

GONZALO R. ARCE

RESEARCH INTERESTS

Nonlinear signal and image processing, wireless communications, statistical signal processing, electronic imaging, computer networking.

PROFESSIONAL EXPERIENCE

2004 - Present University of Delaware Newark, DE 19716
**Charles Black Evans Distinguished Professor
and Chairman,** Department of Electrical and Computer Engineering

2000 - 2004 University of Delaware Newark, DE 19716
Professor and Chairman, Department of Electrical and Computer Engineering

1996 - 1999 University of Delaware Newark, DE 19716
Professor and Associate Chair, Department of Electrical and Computer Engineering

1999 Tampere University of Technology, Tampere, Finland
Visiting Professor, International Center for Signal and Image Processing

1992 - 1996 University of Delaware Newark, DE 19716
Professor, Department of Electrical and Computer Engineering

1984 - 2002 University of Delaware Newark, DE 19716
Adjunct Professor, College of Marine Studies

1987 - 1992 University of Delaware Newark, DE 19716
Associate Professor, Department of Electrical Engineering

1985 Unisys Corporate Research Center Reston, VA
Visiting Member of Technical Staff

1982 - 1987 University of Delaware Newark, DE 19716
Assistant Professor, Department of Electrical Engineering

EDUCATION

1980 - 1982 Purdue University West Lafayette, IN
PhD Electrical Engineering

1979 - 1980 Purdue University West Lafayette, IN
MSEE Electrical Engineering

1976 - 1979 University of Arkansas Fayetteville, AR

B.S. Electrical Engineering Summa Cum Laude

HONORS AND AWARDS

IEEE Fellow for “Contributions to the theory and applications of nonlinear signal processing.”
Fellow, Center for Advanced Studies. University of Delaware, 1998, 1999.
DuPont Education Award, 1998, 1999, 2002.
ARL ATIRP Federated Laboratory Symposium Best Paper Award, 1997
Whitaker Scientific Paper Award, 1995
ASPE Teaching Fellow, 1992
Sperry Corporation University Research Award, 1985
National Science Foundation *Research Initiation Award*, 1983
1979 University of Arkansas, College of Engineering Scholar
1977, 1978 Eta Kappa Nu *Achievement Award*
1977 Outstanding Engineering Sophomore

PROFESSIONAL SOCIETIES AND ACTIVITIES

The Institute of Electrical and Electronics Engineers (IEEE)

IEEE Society on Signal Processing

- *IEEE Fellow*
- Tutorials Chair, International Conference on Acoustics, Speech, and Signal Processing, 2005
- *Co-Chair*, Nonlinear Signal and Image Processing Workshop, 2001
- *Associate Editor*, IEEE Transactions on Signal Processing, 1999-2003
- *Associate Editor*, IEEE Transactions on Acoustics, Speech, and Signal Processing, 1991-1996
- *Guest Editor* of the IEEE Transactions on Image Processing, 1995-1996
- Program Committee, Workshop on Nonlinear Digital Signal Processing, 1993, 1995, 1997
- Program Committee, International Conference on Image Processing, 1994, 1998
- Program Committee, ICASSP, 1994
- Technical Committee Chair, MicroDelcon Conference, 1983
- Student Chapter Advisor, 1985-1993

IEEE Circuits and Systems Society

- Member, Technical Committee on Digital Signal Processing, 1985-1999
- Program Committee, Midwest Symposium on Circuits and Systems, 1989
- Program Committee, International Symposium on Circuits and Systems, 1997

Nonlinear Signal and Image Processing Board

- Board *Founding Member*
- Program Committee Member, NSIP 1993, 1995
- General Co-Chair, NSIP Workshop 2001

Society of Photographic and Instrumentation Engineers

- General Co-Chair, International Symposium on Computers and Information Technology (IT COM 2002), July 2002
- Conference Co-Chair, Symposium on Nonlinear Electronic Imaging, 1990, 1991
- Lecturer, Short Course on Nonlinear Image Processing 1990

European Association of Signal and Image Processing (EURASIP)

- Editorial Board Member, EURASIP Journal on Applied Signal Processing, 2001 – 2005.
- Editor In Special Issue of JASP, Nonlinear Signal Processing and Applications, Dec. 2001
- Editor In Special Issue of JASP, Nonlinear Signal Processing and Applications, Feb. 2002
- Program Committee, European Signal and Image Processing Conference, 1997, 2000

Optical Society of America

- *Guest Editor* of Optics Express, 1998

BOARDS AND PANELS

- External Advisory Board, College of Engineering, University of Central Florida, 2004
- Image Science and Technology (IS&T), Advisory Board Member, 1998, 1999, 2001
- Advisory Board, EM Photonics.
- Advisory Board, ETI Inc.
- Army's Telecommunications and Information Distribution (ATIRP) Federated Laboratory Consortium Management Board, 1997-1998
- National Science Foundation, Review panel for Microelectronics and Information Processing Division 1986, 1988, 1995, 2000
- National Science Foundation, Review panel for the Small Business Innovation Awards, 1994
- Canada Research Office, Review panel for the Postdoctoral Awards Program, 1996
- University IDEAS, Bogotá Colombia, Scientific Advisory Board Member, 1997
- Chair, Panel on Signal Processing for Heavy Tailed-Distributions, 1998

PH D DISSERTATION SUPERVISION

1. Yinbo Li, in progress.
2. Ren Wei Ge, "N-ary approximate authentication codes and their applications in secure communications," in progress.
3. Liangping Ma, "Signal processing analysis and algorithms for internet congestion control," 2005.
4. Karen Bloch, "Signal analysis methods for biological data," 2004. Now with DuPont.
5. Sebastian Hoyos, "Mixed signal high speed processing solutions for broadband systems and technologies," 2004. Now with the University of California at Berkeley.
6. Zhi Zhou, "Advances on digital video and visual cryptography," 2004. Now with Samsung Research.
7. Caesar Nino, "New imaging technologies in halftoning: data hiding, color modeling and color matching," 2002. Now with DuPont.
8. Jose Luis Paredes, "New robust signal processing tools for multimedial and communications," Aug. 2001. Faculty Member at the University of Los Andes, Venezuela
9. Alexander Flaig, "Nearfield spot-beamforming," Aug. 2000. Now with Texas Instruments.
10. Liehua Xie, "Authentication codes and watermarking for multimedia communications in

- lossy networks,” May 2000. Now with Eye Cast.
11. Daniel L. Lau (N. C. Gallagher co-supervisor), “Modern digital halftoning,” May 1999. Now with the faculty at the University of Kentucky.
 12. Sudhakar Kalluri, “Nonlinear adaptive algorithms for robust signal processing and communication in impulsive environments,” Dec. 1998. Now with Intel.
 13. Juan G. Gonzalez, “Robust technologies for wireless communications in non-gaussian environments,” (Winner of the *Allan P. Colburn Best Dissertation Award* as the most outstanding doctoral dissertation in engineering, mathematics, and computer sciences), May 1997. Now with Lucent Bell Laboratories.
 14. David E. Griffith, “Robust time-frequency representations for signals in alpha-stable noise: methods and applications,” December 1997. Now with NIST.
 15. Edwin A. Heredia, “A piecewise polynomial theory for nonlinear signal processing,” May 1996. Now with Microsoft.
 16. Yeong T. Kim, “Permutation and combination filter lattices and their applications in nonlinear signal processing,” Aug. 1993. Now with Samsung Research Center.
 17. Timothy Hall, “Permutation and combination weighted order stastic filters for image processing,” May 1994. Now with NIST.
 18. Martin Mueller, “Tomographic algorithms and synthetic detector arrays,” May 1993. Now with Siemens Corp.
 19. Kenneth E. Barner, “Permutation filters: a new group theoretic class of non-linear filters” (Winner of the *Allan P. Colburn Best Dissertation Award* as the most outstanding doctoral dissertation in engineering, mathematics, and computer sciences), May 1993. Faculty at the University of Delaware.
 20. Shoupu Chen, “Micro-structured adoptive filter theory for robust signal processing,” May 1992. Now with Kodak Research.
 21. David C. Brown (C. Ih co-supervisor), “Scene segmentation and definition for autonomous robotic navigation using structured light processing,” May 1989. Now with the Army Research Laboratories.

M.S. THESIS SUPERVISION

1. Y. Ma, “New packet delay network protocols based on robust signal processing,” in progress.
2. J. Bacca, “Spectral design of weighted median filters: a general iterative approach,” 2003.
3. F. Faheem, “Digital multitoning using gray level separation,” Dec. 2002.
4. A. Khan, “Stochastic moiré,” Dec. 2002.
5. S. Hoyos, “Mixed-signal architectures for printed circuit board channels,” Aug. 2001.
6. C. Nino, “Data embedding in digital halftones with screen mask codes,” May. 2000.
7. S. Hasan, “Elimination of interference terms of discrete wigner distribution using nonlinear filtering,” 1999.
8. Y. Berananda, “Adaptive myriad filters for image processing in alpha-stable impulsive noise,” 1999.
9. J. Paredes, “Stack filters, stack smoothers, and mirrored threshold decomposition,” 1998. Faculty Member at the University of Los Andes, Venezuela.

10. L. Xie, "Watermarking digital image signatures for authentication," 1998. Now with Eye Cast.
11. A. Flaig (K. Barner co-supervisor), "Affine-order-statistic filters: medianization of linear FIR filters," 1998.
12. F. Strobel, "Wavelet encoded zero tree compressed still image transmission using a partial reliability/partial order transport protocol," (Technical University Uhlm FHTE), May 1997.
13. H. Cui (N. C. Gallagher co-supervisor), "The development of a simulator for neuromorphic circuits," Fall 1996.
14. Y. Kim (A. Khayrallah co-supervisor), "Nonlinear filters in robust data compression of speech signals," 1996.
15. A. Flaig, "Fuzzy order-statistics," (Technical University Aalen FHTE), 1996.
16. P. Zurbach, "Weighted myriad filters for image processing," June, 1996.
17. L. Li, "Detection of evoked potentials as a method for brain computer interfacing," May 1996.
18. J. Gonzalez (K. Barner co-supervisor), "A new approach to suppressing abnormal tremor through signal equalization," 1995.
19. D. Griffith, "Partially decoupled volterra filters: formulation and adaptive algorithms," 1994.
20. M. Tian, "Transform domain adaptive order stastic based filters," Aug 1994.
21. W. Reynolds, "Micro-statistics in adaptive antenna arrays," Aug. 1992.
22. R. Hardie, "Ranking multivariate data and its use in color image estimation," May 1990.
23. K. Barner, "Optimal detection schemes for the restoration of images with signal dependent noise," Dec. 1989.
24. T. Hu, "Applications of subband decomposition to data compression," Dec. 1989.
25. R. Feehs, "Optimal detection approaches to image restoration: signal independent noise," Dec. 1989.
26. R. Foster, "Algorithms architectures and the VLSI implementation of ranked-order filters for multidimensional signal processing," May 1988.
27. T. Rao, "Fourier based analysis of ordered dither halftoning," Dec 1988.
28. S. Fontana, "Temporal ranked filters for stationary and motion compensated imagery," Dec. 1986.
29. M. Mc Loughlin, "Deterministic properties of two-dimensional medial type filters," Dec.1985.
30. R. Crinon, "Theoretical analysis of the median filtering of impulse type noise," May 1984.
31. J. Dalton, "Visual model based image halftoning using markov random field error diffusion," Dec. 1984.

National Science Foundation, with D. Mills, "Diffusion mechanisms for Internet congestion control," \$330,000, 2004-2007.

Intel, with D. Prather, "Advanced super-resolution lithography," \$200,000, 2004-2005.

Agere, "HVS Model-based halftoning," \$177,000, 2004-2005.

Dupont, "Bioinformatic signal processing," \$20,000, 02-03.

Army Research Laboratory, "Collaborative Technical Alliance in networks and communications," with 8 faculty in ECE and CIS, \$4 million, 2001 – 2006.

Battelle, with F. Kiamilev, "Power-saving communication protocols for VCSEL arrays," \$24,000, 9/01-9/02.

Raytheon Systems Co., with F. Kiamilev, "Raytheon A.C.N. Project," \$44,000, 5/00-9/01.

Telcordia Technologies, "Collaborative Technology Alliance Consortium Phase II(Task 3.3)," with C. Boncelet, \$72,000, 5/01-9/06.

Telcordia Technologies, "Collaborative Technology Alliance Consortium Phase II(Task 2.1)," with C. Charles Boncelet, \$86,000, 5/01-9/06.

PMC-Sierra, Inc., "Signal processing for internet technology," \$35,000, 3/00-2/02.

Lexmark International, Inc., "Advances in Color and green noise halftoning for electronic imaging," \$30,000, 6/00-5/02.

Army Research Laboratory, "Advanced Telecommunications/Information Distribution Research Federated Laboratory," with 6 faculty in ECE and CIS, \$ 3.5 million, (G. Arce's portion: \$875,000), 1996 - 2001.

DE Research Partnership, "Delaware Research Partnership Program," \$54,000.00, 1/01-6/02.

EI Dupont De Nemours, "Digital halftoning for prepress technologies," \$66,000.00,

DARPA ITO (with F. Kiamilev), "Low power communication protocols for high speed cross switchers," \$200,000, 10/00 – 9/01.

Du Pont iTechnologies, "Halftoning research and implementation," \$80,000, 6/01 – 6/02.

Direct Radiology Corporation (with K. Barner), "Denoising and contrast enhancement of digital X-rays," \$100,000, pending.

Lexmark International, "Internet imaging software," \$80,000, 2000-2001.

Direct Radiology Corporation (with K. Barner), "Digital processing of X-ray imagery" \$5,000, 1999.

AANETCOM, "Signal processing for gigabit Ethernet," \$90,000, 1999-2000.

Lexmark International, "Green noise halftoning masks," \$27,000, 1999.

Du Pont, "Digital image watermarking," \$25,000, 1998-1999.

National Science Foundation, "Parallel and distributed computing," with 8 faculty in ECE and CIS, \$900,000, 1997 - 2001.

National Science Foundation, "Weighted myriad filters and their application to communications," \$310,000, 1996 - 2000.

Army Research Laboratories, "Robust Viterbi decoders," \$30,000, 1998-1999.

National Science Foundation, "Research Experiences for Undergraduates," \$10,000, 1997 -

1998.

Army Research Laboratory, "Telecommunications/Information Distribution Research Federated Laboratory," with 6 faculty in ECE and CIS, \$ 3.5 million, 1996 - 2001.

Silicon Graphics (with N. C. Gallagher, K. Barner, C. Boncelet), " Multimedia equipment for Instruction and research," \$420,000, 1995 - 1996.

National Science Foundation, "Video signal processing research," with C. Boncelet, et al, \$ 100,000, 1994 - 1995.

National Science Foundation, "Microstatisc signal decomposition and the optimal filtering problem," \$130,000, 1991 - 1993.

ALCOA, " Three dimensional computerized tomography with truncated projections," \$95,000, 1990 - 1992.

Sperry Corporation, `` Multidimensional signal processing and computer vision," \$30,000, 1986 - 1987.

Du Pont, "Data compression methods in process control," \$28,000, 1987 - 1988.

Du Pont and The Delaware Research Partnership, "Visual communications of computer networks,"\$57,000, 1989 - 1990.

Unidel Foundation, " A Computer Vision and Image Processing Laboratory," \$170,000, with P. Warter and C. Boncelet, 1986 -1987.

University of Delaware Research Foundation, "Analysis of Two Dimensional Median Filters," \$15,000, 1983 - 1984.

National Science Foundation, Research Initiation Grant, "Theoretical analysis of recursive median filters," \$55,000, 1983 – 1985.

UNIVERSITY, COLLEGE AND DEPARTMENT SERVICE

College and University

- Technology Management M.S. Program Development, College of Business and Economics, 2001.
- ABET Review Preparation Committee, 1999.
- Chair, Chemical Engineering Chair Search Committee, 1995.
- Engineering Dean Search Committee, 1998-1999.
- EG Staff Merit Committee, 1999.
- EG Computer Infrastructure Committee, 1997.
- Colburn Dissertation Award Committee, 1994.
- College of Marine Studies, Faculty Search Committee, 1986.
- EG Undergraduate Mathematics Curriculum Committee, 1985.

Electrical and Computer Engineering

- Faculty Search Committee, 1983, 1995, 1988, 1989, 1992, 1995, 1996, 1997.
- UG Computer Engineering Program Development, 1996.
- Chair, ECE Departmental Promotion and Tenure Committee, 1991, 1996, 1997, 1998.
- Co-founder Esslingen/Udel Graduate Student Exchange Program, 1999.
- Member, Graduate Program Committee 1991 - 1999.
- ECE Web Site Organization, 1996 - 1999
- ECE Space Committee, 1998 - 1999.

- Engineering Outreach - ELEG636 Statistical Signal Processing 1995 - 1999.
- ECE Graduate Program Revision, 1991.

CONSULTING

- Agere, Halftoning, 2004-2005.
- Samsung, "Digital Video," 2002-2005.
- Information Holdings Corp., "Digital Halftoning," 2001-2002.
- Videoquilt, "Mosaic Imaging," 2001.
- Du Pont, "Bioinformatics," 2001-2002.
- Samsung, "HDTV," 2000 – 2002.
- Army Research Laboratories, "Optimal sequence decoding," 1998 - 1999.
- AANETCOM, "Adaptive equalization of Ethernet transceivers," 1998 - 1999.
- Xionics, "Inverse halftoning," 1997.
- Levien Inc., "Digital printing," 1995 -1996.
- Hewlett Packard, "Blue noise mask halftoning," 1995 - 1997.
- ARL/CECOM, "Signal processing education," 1997.
- Alcoa, "Computerized tomographic arrays," 1990 - 1992.
- BBA Banking Corporation, "Communications," 1990 - 1992.
- Sperry Corporation, "Image processing," 1985 - 1986.
- Du Pont, "Process control data compression," 1986 - 1988.

BOOKS

1. **G. R. Arce**, "*Nonlinear Signal Processing*," Graduate level textbook in preparation.
2. K. Barner and **G. R. Arce**, editors, "*Nonlinear Signal and Image Processing*," CRC Press, to appear 2003.
3. D. Lau and **G. R. Arce**, "*Modern Digital Halftoning*," Marcel Dekker, New York, 2001.

BOOK CHAPTERS

1. K .M. Bloch and **G. R. Arce**, "Analyzing Protein Sequences using Signal Analysis Techniques," "*Computational and Statistical Approaches to Genomics*", (W. Zhang and I. Shmulevich, ed.), pp. 113-124, Kluwer Academic Publishers, 2002.
2. **G. R. Arce**, J. L. Paredes, J. Bacca, "Nonlinear Filtering for Image Analysis and Enhancement," to appear in A. Bovik, ed. "*Handbook of Image and Video Processing*," Academic Press. 2005.
3. **G. R. Arce**, G. D. Crescendo, Z. Zhao "Visual Cryptography," in "*The Handbook of Image and Video Processing*," Second Edition.
4. Y. Li and **G. R. Arce**, "Multichannel Weighted Median Filters," a chapter in *Advances on Nonlinear Signal and Image Processing*, ed. S. Marshall and G. Sicuranza, Hindawi Publishing Corporation, 2005
5. **G. R. Arce**, J. G. Gonzalez and Y. Li, "Weighted Myriad Filters," Chapter 5 in *Nonlinear Signal and Image Processing: Theory, Methods, and Applications*, ed. K. E. Barner and G. R. Arce, CRC Press, Nov. 2003

6. **G. R. Arce**, G. D. Crescendo and Z. Zhou, "Visual Cryptography" in *The handbook of image and video processing*, 2nd edition, A. Bovik, Editor, Academic Press, 2005
7. **G. Arce**, D. Lau and C. Nino, "Stochastic Dithering and Watermarking," in *Nonlinear Signal and Image Processing*, eds. K. E. Barner and G. R. Arce, CRC Press, Nov. 2003
8. L. Russo, J. Paredes, and **G. R. Arce**, "Multichannel image compression and denoising using bijection mappings," "ATIRP Research Advances, UMD Press 2002.
9. **G. R. Arce** and J. Paredes, "Image enhancement with weighted medians," Invited Chapter in "*Nonlinear Image Processing*," S. Mitra and G. Sicuranza, Editors, pp 27-67, Academic Press, 2000.
10. **G. R. Arce**, J. Paredes, "Recent developments in stack filtering and smoothing," in *Advances in Imaging and Electron Physics*, P. W. Hawkes, Editor, Academic Press, 2001.
11. D. Lau and **G. R. Arce**, "Digital Halftoning," "Invited Chapter in "*Nonlinear Image Processing*," S. Mitra and G. Sicuranza, Editors, Academic Press, 2000.
12. **G. R. Arce**, J. Paredes, and J. Mullan, "Image Enhancement and Analysis Using Nonlinear Filters," in *Handbook of Image Processing*, A. Bovik, Editor, Academic Press, 1999.
13. **G. R. Arce**, Y. T. Kim, and K. E. Barner, "Order statistic filtering and smoothing of time series: Part I," Invited chapter in the *Handbook of Statistics 16 Order Statistics and Their Applications*, C. R. Rao and N. Balakrishnan, Editors, 1999.
14. K. E. Barner and **G. R. Arce**, "Order statistic filtering and smoothing of time series: Part II," Invited paper to appear in the *Handbook of Statistics 16 Order Statistics and Their Applications*, C. R. Rao and N. Balakrishnan, Editors, 1999.
15. **G. R. Arce** and K. E. Barner, "Nonlinear Signal Processing," Invited chapter in the *Encyclopedia of Electrical and Electronics Engineering*, J. G. Webster, Editor, Wiley, 1999.
16. **G. R. Arce** and R. Foster, "Detail preserving ranked order based filters for image processing," in *Digital Image Processing*", R. Chellappa ed., IEEE Press, 1992.
17. **G. R. Arce** and N. C. Gallagher, "BTC image coding using median filter roots," in *Bloch Truncation Coding*, IEEE Press, 1994.
18. **G. R. Arce**, T. Nodes, and N. C. Gallagher, "Median Filters: Theory for One and Two Dimensional Filters," in *Advanced Topics in Signal Processing*, T. S. Huang ed., JAE Press, 1986.

PATENTS

1. K. M. Bloch and **G. R. Arce**, "Time-Frequency Analysis of Protein Sequence Data," Provisional patent application filed March 29, 2001. Utility application to be filed by March 29, 2002.
2. S. Hoyos, B. Sadler, and **G. R. Arce**, "Analog to Digital Conversion based on Signal Projection over Orthogonal Spaces," US Patent Pending.
3. K. Bloch and **G. R. Arce**, "Method of Non-Linear Analysis of Biological Sequence Data," US Patent 6,728,642, April 27, 2004.
4. S. Hoyos, B. Sadler, and **G. R. Arce**, "Broadband Multicarrier Communication Receiver Based on Analog to Digital Conversion in the Frequency Domain," US Patent Pending.
5. Z. Zhou, Yeong Taeg Kim, and **G. R. Arce**, "Method and System of Noise-Adaptive Motion Detection in an Interlaced Video Sequence", US Patent Pending

6. M. Mueller and **G. R. Arce**, "Tilted Detector Microscopy in Computerized Tomography," US Patent 5,493,593, February 20, 1996.
7. M. Mueller and **G. R. Arce**, "Cone Beam Synthetic Arrays in Three Dimensional Computerized Tomography," US Patent 5,740,224, April 14, 1998.
8. **G. R. Arce** and D. Lau, "Method and Apparatus for Producing Halftone Images Using Green Noise Masks having Adjustable Coarseness," US Patent 6,493,112, December 10, 2002.
9. D. Lau, **G. R. Arce**, and N. Gallagher, "Generalized Color Error Diffusion," US Patent Pending.
10. X. Xia, C. Boncelet, and **G. R. Arce**, "Watermarking Methods for Digital Images and Videos," US Patent 6,556,689, April 12, 2003.
11. L. Xie, A. Lewis, A. Michelson, E. Basch, **G. R. Arce**, "Message Authentication Code Using Image Histograms," US Patent 6,606,393, August 12, 2003.
12. L. Xie, A. Lewis, E. Basch, **G. R. Arce**, "Message Authentication Code with Improved Error Tolerance," US Patent 6,665,420, December 16, 2003.
13. L. Xie, A. Lewis, E. Basch, **G. R. Arce**, "Systems and Methods for Etching Digital Watermarks," US Patent 6,542,836, January 28, 2003.

JOURNAL PUBLICATIONS

1. Y. Li, **G. R. Arce**, J. Bacca, "Generalized vector medians for correlated channels," to be submitted to the IEEE Transactions on Signal Processing, 2004.
2. S. Hoyos, Y. Li, J. Bacca, **G. R. Arce**, "Spectral design of weighted median filters: A General Iterative Approach," Signal Processing, IEEE Transactions, 53, issue: 3, pp. 1045-1056, March 2005.
3. K. M. Bloch, **G. R. Arce**, "Median Correlation for the Analysis of Gene Expression Data," *Signal Processing*, 83, pp. 811-823, Feb. 2003.
4. L. Ma, K. Barner, **G. R. Arce**, "Statistical Analysis of TCP's Retransmission Timeout Algorithm," submitted to IEEE/ACM Transactions on Networking (under second review).
5. L. Ma, **G. R. Arce**, K. Barner, "TCP Retransmission Timeout Algorithm Using Weighted Medians," IEEE Signal Processing Letters, 11, 6, pp. 569-572, June, 2004.
6. **G. R. Arce**, K. Barner, L. Ma, "Red Gateway Congestion Control Using Median Queue Size Estimates," IEEE Transactions on Signal Processing, 51, 8, pp. 2149-2164, August, 2003.
7. Z. Zhou, **G. R. Arce** and G. D. Crescendo, "Halftone Visual Cryptography," submitted to the IEEE Transactions on image processing.
8. R. Ge, **G. R. Arce**, G. Di Crescenzo, "Approximate Message Authentication Codes For N-ary Alphabets," accepted for publication in the *IEEE Trans. Signal Processing* Special issue on Secure Media II, 2005
9. G. Di Crescenzo, R. Ge, **G. R. Arce**, "Securing Reliable Server Pooling in MANET against Byzantine adversaries," submitted to IEEE Journal on Selected Areas in

Communications, 2005.

10. Y. Li and **G. R. Arce**, "Blind Weighted Myriad Equalization," to submitted to the *IEEE Transactions on Signal Processing*, 2005.
11. Y. Li, **G. R. Arce**, "Weighted Median Filters for Multichannel Signals," submitted to *IEEE Transactions on Signal Processing*, 2004.
12. Y. Li and **G. R. Arce**, "A Maximum Likelihood Approach To Least Absolute Deviation Regression," *EURASIP Journal on Applied Signal Processing*, 12, pp. 1762-1769, Sep. 2004
13. S. Hoyos, J. A. Garcia, and **G. R. Arce**, "Mixed-Signal Equalization Erchitectures for Printed Circuit Boards," *IEEE Transactions on Circuits and Systems I*: pp. 264-274, 51, 2, Feb. 2004.
14. S. Hoyos, B. M. Sadler, and **G. R. Arce**, "Mono-Bit Digital Receivers for Ultra-Wideband Communications," *to appear in the IEEE Transactions on Wireless Communications*, 2005.
15. S. Hoyos, Y. Li, J. Bacca, **G. R. Arce**, "Weighted Median Filters Admitting Complex-Valued Weights and Their Optimization," *IEEE Transactions on Signal Processing*, 52, 10, pp. 2776-2787, Oct. 2004
16. **G. R. Arce** and Y. Li, "Median Power and Median Correlation Theory," *IEEE Transactions on Signal Processing*, 50, 11, pp. 2768-2776, Nov. 2002
17. S. Hoyos, Y. Li, J. Bacca and **G. R. Arce**, "Complex Weighted Medians and their Optimization," submitted to *IEEE Transactions on Signal Processing*, 2002.
18. J. G. Gonzalez, E. A. Heredia, T. Rahman, K. E. Barner, and **G. R. Arce**. "Optimal Digital Filtering for Tremor Suppression," *IEEE Transactions on Systems, Man and Cybernetics*, 47, 5, pp. 664-673.
19. S. Kalluri and **G. R. Arce**, "Robust Frequency-Selective Filtering Using Weighted Myriad Filters Admitting Real-Valued Weights," *IEEE Transactions on Signal Processing*, 2001
20. **G. R. Arce** and R. Hasan, "Elimination of Interference Terms in the Wigner Ville Distribution Using Nonlinear Filtering," *IEEE Transactions on Signal Processing*, 2001.
21. F. Faheem, D. L. Lau, and **G. R. Arce**, "Green-Noise Cubes: Frequency Dependent Green-Noise Dither Arrays," to be submitted to the *Journal of the IS&T*.
22. A. M. Khan, D. L. Lau, and **G. R. Arce**, "Minimizing Moiré in Multi-Channel Green-Noise Masks," submitted to the *Journal of the Optical Society of America A*.
23. J. G. Gonzalez and **G. R. Arce**, "Zero-Order Statistics," submitted to the *IEEE Transactions on Signal Processing*.
24. L. Xie and **G. R. Arce**, "Approximate Image and Message Authentication Codes," submitted to the *IEEE Transactions on Image Processing*.
25. A. Flaig and **G. R. Arce**, "Near-Field Beamforming and High-Resolution Direction of

Arrival Estimation," submitted to the *IEEE Transactions on Signal Processing*.

26. **G. R. Arce** and Y. Li, "Median Power and Median Correlation Theory," to appear in the *IEEE Transactions on Signal Processing*, 2002.
27. C. Nino and **G. R. Arce**, "Data Embedding in Halftones Using Screen Codes," submitted to the *IEEE Transactions on Image Processing*.
28. A. Khan, D. Lau, and **G. R. Arce**, "Optimal Green Noise Halftone Masks Minimizing Moire Artifacts," submitted to the *IEEE Transactions on Image Processing*.
29. F. Faheem, D. Lau, and **G. R. Arce**, "Multilevel Halftoning Using Bilevel Quantizers," submitted to the *Journal of Electronic Imaging*.
30. K. M. Bloch and **G.R. Arce**, "Median Correlation for the Analysis of Gene Expression Data," *Signal Processing*, 83, pp. 811-823, Feb. 2003.
31. F. Faheem, D. L. Lau, and **G. R. Arce**, "Digital Multitoning Using Gray Level Separation," *Journal of Imaging Science and Technology*, 46, 5, pp. 385-397, Sept./Oct. 2002.
32. D. L. Lau, R. Ulichney, and **G. R. Arce**, "Blue and Green-Noise Halftoning Models," *IEEE Signal Processing Magazine*, 20, 4, pp. 28-28, July 2003.
33. L. Ma, **G. R. Arce**, and K. Barner, "An Improved Retransmission Algorithm for TCP" submitted to the *IEEE Signal Processing Letters*, 2002.
34. J. Paredes and **G. R. Arce**, "Optimization of Stack Filters Based on Mirrored Threshold Decomposition," *IEEE Transactions on Signal Processing*, 2002.
35. J. G. Gonzalez and **G. R. Arce**, "Statistically Efficient Filtering in Impulsive Environments," *Journal of Applied Signal Processing*, January, 2002.
36. M. Fisher, J. Paredes, and **G. R. Arce**, "Weighted Median Image Sharpeners for the World Wide Web," to appear in the *IEEE Transactions on Image Processing*, 2002.
37. D. Lau, A. Khan, and **G. R. Arce**, "Minimizing Stochastic Moire in FM Halftone by Means of Green-Noise-Masks," *Journal of the Optical Society of America A*, 19, 11, pp. 2203-2217, Nov. 2002.
38. J. L. Paredes, **G. R. Arce**, and L. Russo, "Multispectral Image Compression by Bijection Mappings onto Zero-Trees," *IEEE Transactions on Image Processing*, 11, 3, March 2002.
39. I. Shmulevich and **G. R. Arce**, "Spectral Design of Weighted Median Filters Admitting Negative Weight," *IEEE Signal Processing Letters*, 8, 12, Dec. 2001
40. L. Xie and **G. Arce**, "A Class of Authentication Digital Watermarks for Secure Multimedia Communication," *IEEE Transactions on Image Processing*, 10, 11, Nov. 2001.
41. S. Kalluri and **G. R. Arce**, "Robust Frequency-Selective Filtering Using Weighted Myriad Filters Admitting Real-Valued Weights," *IEEE Transactions on Signal Processing*, Aug. 2001.
42. I. Shmulevich, J. Paredes, and **G. R. Arce**, "Output Distributions of Stack Filters with Mirrored Threshold Decomposition," *IEEE Transactions on Signal Processing*, July, 2001
43. L. Xie and **G. R. Arce**, "Approximate Image Authentication Codes," *IEEE Transactions*

on *Multimedia*, 3, 2, June 2001.

44. J. G. Gonzalez and **G. R. Arce**, "Weighted Myriad Filters: A Powerful Framework for Efficient Filtering in Impulsive Environments," *IEEE Transactions on Signal Processing*, February 2001.
45. E. A. Heredia and **G. R. Arce**, "Shape Adaptive Networks Based on Combinations of Piecewise Polynomial Kernels," *IEEE Transaction on Signal Processing*, March 2000.
46. **G. R. Arce**, N. Grabowski, and N. C. Gallagher, "Weighted Median Filters with Sigma Delta Modulation Encoding," *IEEE Transactions on Signal Processing*, 48, 2, pp. 489 – 498, February 2000.
47. A. Flaig, K. Barner, and **G. R. Arce**, "Fuzzy Ranking: Theory and Applications," *Journal of Signal Processing*, 80, 6, pp. 1017 – 1036, 2000.
48. **G. R. Arce** and J. L. Paredes, "Recursive Weighted Median Filters Admitting Negative Weights and their Optimization," *IEEE Transactions on Signal Processing*, 48, 3, pp. 768 – 779, 2000.
49. D. L. Lau, **G. R. Arce**, and N. C. Gallagher, "Digital Color Halftoning with Generalized Error Diffusion and Multi-Channel Green-Noise Masks," *IEEE Transactions on Image Processing*, 9, 5, pp. 923 - 935, January 2000.
50. S. Kalluri and **G. R. Arce**, "Fast Algorithms for Weighted Myriad Computation by Fixed Point Search," *IEEE Transactions on Signal Processing*, 1, 48, pp. 159 – 171, January 2000.
51. J. L. Paredes and **G. R. Arce**, "Stack Smoothers, Stack Filters, and Mirrored Threshold Decomposition," *IEEE Transactions on Signal Processing*, 47, 11, pp. 2757 – 2767, Nov. 1999.
52. S. Kalluri and **G. R. Arce**, "A General Class of Nonlinear Normalized Adaptive Filtering Algorithms," *IEEE Transactions on Signal Processing*, 8, 47, August 1999.
53. D. L. Lau, **G. R. Arce**, and N. C. Gallagher, "Digital Halftoning by means of Green-Noise Masks," *Journal of the Optical Society of America A*, 16, 7, July 1999, pp. 1575-1586.
54. D. W. Griffith and **G. R. Arce**, "A Partially Decoupled RLS Algorithm for Volterra Filters," *IEEE Transactions on Signal Processing*, 47, 2, pp. 579-582, February 1999.
55. **G. R. Arce**, "A Generalized Weighted Median Filter Structure Admitting Negative Filter Weights," *IEEE Transactions on Signal Processing*, 46, 12, pp. 2849 – 2852, December 1998.
56. K. E. Barner, A. Flaig and **G. R. Arce**, "Fuzzy Time Rank Relations and Order Statistics," *IEEE Signal Processing Letters*, 5, 10, October 1998.
57. A. Flaig, **G. R. Arce**, and K. E. Barner. "Affine Order Statistic Filters: 'Medianization' of Linear FIR Filters," *IEEE Transactions on Signal Processing*, 46, 8, pp. 2101- 2112, August 1998.
58. D. L. Lau, **G. R. Arce**, and Neal C. Gallagher, "Green-Noise Digital Halftoning," *Proceedings of the IEEE*, 86, 12, pp. 2424-2444, December 1998.
59. X-G Xia, C. G. Boncelet and **G. R. Arce**, "Wavelet Transform based Watermark for Digital Images," *Optics Express* 3, 12, December 1998, pp. 477-523.
60. S. Kalluri and **G. R. Arce**, "Adaptive Weighted Myriad Filter Algorithms for Robust Signal Processing in α -stable Noise Environments," *IEEE Transactions on Signal*

Processing, 46, 2, pp. 322-334, February 1998.

61. D. W. Griffith and **G. R. Arce**, "Partially Decoupled Volterra Filters: Formulation and LMS Adaptation," *IEEE Transactions on Signal Processing*, 45, 6, pp. 1485-1494, June 1997.
62. K. E. Barner and **G. R. Arce**, "Coloring Schemes for the Design of Permutation Filters: A group theoretic method for filter class reduction," *IEEE Transactions on Circuits and Systems II: Analog and Digital Signal Processing*, July 1997.
63. E. A. Heredia and **G. R. Arce**, "Piecewise Linear System Modeling Based on a Continuous Threshold Decomposition," *IEEE Transactions on Signal Processing*, 44, 6, pp. 1440 – 1453, June 1996.
64. **G. R. Arce**, and M. Tian, "Order-Statistic Filter Banks," *IEEE Transactions on Image Processing*, 5, 6, pp. 827 – 837, June 1996.
65. J. Schwendowius and **G. R. Arce**, "Digital Video Format Conversion Algorithms," *IEEE Transactions on Circuits and Systems Video Technology*, 6, June 1996.
66. M. Mueller and **G. R. Arce**, "Truncation Artifacts in Tomographic Reconstruction from Projections," *Journal of Applied Optics*, 35, 20, p. 3902, July 1996.
67. **G. R. Arce**, T. A. Hall and K. E. Barner, "Permutation Weighted Order Statistic Filters," *IEEE Transactions on Image Processing*, 4, 8, pp. 1070 – 1083, August 1995.
68. Y.T. Kim, **G. R. Arce**, and N. Grabowski, "Inverse Halftoning using Binary Permutation Filters," *IEEE Transactions on Image Processing*, 4, 9, pp. 1296 – 1311, September 1995.
69. J. Gonzalez and **G. R. Arce**, "Multiple Access in Wireless Communications," *Col. Telecomm. Rev.*, Nov 1995.
70. K. E. Barner and **G. R. Arce**, "Permutation Filters: A New Nonlinear Filter Class Based on Set Permutations," *IEEE Transactions on Signal Processing*, April 1994.
71. Y.-T. Kim and **G. R. Arce**, "Permutation Filter Lattices: A General Order Statistic Filtering Framework," *IEEE Transactions on Signal Processing*, 42, 9, September 1994.
72. M. Mueller and **G. R. Arce**, "A Generalized Fan Beam Reconstruction Algorithm and its Applications," *Journal of the Optical Society of America A*, 11, 9, pp. 2410 – 2428, September 1994.
73. M. Mueller, **G. R. Arce**, and R. Blake, "Synthetic Scanner Reconstruction in Fan and Cone Beam Tomography," *Journal of Applied Optics*, 33, 35, pp. 8255 – 8269, Dec. 1994.
74. S. Chen and **G. R. Arce**, "Microstatistic LMS Filtering," *IEEE Transactions on Signal Processing*, 41, 3, pp. 1021 – 1034, March 1993.
75. **G. R. Arce**, "Microstatistics in Signal Decomposition and the Optimal Filtering Problem," *IEEE Transactions on Signal Processing*, 40, 11, pp. 2669 – 2682, November 1992.
76. K. E. Barner, **G. Arce**, and J. Lin, "Performance of Stack Filters and Vector Detection in Image Restoration," *Circuits, Systems, and Signal Processing*, 11, 1, January 1992.
77. R. Hardie and **G. R. Arce**, "Ranking in R_p and its use in Multivariate Image Estimation," *IEEE Transactions on Circuits and Systems, Video Technology*, 1, 2, pp. 197 – 209, June 1991.
78. **G. R. Arce**, "Motion Preserving Ranked Order based Filters for Image Sequence Processing," *IEEE Transactions on Acoustics, Speech, and Signal Processing*, SP39, 5, pp. 1146 – 1163, May 1991.
79. T. S. Rao, **G. R. Arce**, and J. Allebach, "Analysis of Ordered Dither for Arbitrary Sampling Lattices and Screen Periodicities," *IEEE Transactions on Acoustics, Speech, and*

Signal Processing, ASSP38, 11, pp. 1981 – 2000, November 1990.

80. **G. R. Arce** and R. Foster, "Detail Preserving Ranked Order Based Filters for Image Processing," *IEEE Transactions on Acoustics, Speech, and Signal Processing*, ASSP37, 1, pp. 83 – 98, January 1989.
81. **G. R. Arce** and S. Fontana, "The Midrange Estimator," *IEEE Transactions on Acoustics, Speech, and Signal Processing*, ASSP36, 6, pp. 920-922, June 1988.
82. **G. R. Arce** and N. C. Gallagher, "Stochastic Analysis of the Recursive Median Filter Process," *IEEE Transactions on Information Theory*, IT34, 4, pp. 669-679, July 1988.
83. T. Rao and **G. R. Arce**, "Halftone Patterns for Arbitrary Screen Periodicities," *Journal of The Optical Society of America A*, 5, September 1988.
84. M. McLoughlin and **G. R. Arce**, "Root Signal Analysis for the Recursive Separable Median Filter," *IEEE Transactions on Acoustics, Speech, and Signal Processing*, ASSP35, 1, January 1987.
85. **G. R. Arce** and M. McLoughlin, "Theoretical Analysis of the Max/Median Filter," *IEEE Transactions on Acoustics, Speech, and Signal Processing*, ASSP35, 1, pp. 60-69, January 1987.
86. **G. R. Arce** and R. L. Stevenson, "Synthesis of Median Filter Systems," *IEEE Transactions on Circuits and Systems*, CAS34, 4, pp. 420-429, April 1987.
87. R. L. Stevenson and **G. R. Arce**, "Morphological Filters: Statistics and Further Syntactical Properties," *IEEE Transactions on Circuits and Systems, Special Issue in Image Processing*, CAS34, 9, November 1987.
88. **G. R. Arce**, "Statistical Threshold Decomposition for Recursive and Non Recursive Median Filters," *IEEE Transactions on Information Theory*, IT 32, 2, pp. 243-253, March 1986.
89. R. L. Stevenson and **G. R. Arce**, "Binary Display of Hexagonally Sampled Continuous Tone Images," *Journal of The Optical Society of America A*, July 1985.
90. **G. R. Arce**, "Fibonacci and Related Sequences in Digital Filtering," *The Fibonacci Quarterly*, The, 22, August 1984.
91. **G. R. Arce** and N. C. Gallagher, "BTC Image Coding Using Median Filter Roots," *IEEE Transactions on Communications*, COM31, 6, pp. 784-793, June 1983.
92. **G. R. Arce** and N. C. Gallagher, "State Description of the Root Signal Set of Median Filters," *IEEE Transactions on Acoustics, Speech, and Signal Processing*, ASSP30, 6, pp. 894-902, December 1982.

REFERRED CONFERENCE PUBLICATIONS

1. I. D. Barrera, G. R. Arce, R. C. Nunez, S. Bohacek, "Diffusion Mechanisms for Congestion Making in Routers," submitted to SIGMMETRICS 2005.
2. G. R. Arce, R. C. Nunez, "Diffusion Marking Mechanisms for Active Queue Management," IEEE ICC 2005, Seoul, Korea, May 2005.
3. L. Ma, K. Barner, G. R. Arce, "Median RED for Congestion Control," in Proceedings of International Conference on Acoustics, Speech, and Signal Processing, Montreal, Canada, May, 2004.
4. L. Ma, K. Barner, G. R. Arce, "Statistical Analysis of TCP's Retransmission Timeout Algorithm," in Proceedings of the 38th Conference of Information Sciences and Systems, Princeton, NJ, March, 2003.

5. K. M. Bloch, **G. R. Arce**, "Time-Frequency Analysis of Protein Sequence Data," Proceedings of the 2001 IEEE-EURASIP Workshop on Nonlinear Signal and Image Processing, Baltimore, Maryland.
6. **G. R. Arce**, Z. Zhou and G. D. Crescendo, "Visual Cryptography Via Halftoning", proceedings of SPIE, 5293, pp. 393-404, Dec. 2003.
7. Z. Zhou, **G. R. Arce** and G. D. Crescendo, "Halftone Visual Cryptography", Proceedings of the 2003 International Conference on Image Processing (ICIP), Barcelona, Sep. 2003.
8. **G. R. Arce** and R. C. Nunez, "Diffusion Marking Mechanisms for Active Queue Management," Proceedings of the IEEE ICC 2005, Seoul, Korea, May 2005.
9. Z. Zhou, Yeong Taeg Kim and G. D. Crescendo, and **G. R. Arce**, "Frame Rate Conversion of Interlaced Video", Proceedings of 1st International Workshop on Video Processing and Quality Metrics for Consumer Electronics, Scottsdale, AZ, Jan. 2005
10. G. Di Crescenzo, **G. R. Arce** and R. Ge, "Threshold Cryptography in Mobile Ad Hoc Networks," Lecture Notes in Computer Science, 3352, pp.91-104, 2005, 4th International Conference, SCN 2004, Amalfi, Italy, Sep., 2004,
11. R. Ge, G.R. Arce, Di Crescenzo, "Approximate Message Authentication Codes For N-ary Alphabets," submitted to IEEE Transactions Signal Processing Supplement on Secure Media II.
12. G. Di Crescenzo, R. Ge, **G. R. Arce**, "Design and Analysis of DBMAC: An Error Localizing Message Authentication Code," in Proc. of Globecom 2004, Dallas, TX, Nov., 2004
13. G. Di Crescenzo, R. Ge and **G. R. Arce**, "Secure Service Provision for Reliable Server Pooling in MANET", in Proc. of 24th Army Science Conference 2004, Orlando, FL, Nov., 2004
14. S. Hoyos, J. Garcia, and **G. R. Arce**, "Mixed-Signal Equalization Architecture for Printed Circuit Board Channels, Proceedings of the 2002 International Conference on Acoustics, Speech, and Signal Processing, ICASSP '02, Orlando FL, May 13-17 2002.
15. Yinbo Li and **G. R. Arce**, "A Multichannel Weighted Median Filter for Complex Array Signal Processing," 2005 IEEE - EURASIP International Workshop on Nonlinear Signal and Image Processing (NSIP 2005), Sapporo, Japan, May 18-20, 2005
16. Y. Li, J. Bacca and **G. R. Arce**, "Weighted Median Filters for Multichannel Signals," 2005 IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP 2005), Philadelphia, PA USA, March 18-23, 2005
17. Y. Li, **G. R. Arce** and J. Bacca, "Generalized Vector Medians for Correlated Channels," 12th European Signal Processing Conference (EUSIPCO 2004), Vienna, Austria, September 6-10, 2004
18. Y. Li and **G. R. Arce**, "A Fast Maximum Likelihood Estimation Approach to LAD Regression," 2004 IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP 2004), Montreal, Canada, May 17-21, 2004

19. X. Wang, Y. Li, F. Kiamilev, J. Ekman, **G. R. Arce**, "Power Efficient Parallel Optical Communication Links," Optics in Computing 2003 (OC 2003), Washington DC, June 18-20, 2003
20. S. Hoyos, B. M. Sadler, and **G. R. Arce**, "High-Speed A/D Conversion for Ultra-Wideband Signals Based on Signal Projection over Basis Functions," *To appear in Proceedings of ICASSP 2004, International Conference on Acoustics, Speech and Signal Processing*, Montreal, Quebec, Canada, 2004.
21. J. Bacca, S. Hoyos, Y. Li, and **G. R. Arce**, "Weighted Median Based Filters for the Complex Domain," *To appear in Proceedings of ICASSP 2004, International Conference on Acoustics, Speech and Signal Processing*, Montreal, Quebec, Canada, 2004.
22. S. Hoyos, B. M. Sadler, and **G. R. Arce**, "Analog to Digital Conversion of Ultra-Wideband Signals in Orthogonal Spaces," *Proceedings of UWBST 2003, IEEE Conference on Ultra Wideband Systems and Technologies*, Reston, VA, 2003.
23. S. Hoyos, B. M. Sadler, and **G. R. Arce**, "Dithering and Sigma-Delta Modulation in Mono-bit Digital Receivers for Ultra-Wideband Communications," *Proceedings of UWBST 2003, IEEE Conference on Ultra Wideband Systems and Technologies*, Reston, VA, 2003.
24. S. Hoyos, Y. Li, J. Bacca, and **G. R. Arce**, "Weighted Median Filters Admitting Complex-valued Weights and their Optimization," *Proceedings of NSIP 2003, IEEE-EURASIP Workshop on Nonlinear Signal and Image Processing NSIP*, Grado-Trieste, Italy, 2003.
25. S. Hoyos, J. Bacca, and **G. R. Arce**, "Fast Spectral Design of Weighted Median Filters Admitting Complex Value Weights," *Proceedings of NSIP 2003, IEEE-EURASIP Workshop on Nonlinear Signal and Image Processing NSIP*, Grado-Trieste, Italy, 2003.
26. S. Hoyos, B. M. Sadler, and **G. R. Arce**, "On the Performance of Low Complexity Digital Receivers for Ultra-Wideband Communication Systems," *Proceedings of CTA 2003, Collaborative Technology Alliances Annual Symposium*, College Park, MD, 2003.
27. S. Hoyos, J. Garcia, and **G. R. Arce**, "Mixed-Signal Equalization Architectures for Printed Circuit Boards," *Proceedings of ICASSP 2002, International Conference on Acoustics, Speech and Signal Processing*, Orlando, FL, 2002.
28. C. Nino, D. Lau, and **G. R. Arce**, "Green Noise Digital Halftoning for High-Resolution Printers (*Invited Paper*), Proceedings of the Electronic Imaging Conference, Photonics West, San Jose, CA, Jan. 2002.
29. Bloch, K.M. and **G. R. Arce**, "Time-Frequency Analysis of Protein Sequence Data." 2001 IEEE-EURASIP Workshop on Nonlinear Signal and Image Processing. Baltimore, Maryland. June 2001.
30. Bloch, K.M. and **G. R. Arce**, "Nonlinear Correlation Measures for Gene Expression Data" submitted to ISBM02 (Intelligent Systems for Molecular Biology), Edmondton, Aug. 2002.
31. L. Xie, M. Wilson, R. Graveman, **G. R. Arce**, "Fast Image Search with Approximate Image Authentication Codes, ITCOM Conference, Aug. 2002.
32. Karen M. Bloch and **Gonzalo R. Arce**, "Nonlinear Correlation for the Analysis of Gene Expression Data", *Proceedings of the 2002 Workshop on Genomic Signal Processing and Statistics*, Raleigh, North Carolina, October 11-13, 2002.

33. Y. Li and **G. R. Arce**, "Median Correlation Theory," 2001 IEEE - EURASIP International Workshop on Nonlinear Signal and Image Processing (NSIP 2001), Baltimore, MD USA, June 3-6, 2001
34. Y. Li and **G. R. Arce**, "Robust and Tunable Correlation Estimates Using Weighted Myriads," 2001 IEEE - EURASIP International Workshop on Nonlinear Signal and Image Processing (NSIP 2001), Baltimore, MD USA, June 3-6, 2001
35. C. Nino and **G. R. Arce**, "Watermarking of Digital Halftones with Screen Codes," Proceedings of the 2001 IEEE-EURASIP Workshop on Nonlinear Signal and Image Processing, (Baltimore, MD), June 2001.
36. I. Shmulevich and **G. R. Arce**, "Generalized Mallows' Optimization for Weighted Median Filters Admitting Negative Weights", Proceedings of the 2001 IEEE-EURASIP Workshop on Nonlinear Signal and Image Processing, (Baltimore, MD), June 2001.
37. F. Faheem, D. Lau, and **G. R. Arce**, "Reducing Texture in Multitones Using Gray Level Separation," Proceedings of the 2001 IEEE-EURASIP Workshop on Nonlinear Signal and Image Processing, (Baltimore, MD), June 2001.
38. J. Paredes and **G. R. Arce**, "Stack Filters Based on Mirrored Threshold Decomposition," "Proceedings of the 2001 IEEE-EURASIP Workshop on Nonlinear Signal and Image Processing, (Baltimore, MD), June 2001.
39. J. Paredes and **G. R. Arce**, "Optimization of Stack Filters Based on Mirrored Threshold Decomposition," Proceedings of the 2001 IEEE-EURASIP Workshop on Nonlinear Signal and Image Processing, (Baltimore, MD), June 2001.
40. L. Russo, J. Paredes, and **G. R. Arce**, "Polarimetric SAR Denoising Using Bijection Mappings," Proceedings of the 2001 IEEE-EURASIP Workshop on Nonlinear Signal and Image Processing, (Baltimore, MD), June 2001.
41. D. Lau, A. Khan, **G. R. Arce**, "Stochastic Moire," 2001 *Image Processing, Image Quality, Image Capture Systems Conference*, Montreal, Canada, April 22-25, 2001.
42. F. Faheem, D. Lau, **G. R. Arce**, "Multilevel Halftoning Using Binary Quantization," 2001 *Image Processing, Image Quality, Image Capture Systems Conference*, Montreal, Canada, April 22-25, 2001.
43. H. Tayong, A. Beasley, A. Cole-Rhodes, A. B. Cooper, and **G. R. Arce**, "Parametric Diversity Combining in Fast Frequency Hoping." ARL Federated Laboratory Capstone Symposium, College Park, MD, 2001.
44. **G. R. Arce**, F. Ahnert, and R. Graveman, "Image Retrieval and Multi-Dimensional Searching" ARL Federated Laboratory Capstone Symposium, College Park, MD, 2001.
45. L. Xie, **G. R. Arce**, and R. Graveman, "Image Retrieval Using Color AMAC Signatures," ARL Federated Laboratory Capstone Symposium, College Park, MD, 2001.
46. L. Russo, J. Paredes, **G.R. Arce**, "Polarimetric SAR Denoising Using Bijection Mapping," *NSIP*, Baltimore, MD, June 2001.
47. J. Paredes, **G.R. Arce**, "Optimization of Stack Filters Based on Mirrored Threshold Decomposition," *NSIP*, Baltimore, MD, June 2001
48. J. Paredes, **G.R. Arce**, "Stack Filters Based on Mirrored Threshold Decomposition," *NSIP* Baltimore, MD, June 2001.
49. F. Faraz, D. Lau, **G.R. Arce**, "Reducing Texture in Multitones Using Gray Level Separation," *NSIP*, Baltimore, MD, June 2001.
50. Y. Li, **G.R. Arce**, "Robust and Tunable Correlation Estimates Using Weighted Myriads,"

NSIP, Baltimore, MD, June 2001.

51. Y. Li, **G.R. Arce**, "Median Correlation Theory," *NSIP*, Baltimore, MD, June 2001.
52. I. Shmulevich, **G.R. Arce**, "Generalized Mallows' Optimization for Weighted Median Filters Admitting Negative Weights," *NSIP*, Baltimore, MD, June 2001.
53. K. Bloch, **G.R. Arce**, "Time-Frequency Analysis of Protein Sequence Data," *NSIP*, Baltimore, MD, June 2001.
54. C. Nino, **G.R. Arce**, "Watermarking of Digital Halftones with Screen Codes," *NSIP*, Baltimore, MD, June 2001.
55. L. Xie, **G.R. Arce**, R. Graveman, "Fast Image Querying Using Color Similarity Signatures," Proc. *U.S. Army ATIRP Ann. Telecomm. Conf.*, College Park, MD, February 2001.
56. L.E. Russo, J. Paredes, **G.R. Arce**, "Polymetric SAR Denoising Using Bijection Mapping," Proc. *U.S. Army ATIRP Ann. Telecomm. Conf.*, College Park, MD, February 2001.
57. **G.R. Arce**, F. Ahnert, R.F. Graveman, "Image Retrieval and Multi-Dimensional Searching," Proc. *U.S. Army ATIRP Ann. Telecomm. Conf.*, College Park, MD, February 2001.
58. **G. R. Arce** and R. Hasan, "Elimination of Interference Terms in the Wigner Ville Distribution Using Nonlinear filtering." Proceedings of the *2000 European Signal Processing Conference (EUSIPCO'2000)*, Tampere, Finland. To appear.
59. J. Paredes, **G. R. Arce**, and L. Russo, "Multispectral Image Compression by Bijection Mappings onto Zero-Trees," *IEEE International Conference on Image Processing (ICIP'2000)*, Vancouver, CA, September 2000. Submitted.
60. M. Fisher, J. Paredes, and **G. R. Arce**, "Stack Filters and Mirrored Threshold Decomposition," *IEEE International Conference on Image Processing (ICIP'2000)*, Vancouver, CA, September 2000. Submitted.
61. J. Paredes, and **G. R. Arce**, "Recursive WM Filters for Image Denoising," *IEEE International Conference on Image Processing (ICIP'2000)*, Vancouver, CA, September 2000. Submitted.
62. J. Paredes, M. Fisher, and **G. R. Arce**, "Weighted Median Image Sharpeners for the World Wide Web," *IEEE International Conference on Image Processing (ICIP'2000)*, Vancouver, CA, September 2000. Submitted.
63. A. Flaig and **G. R. Arce**, "Near-Field Spot Beamforming with Distributed Antennas." Submitted to the *4th Annual Symposium on Advanced Telecommunications/Information Distribution Research Program (ATIRP)*, College Park, MD, March 2000.
64. H. Tayong, A. Cole-Rhodes, A. B. Cooper, A. Flaig and **G. R. Arce**, "A Reduced Complexity Detector for Fast Frequency Hopping." Submitted to the *4th Annual Symposium on Advanced Telecommunications/Information Distribution Research Program (ATIRP)*, College Park, MD, March 2000.
65. L. Xie, **G. R. Arce**, A. Lewis, and E. B. Basch "Image Authentication Watermarking," submitted to the *4th Annual Symposium on Advanced Telecommunications/Information Distribution Research Program (ATIRP)*, College Park, MD, March 2000.
66. I. Shmulevich, J. Paredes, and **G. R. Arce**, "Output Distributions of Stack Filters Based on Mirrored Threshold Decomposition," *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP'2000)*, Istanbul, Turkey, September 2000. Submitted.

67. J. Paredes, **G. R. Arce**, and L. Russo, "Multispectral Image Compression by Bijection Mappings onto Zero-Trees," submitted to the *4th Annual Symposium on Advanced Telecommunications/Information Distribution Research Program (ATIRP)*, College Park, MD, March 2000.
68. R. Graveman, L. Xie, and **G. R. Arce**, "Approximate image authentication codes," submitted to the *4th Annual Symposium on Advanced Telecommunications/Information Distribution Research Program (ATIRP)*, College Park, MD, March 2000.
69. J. Paredes, M. Fisher, and **G. R. Arce**, "Image Sharpening Using Permutation Weighted Median Filters," *Proceedings of the 2000 European Signal Processing Conference (EUSIPCO'2000)*, Tampere, Finland. To appear.
70. **G. R. A. Flaig** and **G. R. Arce**, "Near-field Spot-Beamforming with Distributed Antennas," *First IEEE Sensor Array and Multichannel (SAM) Signal Processing Workshop*, Cambridge, MA, March 2000. Submitted.
71. D. L. Lau, **G. R. Arce**, and N. C. Gallagher, "Robust Halftoning with Green-Noise," *IS&T's Image Processing Image Quality Image Capture Systems Conference (PICS'99)*, Savannah, GA USA, April 26-28, 1999.
72. J. L. Paredes, **G. R. Arce**, and X. Xia, "Multicomponent Image Compression using Vector Wavelets," *Proceedings of the U. S. Army ATIRP Ann. Telecomm. Conf.*, College Park, MD, Feb. 1999.
73. **G. R. Arce**, C. Boncelet, and R. Graveman, "Applications of Information Hiding," *Proceedings of the U. S. Army ATIRP Federated Laboratory Ann. Telecomm. Conf.*, College Park, MD, Feb. 1999.
74. A. Flaig, A. B. Cooper, **G. R. Arce**, H. Tayong, and A. Cole-Rhodes, "Fuzzy Rank-Order Detectors for Frequency Hopping Networks." *Proceedings of the 3rd Annual Symposium on Advanced Telecommunications/Information Distribution Research Program (ATIRP)*, College Park, MD, Feb. 1999.
75. L. Xie and **G. R. Arce**, "Capacity Issues in Watermarking," *Proceedings of the U. S. Army ATIRP Federated Laboratory Ann. Telecomm. Conf.*, College Park, MD, Feb. 1999.
76. A. Flaig, A. B. Cooper, and **G. R. Arce**, "Rank-Order Diversity Detectors for Wireless Communications in Hostile Environments." *Proceedings of the 3rd Annual Symposium on Advanced Telecommunications/Information Distribution Research Program (ATIRP)*, College Park, MD, Feb. 1999.
77. J. L. Paredes and **G. R. Arce**, and L. Russo, "A Novel Method for Hyperspectral Multispectral Image Compression." *Proceedings of the Workshop on Hyperspectral Multispectral Sensor Measurements Modeling and Simulations*. Huntsville, Alabama, Sept. 99.
78. Liehua Xie, **G. R. Arce**, A. Lewis, E. Bert Basch, "Secure MPEG2 Video Communication by Watermarking" *Proceedings of the 3rd annual Conference of the ATIRP Federated Laboratory Ann. Telecomm. Conf.*, College Park, MD, Feb. 1999.
79. S. Kalluri, **G. R. Arce** and A. B. Cooper III, "Optimum Sequence Estimation for Non-Gaussian Channels with Intersymbol Interference," *Proceedings of the 1999 Conference on Information Sciences and Systems*, Baltimore, MD, U.S.A., March 1999.
80. **G. R. Arce**, S. Kalluri and A. B. Cooper III, "Maximum Likelihood Decoding of Convolutional Codes for Non-Gaussian Channels," *Workshop on Applications of Heavy-Tailed Distributions in Economics, Engineering and Statistics*, American University, Washington, D.C.,

June 1999.

81. A. Flaig and **G. R. Arce**, "Rank-Order Diversity Detectors for Wireless Communications," Proceedings of the *IEEE International Conference on Acoustics, Speech, and Signal Processing (ICASSP'99)*, Phoenix, AZ, USA, March 1999.
82. J. L. Paredes and **G. R. Arce**, "A General Recursive Weighted Median Filter Structure Admitting Real-Values Weights and their Optimization". Proceedings of the *1999 IEEE-EURASIP Workshop on Nonlinear Signal and Image Processing*. Antalya Turkey, Jun. 1999.
83. D. L. Lau and **G. R. Arce**, "Digital Halftoning with Green-Noise Masks," *IS&T's International Conference on Digital Printing Technologies (NIP 15)*, Orlando, FL. USA, October 17 22, 1999.
84. X. Xie and **G. R. Arce**, "Watermarking a Blind Authentication Digital Image Signature," Proc. *U. S. Army ATIRP Ann. Telecomm. Conf.*, College Park, MD, January 1998.
85. **G.R. Arce**, C.G. Boncelet, X. Xia, "A Wavelet Watermark for Digital Images," Proc. *U.S. Army ATIRP Ann. Telecomm. Conf.*, College Park, MD, January 1998
86. J. L. Paredes and **G. R. Arce**, "Denoising of Polarimetric SAR Images for Compression," Proc. *U. S. Army ATIRP Ann. Telecomm. Conf.*, College Park, MD, January 1998.
87. **G. R. Arce**, "A Generalized Weighted Median Filter Admitting Real-Valued Filter Weights," Proceedings of the *1998 IEEE International Conference on Acoustics, Speech, and Signal Processing*, Seattle, WA, May 1998.
88. X. Xie and **G. R. Arce**, "A Wavelet Based Watermarking for Image Authentication," *1998 European Signal and Image Processing Conference (EUSIPCO'98)*, Rhodes, Greece, August 1998.
89. D. L. Lau, **G. R. Arce**, and N. C. Gallagher, "Green-Noise Digital Halftoning," *IEEE International Conference on Image Processing (ICIP'98)*, Chicago, IL. USA, October 4-7, 1998.
90. X. Xie and **G. R. Arce**, "Watermarking a Blind Authentication Digital Signature on Compressed Images," Proceedings of the *IEEE International Conference on Image Processing (ICIP'98)*, Chicago, IL. USA, October 4-7, 1998.
91. J. L. Paredes, **G. R. Arce** and X. Xia, "Multicomponent (Vector) Image Compression Using Vector Wavelets". Proceedings of the *1998 Workshop on Data Compression Processing Techniques for Missile Guidance Data Links*. University of Alabama, Volume 1. Dec. 1998.
92. S. Kalluri and **G. R. Arce**, "A General Class of Nonlinear Normalized LMS Type Adaptive Filtering Algorithms," Proceedings of the *1998 Conference on Information Sciences*, Princeton NJ, 1998.
93. X-G Xia, C. G. Boncelet, and **G. R. Arce**, "A Multiresolution Watermark for Digital Images," Proceedings of the *1997 IEEE International Conference in Image Processing*, Santa Barbara, CA, 1997.
94. J. G. Gonzalez, D. W. Griffith, A. B. Cooper, and **G. R. Arce**, "Robust Adaptive Receivers for Channels with Uncertain Impulsiveness," Proc. *U. S. Army ATIRP Ann. Telecomm. Conf.*, College Park, MD, January 1997.
95. J. L. Paredes, **G. R. Arce**, and N. C. Gallagher, "Nonlinear Signal Decompositions for Zero-Tree Image Coding," Proc. *U. S. Army ATIRP Ann. Telecomm. Conf.*, College Park, MD, January 1997.
96. J. G. Gonzalez, D. L. Lau and **G. R. Arce**, "Towards a General Theory in Non-Linear Filtering: Selection Filters," *IEEE International Conference on Acoustics, Speech, and Signal*

Processing (ICASSP97), Munich, Germany, March 1997.

97. S. Kalluri and **G. R. Arce**, "Adaptive Algorithms for Weighted Myriad Filter Optimization," Proc. *IEEE Int. Conf. on Acoustics, Speech and Signal Processing (ICASSP97)*, Munich, Germany April 1997.
98. A. Flaig, **G. R. Arce**, and A. Flaig, "Affine Order Statistic Filters," Proc. *IEEE Int. Conf. on Acoustics, Speech and Signal Processing*, Munich, Germany, April 1997.
99. D. W. Griffith, J. G. Gonzalez, and **G. R. Arce**, "Robust Time Frequency Representations for Signals in Alpha Stable Noise," (invited paper) Proc. *1997 Conf. on Information Sciences and Systems*, Baltimore, MD, March 1997.
100. J. G. Gonzalez, D. W. Griffith, A. B. Cooper, and **G. R. Arce**. "Adaptive Reception in Impulsive Noise." Proceedings of *the IEEE Int. Symposium on Information Theory*, Ulm, Germany, June 1997.
101. J. G. Gonzalez, D. W. Griffith, and **G. R. Arce**, "Zero Order Statistics: A Signal Processing Framework for Very Impulsive Environments." Proceedings of the *IEEE Signal Processing Workshop on Higher Order Statistics*, Banff Alberta, Canada, July 1997.
102. D. W. Griffith, J. G. Gonzalez, and **G. R. Arce**. "Robust Time Frequency Representations for Signals in Alpha Stable Noise Using Fractional Lower Order Statistics," Proceedings of the *IEEE Signal Processing Workshop on Higher Order Statistics*, Banff Alberta, Canada, July 1997.
103. J. Paredes, D. Lau, **G. R. Arce**, and N. C. Gallagher, "Zero-Tree Like Codec with Nonlinear Signal Decompositions," Proceedings of *the 1997 IEEE/EURASIP Workshop on Nonlinear Signal and Image Processing*, Mackinaw Island, MI, September 1997.
104. X. Xia, C. G. Boncelet Jr, and **G. R. Arce**, "A Multiresolution Watermark for Digital Images," Proceedings of the *1997 IEEE International Conference on Image Processing*, Santa Barbara CA, 1997.
105. J. Gonzalez, D. Griffith, and **G. Arce**, "Matched Myriad Filtering for Robust Communications," Proceedings of *the 1996 Conference on Information Sciences and Systems CISS'96*, Princeton NJ, April 1996.
106. H. Cui, **G. Arce**, and N. Gallagher, "Rank Entropy of Median Filters," Proceedings of *the 1996 Conference on Information Sciences and Systems CISS'96*, Princeton NJ, April 1996.
107. D. L. Lau and **G. R. Arce**, "Order Statistic Wavelet Shrinkage: Denoising in Non-Gaussian Environments," *Conference on Image Sciences and Systems (CISS'96)*, Princeton, NJ. USA, March 1996.
108. D. L. Lau, **G. R. Arce**, and N. C. Gallagher, "Robust Image Wavelet Shrinkage for Denoising," *IEEE International Conference on Image Processing (ICIP'96)*, Lusanne, Switzerland, August 1996.
109. S. Kalluri and **G. R. Arce**, "Adaptive Algorithms for Weighted Myriad Filter Optimization," Proceedings of the *1996 Conference on Information Sciences and Systems CISS'96*, Princeton NJ, April 1996.
110. E. Heredia and **G. R. Arce**, "On Channel Equalization Using Piecewise Polynomial Kernels," Proceedings of the *1996 Conference on Information Sciences and Systems (CISS'96)*, Princeton NJ, April 1996.
111. E. Heredia and **G. R. Arce**, "Piecewise Polynomial Kernel Networks," Proceedings of the *1996 IEEE International Conference on Neural Networks*, Washington, DC, May 1996.
112. J. Gonzalez and **G. R. Arce**, "Weighted Myriad filters: A Robust Filtering Framework

- Derived from Alpha Stable Distributions," Proceedings of the *1996 International Conference on Acoustics, Speech, and Signal Processing*, Atlanta GA, May 1996.
113. E. Heredia and **G. R. Arce**, "Piecewise Volterra Filters Based on the Threshold Decomposition Operator," Proceedings of the *1996 International Conference on Acoustics, Speech, and Signal Processing (ICASSP'96)*, Atlanta GA, May 1996.
 114. P. Zurbach, J. Gonzalez, and **G. R. Arce**, "Weighted Myriad Filters for Image Processing," Proceedings of the *1996 IEEE International Symposium on Circuits and Systems*, Atlanta GA, May 1996.
 115. J. Gonzalez, E. Heredia, K. Barner, and **G. R. Arce**, "A Customized Optimal Filter for Eliminating Operator's Tremor," *SPIE Photonics East*, Philadelphia PA, October 1995.
 116. **G. R. Arce**, J. Gonzalez, and P. Zurbach, "Weighted Myriad Filters in Imaging," Proc. *Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove CA, November 1996.
 117. D. Griffith and **G. R. Arce**, "Order Statistic QMF Filter Banks," Proceedings of the *1995 Conference on Information Sciences*, Baltimore, MD, March 1995.
 118. E. Heredia and **G. R. Arce**, "Approximation Networks Based on Shape Adaptive Kernels Using Localized Threshold Decomposition," Proceedings of the *1995 Conference on Information Sciences*, Baltimore, MD, March 1995.
 119. **G. R. Arce** and S. Basu, "Nonlinear Signal and Image Processing Using Order Statistics," Proceedings of the *IS&T's 48th Annual Conference*, Washington D.C., November 1995.
 120. J. G. Gonzalez, E. A. Heredia, T. Rahman, K. E. Barner, S. K. Basu, and **G. R. Arce**, "A New Approach to Suppressing Abnormal Tremor Through Signal Equalization," Proceedings of the *18th RESNA International Conference*, Vancouver, BC, Canada, June 1995.
 121. **G. R. Arce**, N. Grabowski, and N. C. Gallagher, "Weighted Median Filters with Sigma Delta Modulation Encoding," (invited paper) Proceedings of the *1995 IEEE Workshop on Nonlinear Digital Signal Processing*, Halkidiki, Greece, June 1995.
 122. S. Basu and **G. R. Arce**, "Multichannel Permutation Filters," (invited paper). Proceedings of the *1995 IEEE Workshop on Nonlinear Digital Signal Processing*, Halkidiki, Greece, June 1995.
 123. J. G. Gonzalez, E. A. Heredia, T. Rahman, K. E. Barner, and **G. R. Arce**, "Filtering Involuntary Motion of People with Tremor Disability Using Optimal Equalization (invited paper), Proceedings of the *1995 IEEE International Conference on Systems, Man and Cybernetics*. Vancouver, BC, Canada, October 1995.
 124. J. G. Gonzalez, E. A. Heredia, T. Rahman, K. Barner, and **G. R. Arce**, "A Customized Optimal Filter for Eliminating Operator's Tremor," Proceedings of *Telemanipulator and Telepresence Technologies SPIE's Int. Symp. Intel. Sys. and Adv. Manuf.*, Philadelphia PA, October 1995.
 125. S. Basu and **G. R. Arce**, "Multichannel Permutation Order Statistic Filters," Proceedings of the *1995 IEEE International Conference on Image Processing*, Washington D.C., May 1995.
 126. M. Mueller and **G. R. Arce**, "A Universal Fan Beam Reconstruction Algorithm," Proceeding of the *1994 ECAPT Conference*, Oporto, Portugal, March 1994.
 127. E. Heredia and **G. R. Arce**, "Nonlinear Modeling Using Threshold Decomposition Filters," Proceedings of the *1994 Conference on Information Sciences and Systems*, Princeton NJ, March 1994.
 128. E. Heredia and **G. R. Arce**, "Piecewise Linear Autoregression Through Threshold Decomposition," Proceedings of the *1993 International Conference on Acoustics, Speech, and Signal Processing (ICASSP'93)*, Minneapolis MN, May 1993.

129. Y.T. Kim and **G. R. Arce**, "Permutation Filter Lattices: A General Order Statistic Filtering Framework," Proceedings of the 1993 *International Conference on Acoustics, Speech, and Signal Processing Minneapolis MN*, May 1993.
130. T. Hall, **G. R. Arce**, and K. E. Barner, "Permutation Weighted Order-Statistic Filters," Proceeding of the *1993 Conference on Information Sciences and Systems*, Baltimore MD, March 1993.
131. M. Mueller and **G. R. Arce**, "Three Dimensional Synthetic Tomographic Arrays," Proceeding of the *1993 ECAPT Conference*, Karlsruhe, Germany, March 1993.
132. S. Chen and **G. R. Arce**, "Micro Statistic LMS Filtering," (invited paper), Proceedings of the *1992 IEEE International Symposium on Circuits and Systems*, San Diego CA, May 1992.
133. K. E. Barner and **G. R. Arce**, "Permutation Filters: A Group Theoretic Class of Filters," Proceedings of the *1992 Information Conference on Information Sciences and Systems*, Princeton NJ, March 1992.
134. **G. R. Arce** and M. Tian, "Q L Coordinate Transformations for Order Statistic Filtering (invited paper), Proceedings of the *1992 IEEE International Conference on Systems Engineering* Kobe, Japan, September 1992.
135. R. Hardie, C. Boncelet, and **G. R. Arce**, "LUM Filters for Smoothing and Sharpening," Proceedings of the *SPIE Conference on Non Linear Image Processing*, San Jose CA March 1991.
136. R. Hardie and **G. R. Arce**, "Ranking in R_p and its Use in Multivariate Image Estimation," Proceedings of the *SPIE/SPSE Symposium on Electronic Imaging*, Santa Clara CA, February 1990.
137. K. E. Barner, **G. R. Arce**, and J. Lin, "On the Performance of Stack Filters and Vector Detection in Image Restoration," Proceedings of the *SPIE/SPSE Symposium on Electronic Imaging*, Santa Clara CA, February 1990.
138. R. Feehs and **G. R. Arce**, "Optimal Detection Approaches to Image Restoration," Proceedings of the *1989 Conference on Information Sciences and Systems*, Baltimore MD, March 1989.
139. T. Rao, **G. R. Arce**, and J. P. Allebach, "Ordered Dithering with Arbitrary Sampling Lattices and Screen Periodicities," (invited paper) Proceedings of the *42nd Annual SPSE Conference*, Boston MA, May 1989.
140. K. E. Barner and **G. R. Arce**, "Distributed Detection Algorithms for Image Restoration in Signal Dependent Noise," *1989 SPIE Conference on Visual Communications and Image Processing*, Philadelphia PA, Nov. 1989.
141. D. Brown, **G. R. Arce**, and C. Ih, " Autonomous Robotic Navigation Using Holographic Laser Projected Light," Proceedings of the *SPIE Conference on Intelligent Robots and Computer Vision*, Philadelphia PA, Nov. 1989.
142. K. E. Barner and **G. R. Arce**, "Detection Approaches to the Restoration of Images in Signal Dependent Noise (Invited paper)," Proceedings of the *32nd Midwest Symposium on Circuits and Systems*, Urbana IL, August 1989.
143. **G. R. Arce**, "Motion Preserving Ranked Order Filters for Image Sequence Processing," (invited paper), Proceedings of the *1989 International Symposium on Circuits and Systems*, Portland OR, June 1989.
144. **G. R. Arce** and R. Foster, "Multilevel Median Filters: Properties and Efficacy," Proceeding of the *1988 International Conference on Acoustics, Speech, and Signal Processing*, New York, NY,

March 1988.

145. T. S. Rao, **G. R. Arce**, "Halftone Patterns for Arbitrary Screen Periodicities," Proceedings of the *1988 International Conference on Acoustics, Speech, and Signal Processing (ICASSP88)*, New York, NY, March 1988.
146. **G. R. Arce**, R. Foster, and P. Warter, "Recursive Multistage Median Filters," Proceedings of the *1988 Conference on Information Sciences and Systems*, Princeton NJ, March 1988.
147. **G. R. Arce**, R. Foster, and P. Warter, "Multistage Median Filters and their VLSI Implementation," (invited paper) Proceedings of the *1988 International Symposium on Circuits and Systems*, Espoo, Finland, June 1988.
148. D. Brown, **G. R. Arce**, and C. Ih, "Morphological 3Dimensional Scene Segmentation Using Laser Scanned Structured Light," Proceedings of the *1988 International Symposium on Circuits and Systems*, Espoo, Finland, June 1988.
149. D. Brown, **G. R. Arce**, and C. Ih, "Scanned Structured Light Processing for Autonomous Robotic Navigation," *Technical Digest of the Optical Society of America*, October 1988.
150. T. Rao and **G. R. Arce**, "Bivariate Distributions of Recursively Median Filtered Signals," Proceedings of the *1987 Conference on Information Sciences and Systems*, Baltimore MD March 1987.
151. R. Feehs and **G. R. Arce**, "Multidimensional Morphological Edge Detection," Proceedings of the *SPIE Conference on Visual Communications and Image Processing*, Cambridge, MA, Oct. 1987.
152. W. Wonchoba and **G. R. Arce**, "Estimating the 3Dimensional Motion of a Rigid Plane in the Hough Parameter Space," Proceedings of the *SPIE Conference on Intelligent Robots and Computer Vision*, Cambridge MA, Oct. 1987.
153. D. Brown, **G. R. Arce**, and C. Ih, "Scene Segmentation for Autonomous Robotic Navigation Using Sequential Laser Projected Light," Proceedings of the *SPIE Conference on Intelligent Robots and Computer Vision*, Cambridge, MA, Oct. 1987.
154. **G. R. Arce**, "Multilevel Median Filters," Proceedings of the *1987 Annual Allerton Conference on Communications, Control, and Computing*, Urbana IL, October 1987.
155. T. Rao and **G. R. Arce**, "Vector Dithering with Unconventional Plane Tessellations", Proceedings of the *1987 Annual Allerton Conference on Communications, Control, and Computing*, Urbana IL, October 1987.
156. **G. R. Arce** and R. L. Stevenson, "Synthesis of Median Filter Systems," Proceedings of the *18th Annual Conference on Information Sciences and Systems*, Princeton NJ, March 1986.
157. T. Gardos, **G. R. Arce**, and J. Allebach, "Optimal Image Binarization in Hexagonal Lattices," Proceedings of the *18th Annual Conference on Information Sciences and Systems*, Princeton NJ, March 1986.
158. R. L. Stevenson and **G. R. Arce**, "Morphological Filters," (Invited Paper) Proceedings of the *1986 Annual Allerton Conference on Communications, Control, and Computing*, Urbana IL, October 1986.
159. **G. R. Arce** and S. Fontana, "The Midrange Estimator," *Technical Digest of the 1985 Annual Meeting of the Optical Society of America*, Washington D.C., Oct. 1985.
160. **G. R. Arce**, "Statistical Threshold Decomposition for Median Filters," Abstracts of the *1986 International Symposium on Information Theory*, Ann Arbor, Michigan, Oct. 1985.
161. M. Mc Loughlin and **G. R. Arce**, "Theoretical Analysis of the Max/Median Filter," Proceedings of the *1985 Annual Allerton Conference on Communications, Control, and*

Computing, Urbana IL, October 1985.

162. P. J. Warter and **G. R. Arce**, "A Median Filter Architecture Suitable for VLSI Implementation," Proceedings of the *1985 Annual Allerton Conference on Communications, Control, and Computing*, Urbana IL, October 1985.
163. **G. R. Arce**, "Multidimensional Ranked Filtering," (invited paper) Proceedings of the *4th ASSP Workshop in Multidimensional Signal Processing*, Leesburg VA, Aug. 1985.
164. M. McLoughlin and **G. R. Arce**, "Root Properties and Convergence for Recursive Separable Median Filters," Proceedings of the *1985 Conference on Information Sciences and Systems*, Baltimore MD, March 1985.
165. R. Crinon and **G. R. Arce**, "Median Filters: Analysis for Signals with Additive Impulsive Noise" Proceedings of the *1984 Annual Allerton Conference on Communications, Control, and Computing*, Urbana IL, October 1984.
166. R. Pearson and **G. R. Arce**, "Median Filters as Spectral Windows", Proceedings of the *7th Annual IEEE Micro Delcon Conference*, Newark DE, March 1984.
167. R. Crinon and **G. R. Arce**, "Median Filters: Analysis for 2Dimensional Recursively Filtered Signals," Proceedings of the *1984 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP'84)*, San Diego CA, March 1984.
168. **G. R. Arce**, E. Malaret, and D. Landgrebe, "Multispectral Classification Using Median Filters," Proceedings of the *6th Annual IEEE Micro Delcon Conference*, Newark DE, March 1983.
169. **G. R. Arce**, B. Hoerl, and J. P. Allebach, "Spectral Range Estimation Using Jittered Sampling," Proceedings of the *1983 Conference on Information Science and Systems*, Baltimore MD, March 1983.
170. B. Hoerl and J. P. Allebach, and **G. R. Arce**, "Aliasing Reduction on Nonlinear Systems Response Using Jittered Sampling," Proceedings of the *1983 Conference on Information Science and Systems*, Baltimore MD, March 1983.
171. J. Dalton, **G. R. Arce**, and J. P. Allebach, "Error Diffusion Using Random Field Models," Proceedings of the *SPIE's 27th Annual International Symposium*, San Diego, Aug. 1983.
172. **G. R. Arce** and N. C. Gallagher, "Root Signal Analysis for Median Filters," Proceedings of the *1980 Annual Allerton Conference on Communications, Control, and Computing*, Urbana IL, October 1980.
173. **G. R. Arce** and N. C. Gallagher, "BTC Image Source Coding," Proceedings of the *1981 Annual Allerton Conference on Communications, Control, and Computing*, Urbana IL, October 1981.
174. **G. R. Arce** and N. C. Gallagher, "Stochastic Analysis for Multilevel Root Signals of Median Filters," Proceedings of the *16th Annual Conference on Information Sciences*, Princeton NJ, March 1982.