accuracy in edge localization," R. Kakarala and A. O. Hero, IEEE Trans. on Pattern Recognition and Machine Intelligence (PAMI), Vol. 14, No. 7, pp. 777-781, July 1992 (Corresp.).

49. "A lower bound on PET timing estimation with pulse pileup," A.O. Hero, N.H. Clinthorne and W.L. Rogers, IEEE Trans. Nuclear Science, Vol. NS-38, No. 2, pp. 709-712, April 1991.

50. "Timing estimation for filtered Poisson processes in additive Gaussian noise," A.O. Hero, IEEE Trans. on Information Theory, Vol. IT-37, pp. 92-106, Jan. 1991.

51. "A method for improved time-of-arrival estimation for weak optical pulses with applications to scintillation detectors," N.A. Petrick, A.O. Hero, N.H. Clinthorne, and W.L. Rogers, IEEE Trans. on Nuclear Science, Vol. NS-38, No. 2, pp. 174-177, April 1991.

52. "Lower bounds for parametric estimation with constraints," J.D. Gorman and A.O. Hero, IEEE Trans. on Information Theory, Vol. IT-36, pp. 1285-1301, Nov. 1990.

53. "A fundamental limit on timing performance with scintillation detectors," N.H. Clinthorne, W.L. Rogers, A.O. Hero, IEEE Trans. on Nuclear Science, Vol. NS-37, No. 2, pp. 658-663, April 1990.

54. "Information gain from count corrections in SPECT image reconstruction and classification," L. Shao, A.O. Hero, W.L. Rogers, N.H. Clinthorne, IEEE Trans. on Nuclear Science, Vol. NS-37, No. 2, pp. 652-657, April 1990.

55. "Optimal and sub-optimal post-detection timing estimators for PET," A.O. Hero, N. Antoniadis, N. Clinthorne, W.L. Rogers, G.D. Hutchins, IEEE Trans. on Nuclear Science, Vol. NS-37, No. 2, pp. 725-729, April 1990.

56. "Information analysis of single photon computed tomography with count losses," A.O. Hero and L. Shao, IEEE Trans. on Medical Imaging, Vol. MI-9, No. 3, pp. 117-127, June 1990.

57. "The mutual information criterion for the design and evaluation of SPECT apertures," L. Shao, A.O. Hero, W.L. Rogers, and N.H. Clinthorne, IEEE Trans. on Medical Imaging, Vol. MI-8, pp. 322-336, Dec. 1989.

58. "Lower bounds on estimator performance for energy invariant parameters of multi-dimensional Poisson processes," A.O. Hero, IEEE Trans. on Information Theory, Vol. IT-35, pp. 843-858, July 1989.

59. "Application of the mutual information criterion to assessing gamma cameras," N.H. Clinthorne, W.L. Rogers, L. Shao, A.O. Hero and K.F. Koral, IEEE Trans. on Nuclear Science, Vol. NS-36, pp. 1127-1131, Feb. 1989.

60. "Poisson models and mean square error for correlator estimators of time delay," A.O. Hero and S.C. Schwartz, IEEE Trans. on Information Theory, Vol. IT-34, pp. 287-303, March 1988.

61. "A new generalized cross-correlator," A.O. Hero and S.C. Schwartz, IEEE Trans. on Acoustics, Speech and Signal Processing, Vol. ASSP-33, No. 1, pp. 38-45, Feb. 1985.

Conference Plenary and Keynote Presentations

1. "Genomic Signal Processing with Microarrays," A.O. Hero, 7th IEEE Intl Symp. on Signal Processing and its Applications, Paris, France, July 2003.

2. "Entropic graph theory and application," A.O. Hero, 3rd Workshop on Energy Minimization Methods and Computer Vision and Pattern Recognition, Lisbon, Portugal, July 2003.

3. "Signal Processing for Genomics," A.O. Hero, 6th IEEE/URSI Conference on Applications of Signal Processing, Beijing China, Aug. 2002.

4. "Statistical Signal Processing for Radio-nucleide Tomography," A.O. Hero, 1st IEEE Workshop on Sensor, Array and Multichannel Signal Processing, Boston MA, March 2000.

5. "Applications and Generalizations of the EM Algorithm," A.O. Hero, 19th Biennial Symposium on Communications, Kingston ON, Canada June. 1998.

Festschrift Presentations

1. "Parameter Estimation for Multi-dimensional Filtered Poisson Processes" A. O. Hero, Workshop to Honor Donald Snyder, St. Louis MO, Jan. 2000.

2. "Sur un problème d'estimation pour des processus de Poisson composeés et filtrés," (In French - English title, "On a problem of estimation for filtered composed Poisson processes") A. O. Hero, Colloque Picinbono, Paris, May 1999.

3. "CFAR Target Detection in Imaging Radar" , A. O. Hero, Irving Reed Symposium , Univ. Southern California, Los Angeles, Nov. 1998.

Conference Papers

1. "Location estimation accuracy in wireless sensor networks," N. Patwari and A. O. Hero, Proc. of IEEE Asilomar Conference on Signals, Systems and Computers, Pacific Grove, CA, Nov. 2002.

2. "Mathematical morphology applied for spot segmentation and quantification of gene microarray images," K. Siddiqui, A. O. Hero and M. Siddiqui, Proc. of IEEE Asilomar Conference on Signals, Systems and Computers, Pacific Grove, CA, Nov. 2002.

3. "Emission tomography from compressed list-mode data," T. Kragh and A. O. Hero, Proc. of IEEE Asilomar Conference on Signals, Systems and Computers, Pacific Grove, CA, Nov. 2002 (**Invited**).

4. "Gene filtering using posterior Pareto fronts," A. O. Hero and G. Fleury, Proc. of IEEE Asilomar Conference on Signals, Systems and Computers, Pacific Grove, CA, Nov. 2002 (**Invited**).

5. "Image registration using entropic graph-matching criteria," H. Neemuchwala, A. O. Hero and P. Carson, Proc. of IEEE Asilomar Conference on Signals, Systems and Computers, Pacific Grove, CA, Nov. 2002 (**Invited**).

6. "Posterior Pareto front analysis for gene filtering" (.pdf) , A. Hero and G. Fleury, Proc. of Workshop on Genomic Signal Processing and Statistics (GENSIPS), Raleigh NC, Oct 11-13 2002.

7. T. Kragh and A. O. Hero "Image resolution-variance tradeoffs using the uniform Cramèr-Rao bound", Proc. XI European Signal Processing Conference, Toulouse France, Sept 2002.

8. O. Michel and A. O. Hero "Entropic graph applications", Proc. XI European Signal Processing Conference, Toulouse France, Sept 2002.

9. "Pareto analysis for gene filtering in microarray experiments," G. Fleury, A. O. Hero, S. Yosida and A. Swaroop, Proc. XI European Signal Processing Conference, Toulouse France, Sept 2002.

10. "MIMO Channel Capacity for Secure Links," A. O. Hero and M. Godavarti, Proc. of URSI General Assembly, Maastricht, Aug. 2002.

11. "Recent Trends in Tomography for Large Scale Telecommunications Networks," A. O. Hero and C. Shih, Proc. of URSI General Assembly, Maastricht, Aug. 2002.

12. J. Li and A. O. Hero "A spectral approach to statistical polar shape modeling," Proc. of IEEE Int. Conf. on Image Proc., Rochester, NY, Oct 2002.

13. "Unicast based inference of network link delay distributions using mixed finite mixture models," M.-F. Shih and A. O. Hero, Proc. of IEEE Intl. Conf. on Acoust., Speech, and Signal Processing, Orlando, May 2002.

14. "Diversity and degrees of freedom in wireless communications," M. Godavarti and A. O. Hero, Proc. of IEEE Intl. Conf. on Acoust., Speech, and Signal Processing, Orlando, May 2002.

15. "Clustering Genetic Signals from Retinal Microarray Data," G. Fleury, A. O. Hero, S. Yosida and A. Swaroop, Proc. of IEEE Intl. Conf. on Acoust., Speech, and Signal Processing, Orlando, May 2002. (**Invited**)

16. "Connexions: DSP education for a networked world," Baraniuk, Richard and Burns, C. and Hendricks, B. and Henry, G. and Hero, A. and Johnson, D. and Jones, D. and Kusuma, J. and Nowak, R. and Odegard, J. and Potter, L. C. and Ramchandran, K., Proc. of IEEE Intl. Conf. on Acoust., Speech, and Signal Processing, Orlando, May 2002. (**Invited**)

17. "A characterization of the multivariate distributions maximizing Rényi entropy," J. Costa, A. O. Hero, and C. Vignat, IEEE Intl. Symposium on Inform. Theory, Laussane, June 2002.

18. "Convergence of differential entropies," M. Godavarti and A. O. Hero, IEEE Intl. Symposium on Inform. Theory, Laussane, June 2002.

19. "Multiple antenna acapacity in a deterministic Rician fading channel," M. Godavarti and A. O. Hero, IEEE Intl. Symposium on Inform. Theory, Laussane, June 2002.

20. "Feature Coincidence Trees for Registration of Ultrasound Images", H. Neemuchwala, A. O. Hero, P. L. Carson, AIUM 46th Annual Convention, Nashville, March 10-13, J. Ultras. Med., 21, S55, 2002.

21. "Image Registration: Breast Applications, Accuracy and Advanced Metrics", P.L. Carson, J.F. Kruecker, C.R. Meyer, G.L. LeCarpentier, J.B. Fowlkes, M.A. Roubidoux, H. Neemuchwala, and A.O. Hero, in Carson PL, Parker KJ, et al., Ultrasound Image Registration, Categorical Course, AIUM 46th Annual Convention, Nashville, March 10-13, J. Ultras. Med., 21, S73, 2002.

22. "MIMO capacity for Rician fading channels ," M. Godavarti and A. O. Hero, Proc. of Int. Union of Radio Sciences (URSI), Boulder CO, Jan. 2002.

23. "Alpha-divergence for feature pruning and indexing of biological databases," J. D. Gorman and A. O. Hero, Proc. of Int. Union of Radio Sciences (URSI), Boulder CO, Jan. 2002.

24. "Poisson emission tomography using compressed list mode data," T. Kragh and A. O. Hero, Proc. of Int. Union of Radio Sciences (URSI), Boulder CO, Jan. 2002.

25. "Insights into retinal development and aging using gene microarrays," Shigeo Yoshida, Jindan Yu, Rafal Farjo, Mohammad Othman, Alan Mears, Beverly Yashar, Sean MacNee, Matt Studt, Sujata Sheth, Alfred Hero, Debashis Ghosh, Todd Carter, David Lockhart, Carrolee Barlow, and Anand Swaroop, 9th Asian-Pacific Conference on Clinical Biochemistry, New Delhi India, 2002.

26. "Shape extraction and denoising via polar representations" J. Li and A. O. Hero, SIAM conference on Imaging Science, Boston, Sept. 2001 (**Invited**).

27. "Decentralized image compression and reconstruction for recognition tasks" R. Gupta and A. O. Hero, SIAM conference on Imaging Science, Boston, Sept. 2001 (**Invited**).

28. "alpha-divergence for image indexing and retrieval" A. O. Hero, Joint Statistical Meetings, Atlanta GA, Aug. 2001 (**Invited**).

29. "A Robust Bayesian Multisensor Fusion Algorithm For Joint Lane And Pavement Boundary Detection," B. Ma, S. Lakshmnanan and A. 0. Hero, Proc. of IEEE Int. Conf. on Intelligent Vehicles, Tokyo Japan, Oct 2001.

30. "Imaging Applications of Stochastic Minimal Graphs," Alfred Hero, Bing Ma and Olivier Michel, Proc. of IEEE Int. Conf. on Image Processing, Thessaloniki Greece, Oct 2001. (**Invited**)

31. "Feature coincidence trees for registration of ultrasound breast images," Huzefa Neemuchwala and Alfred Hero and Paul Carson, Proc. of IEEE Int. Conf. on Image Processing, Thessaloniki Greece, Oct 2001. (**Invited**)

32. "A spectral method for solving elliptic equations for surface reconstruction and 3D active contours" J. Li and A. 0. Hero, Proc. of IEEE Int. Conf. on Image Processing, Thessaloniki Greece, Oct 2001.

33. "Performance limits of hypothesis testing from vector quantized data," R. Gupta and A. O. Hero, IEEE Intl. Symposium on Inform. Theory, Washington DC, July 2001.

34. "Min-capacity of a multiple-antenna wireless channel in a static Rician fading environment," M. Godavarti, A. O. Hero and T. Marzetta, IEEE Intl. Symposium on Inform. Theory, Washington DC, July 2001.

35. "Stability anlaysis of the sequential partial update LMS algorithm", M. Godavarti and A. O. Hero, Proc. of IEEE Int. Conf. on Acoust. Speech and Sig. Proc. (ICASSP), Salt Lake City UT May 2001.

36. "Estimation of network link loss rates via chaining in multicast trees", A.-G. Ziotopoulos, A. O. Hero, and K. M. Wasserman Proc. of IEEE Int. Conf. on Acoust. Speech and Sig. Proc. (ICASSP), Salt Lake City UT May 2001.

37. "Unicast Inference of Network Link Delay Distributions from Edge Measurements," M-F Shih and A. O. Hero, Proc. of IEEE Int. Conf. on Acoust. Speech and Sig. Proc. (ICASSP), Salt Lake City UT May 2001. (Invited).

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174. "Alternatives to the generalized cross-correlator for time delay estimation," A.O. Hero and S.C. Schwartz, Proceedings of the IEEE 1984 International Conference on Acoustics, Speech and Signal Processing, pp. 15.4.1-15.4.4, San Diego, CA, April 1984.

175. "On the asymptotic form of level crossing probabilities," A.O. Hero and S.C. Schwartz, IEEE International Symposium on Information Theory, St. Jovite, Canada, Sept. 1983.

176. "A new generalized cross-correlator," A.O. Hero and S.C. Schwartz, Proceedings of the Seventeenth Annual Conference on Information Science and Systems, pp. 808-818, Baltimore, MD, March 1983.

Technical Reports:

1. "On computational cut-off rate for space-time coding," A.O. Hero and T.L. Marzetta, Bell Laboratories Technical Memo, Lucent Technologies, April 2000 (http://mars.bell-labs.com/cm/ms/what/mars/index.html).

2. "Kullback Proximal Algorithms for Maximum Likelihood Estimation," S. Chretien and A. Hero, RR-3756, INRIA Rhone-Alpes, Grenoble, France, Aug. 1999 (http://www.inria.fr/RRRT/publications-fra.html).

3. "Moments and moment matrices for invariant classification of noise contaminated spatial patterns," A.O. Hero, J. O'Neill and W.J. Williams, CSPL Technical Report 307, Mar. 1997.

4. "Maximal Invariant Theory Applied to Robust Detection of SAR/IR Targets," A.O. Hero and C. Guillouet, CSPL Technical Report 306, Jan. 1997

5. "Recursive algorithms for computing the Cramer-Rao bound," , A. O. Hero, M. Usman, Anne Sauve, and J. A. Fessler, CSPL Technical Report 305, Nov. 1996.

6. "Space-alternating generalized EM algorithms for penelized maximum-likelihood image reconstruction," J.A. Fessler and A.O. Hero, Tech. Report 286, Communications and Signal Processing Laboratory (CSPL), Dept. EECS, University of Michigan, Jan. 1994.

7. "Asymptotic convergence properties of EM-type algorithms," A.O. Hero and J.A. Fessler, Tech. Report 282, Communications and Signal Processing Laboratory (CSPL), Dept. EECS, University of Michigan, April 1993.

8. "A Cramer-Rao type lower bound for essentially unbiased parameter estimation," Technical Report 890, MIT Lincoln Laboratory, 1992.

9. "Simultaneous signal detection and classification under a false alarm constraint," A.O. Hero and J.K. Kim, Tech. Report 270, Communications and Signal Processing Laboratory (CSPL), Dept. EECS, University of Michigan, Oct. 1989.

10. "Lower bounds on parametric estimation with constraints," Tech. Report 269, Communications and Signal Processing Laboratory (CSPL), Dept. of EECS, University of Michigan, Aug. 1989.

11. "Timing estimation for filtered Poisson processes in additive Gaussian noise," A.O. Hero, Tech. Report 255, Communications and Signal Processing Laboratory (CSPL), Dept. EECS, University of Michigan, March, 1988.

12. "Information theoretic criteria for SPECT image reconstruction and aperture optimization," L. Shao and A.O. Hero, Tech. Report 261, Communications and Signal Processing Laboratory (CSPL), Dept. EECS, University of Michigan, Oct. 1988.

13. "Topics in time delay estimation," A.O. Hero, Tech. Report 16, Information Sciences and Systems Laboratory, Princeton University, Feb. 1985.

Book Chapters:

1. "Parameter Estimation for Multi-dimensional Filtered Poisson Processes," A.O. Hero, Donald L. Snyder Festschrift – J. O'Sullivan (Ed). Springer-Verlag, To appear June 2003.

2. "Signal Detection and Classification," A.O. Hero, The Digital Signal Processing Handbook, Madisetti and Williams (Eds.), CRC Press, pp. 13.1-13.14, 1998

3. "Telecommunications Media," A.O. Hero, Encyclopedia Britannica, pp. 493-500, 1997.

4. "Task specific criteria for adaptive beamforming with slow fading signals," A.O. Hero and R.A. Delap, Advances in Spectrum Analysis and Array Processing, vol. III, S. Haykin, Ed., pp. 352-401, 1995.

5. "A new generalized cross-correlator," A.O. Hero and S.C. Schwartz, in Coherence and Time Delay Estimation: An Applied Tutorial for Research, Development, Test, and Evaluation Engineers, G.C. Carter, Ed., IEEE Press, pp. 105-112, 1993.

6. "Level crossing representations, Poisson asymptotics and applications to passive arrays," A.O. Hero and S.C. Schwartz, Stochastic Processes in Underwater Acoustics, C. Baker, Ed., pp. 95-121, Springer-Verlag, New York, 1986.

Book Reviews:

"Radar Data Processing: Vol. 1 - A. Farina and F.A. Studer," IEEE Trans. Acoustics, Speech and Signal Processing, Vol. ASSP-34, pp. 1350-1352, Feb. 1987.

Current Research Grants:

1. "Sequential adaptive multimodality target detection and classificcation using physics-based models," DARPA-MURI, $1,300,000, 07/01-07/06. P.I.: A. Yagle.

2. "Multi-modality Image Registration," National Institutes of Health, P01, $5,000,000, 05/01-05/06. P.I.: C. Meyer.

3. "Signal Detection for single-spin magnetic force microscopy," sub-contract to IBM, under DARPA MOSAIC project award, $360,000, 06/02-12/03. P.I.: A.O. Hero.

4. "Application and analysis of minimal graphs for information and divergence estimation," Collaborative Linkage Grant, NATO, 8/1/00-7/31/01, $25,000. Project Coordinator from NATO: O. Michel, Project Coordinator from Israel: Y. Francos, Project Coordinator from US: A. Hero.

5. "Radionucleides: radiation detection and quantification," National Institutes of Health RO1-CA32846. 6/1/02-5/31/05, $1,000,000. P.I.: N. Clinthorne.

Past Research Grants:

1. "Techniques for calculating tumor dosimetry," National Institutes of Health RO1-CA87955-01, 6/1/00-5/30/04, $300,000. P.I. K. Koral.
2. "Challenges in Pattern Recognition," National Science Foundation, , $30,000, 03/02-09/02. P.I.: A.O. Hero.
3. "Low-energy electronics design for mobile platforms," Army Research Office DAAH04-96-1-0337, $5,000,000, 9/1/96-8/31/01, P.I. W. Stark.
4. "Radionucleides: radiation detection and quantification," National Institutes of Health RO1-CA32846. 3/1/94-2/28/02, $842,259. P.I.: W.L. Rogers.
5. "Automated Target Recognition," Air Force Office of Scientific Research F49620-96-0028, $351,000, 11/1/95-7/30/01. P.I.: A.O. Hero.
6. "Detection and resource allocation problems in ATR systems," Air Force Office of Scientific Research AASERT F49620-98-0370, $183,000, 4/1/98-3/31/01. P.I. A.O. Hero.
7. "Robust automatic multimodality registration," National Institutes of Health, 4/1/97-3/31/00, $486,931. P.I. C. R. Meyer.
8. "Estimation strategies for nuclear medical imaging," National Institutes of Health RO1CA54362, 3/1/95-2/28/00, $1,174,533. P.I.: W. L. Rogers.
9. "Space-Frequency Image Processing," National Security Agency MDA904-95-C-2157 , 6/1/95-11/31/96, $195,000. P.I.: W.J. Williams.
10. "Cellular Network Modeling and Simulation for the Study of Cardiac Function," UM OVPR Research Partnership Award, 5/1/94-4/30/95, $14,214. P.I.: A.O. Hero.
11. "Optimizing information transfer characteristics of tomographic imaging systems," National Science Foundation, BCS-9024370, 5/1/91 - 4/30/95, $185,030. PI: A. O. Hero.
12. "Computation of content information and time frequency of biological signals," $17,686, UM OVPR 1992. P.I.s: W. J. Williams and A. O. Hero.
13. "An integrated environment for image reconstruction and visualization," IBM/CAEN Distributed Computing Initative, 3 IBM RS/6000 workstations awarded, 5/20/91. P.I.s: A. O. Hero and D. J. Anderson.
14. "Improving coincidence timing for positron imaging," National Institutes of Health: R01 CA46622-01, 3/1/88 - 9/1/91, $650,785. P.I.: N.H. Clinthorne.
15. "Engineering research equipment grant: array processing equipment for communications and signal processing research," $162,854, National Science Foundation. P.I.: W.E. Stark.
16. "Large deviations in delay estimation: models and alternatives," The University of Michigan Rackham School of Graduate Studies, 1/85-9/86,$10,000. P.I.: A.O. Hero.

SERVICE:

Professional Service

Guest Editor (w/ R. Riedi, I. Norris, A. Petropolu), Special Issue on Signal Processing for Networking, IEEE Transactions on Signal Processing, Sept. 2003

US Liason, European Signal Processing Conference, Toulouse, France, Sept. 2002.

Chair for Signal Processing Technical Track, Asilomar Conf on Signals, Systems, and Computers, Pacific Grove CA, Nov., 2002.

Chair, Commission C of US Commission of International Union of Radio Sciences (URSI), 2000-2002

Vice President – Finance, IEEE Signal Processing Society, 2000-2002

Member, Executive Committee, IEEE Signal Processing Society, 2000-2002

Member, Board of Governors, IEEE Signal Processing Society, 2000-2002

Member, Signal Processing Theory and Methods Technical Committee, IEEE Signal Processing Society, 1999-2002

Member Conference Board, IEEE Signal Processing Society, 1992-2002

Member Publications Board, IEEE Signal Processing Society, 2000-2002

Member, Technical Directions Committee, IEEE Signal Processing Society, 1996-1998

Guest Editor (w/ H. Krim), Special Issue on Mathematical Imaging, IEEE Signal Processing Magazine, Oct. 2002

Guest Associate Editor (w/ R. Nowak and A. Petropolu), Special Issue on Network Measurements, IEEE Signal Processing Magazine, May 2002

Guest Associate Editor (w/ D. Snyder, P. Moulin, J. O'Sullivan), Special Issue on Information Theoretic Imaging, IEEE Transactions on Information Theory, 1999-2001

Guest Editor, IEEE Signal Processing Magazine, Special Issue on Statistical Signal and Array Processing, 1996

Associate Editor, IEEE Transactions on Information Theory, 1994-1998.

Treasurer, IEEE Signal Processing Society Conference Board, 1996-1999.

Chairman, Statistical Signal and Array Processing Technical Committee, IEEE Signal Processing Society, 1996-1998

Chairman, Ad Hoc Task Force for Restructuring Signal Processing Society, 1998

Vice Chair, Commission C, US National Council, Intl. Union of Radio Sciences (URSI), 1997-2000

General Chairman, 1995 IEEE International Conference on Acoustics, Speech, and Signal Processing, Detroit, 1995.

Co-Chair, 1999 IEEE Workshop on Higher Order Statistics, Caesaria ISRAEL, June 1999.

Co-Chair, 1999 IEEE Workshop on Information Theory, Santa Fe, Feb. 1999.

Program committee member, IEEE Nuclear Science Symposium and Medical Imaging Conference, San Francisco, 1994 -

Program committee member, SPIE Int. Symposium on Optical Science, Engineering, and Instrumentation, San Diego, 1998

Chairman for Publicity, 1986 IEEE International Symposium on Information Theory.

Member Education Committee, IEEE Signal Processing Society, 1993-1995

Service to Government Agencies

Member, Sensors and Electronic Devices (SED) Panel, National Research Council (NRC), 2002-2005.

Co-Chair, NSF/DARPA Workshop on Genomic Signal Processing and Statistics (GENSIPS), Oct. 2002.

Chair, NSF Workshop on Challenges in Pattern Recognition, Mar. 2002.

Member, NSF CAREER Panel, Nov. 2001.

Member, DARPA Multi-User Detection Study Group, April-July 2000.

Member, NSF Advisory Panel for Interfaces between Signal Processing and Statistics, 1995.

Panelist NSF (1994, 1998, 2001)

Special Study Section member NIH (1992, 1993, 1996, 1997, 1998)

Service to University of Michigan

Graduate Counselor, Signal Processing Program, Dept. EECS, 2001-

Member, ECE Faculty Search Committee, Dept EECS, 2002-2003

Member, College of Engineering EECS Chair Search Committee, 2001-2002

Member, EECS Awards Committee, 2000-2001

Member, EECS Executive Committee, 2000-2002

Member, EECS-EES Graduate Committee, 2000-2002

Member, Faculty Search Committee for Communications and Signal Processing, 2000-2001

Member, Departmental Computing Organization (DCO), 1999-2000

Member, Rules Committee of the Faculty Senate, 1997-2003.

Co-Chair of Admissions, Systems Division Graduate Program, 1997-.

Director, Communications and Signal Processing Laboratory (CSPL) 1996-2000.

Chair, College Rules Committee, College of Engineering 1996-1997.

Chair, Signal Processing Processing Area, 1991-1996

Chair, Faculty Search Committee for Signal Processing, 1994-1996, 1999-2000.

Member, College of Engineering Faculty Discipline Committee, 1993-1998.

Member, EECS Executive Committee, 1990-1992.

Member, Blue Ribbon Committee for EECS Undergraduate Curriculum, 1991-1992.

Member, EES Graduate Committee, Sept. 1985-1990, 2000-.

Member, Systems Division Executive Committee, 1988-1989.

Graduate Advisor for Signal Processing Program, Systems Division, 1985-1990.

Member, EES Graduate Financial Aid Committee, 1987-1990.

Member, Systems Division Seminar Committee, 1987, 1988, 1990, and 1991.

MEMBERSHIPS IN PROFESSIONAL SOCIETIES

The Institute of Electrical and Electronic Engineers (IEEE), Fellow (1998)

The American Statistical Association (ASA), Member

The Society for Industrial and Applied Mathematics (SIAM), Member

The International Union of Radio Science (URSI), Commission C, Member

Tau Beta Pi, Member

HONORS AND AWARDS:

Keynote or Plenary speaker engagements: 3-rd Workshop on Energy Minimization Methods in Computer Vision and Pattern Recognition(Lisbon, 2003); IEEE 5th International Symposium on Signal Processing and its Applications (Paris, 2003); IEEE/URSI 6th International Conference on Applications of Signal Processing (Beijing 2002); 19th Biennial Symposium on Communications (Kingston 1998); IEEE 1-st Workshop on Sensors, Arrays and Multichannel Signal Processing (Boston 2000).

Distinguished Lecturer, IEEE Signal Processing Society, 2002.

IEEE Third Millenium Medal recipient, 2000

Best Paper Award, IEEE Signal Processing Society 1998

Meritorious Service Award, IEEE Signal Processing Society, 1998.

Fellow of IEEE, 1997.

Research Excellence Award, Dept. of EECS, The University of Michigan, 1995.

O.D. Munn University Fellowship in Electrical Engineering (Princeton), 1980.

G.V.N. Lothrop Fellowship in Engineering (Princeton), 1983.