Curriculum Vitae – Arnold Lee Swindlehurst

Education

1991, Ph.D., Stanford University, Electrical Engineering. Thesis advisor: Prof. Thomas Kailath. Dissertation title: "Applications of Subspace Fitting to Estimation and Identification." Dissertation research was in the general area of parametric estimation theory, with applications to eigenstructure based methods for sensor array processing, spectral estimation, and system identification. Specific research emphasis included exploitation of regular sensor array structure for near- and far-field source location, effects of array perturbations on algorithm performance, and geometric methods for state-space system identification. Coursework emphasis: Signal Processing, Detection and Estimation Theory, Communications, Linear Systems and Control, System Identification, Matrix Theory.

1985, 1986, B.S. (summa cum laude), M.S., Brigham Young University, Electrical Engineering. Master's Thesis advisor: Prof. Wynn Stirling. Thesis title: "Analysis of a Multivariate Empirical Bayes Classifier." Course GPA of 3.96 on 4.0 scale. Coursework emphasis in Digital and Analog Signal Processing, Communication Systems, Linear Systems, and Mathematics.

Employment

2014-Present   Hans Fischer Senior Fellow, Institute for Advanced Studies, Technische Universität München, Munich, Germany. Conducting research with faculty and students at IAS and TUM on projects related to multi-antenna wireless communication and positioning systems.

2013-Present   Associate Dean for Research and Graduate Studies, Henry Samueli School of Engineering, University of California at Irvine, Irvine, CA. Responsible for administering graduate and professional programs of study in terms of recruitment, retention and graduate student well-being, monitoring graduate student progress and quality, facilitating faculty opportunities for extramural funding, supporting technology transfer efforts, managing research centers and institutes, and enhancing the visibility and outreach of the School's research enterprise.

2009-2013   Associate Chair, Dept. of Electrical Engineering & Computer Science, University of California at Irvine, Irvine, CA. Responsible for all aspects of the UCI undergraduate Electrical Engineering program, including teaching assignments, ABET accreditation, advisement, curriculum issues, course substitutions, etc. Organized a major revision of the EE curriculum during 2009-11, which was approved for the freshman class of 2012.

2007-Present   Professor, Dept. of Electrical Engineering & Computer Science, University of California at Irvine, Irvine, CA. Tenured academic position involving research, teaching, and various other administrative duties. Primary areas of research interest: signal processing and estimation theory, applications to wireless communications, geo-positioning, radar, sonar, *etc.* Active in IEEE Signal Processing Society affairs as an Editor-in-Chief (*IEEE Journal of Selected Topics in Signal Processing*), Associate Editor (*IEEE Transactions on Signal Processing, Signal Processing Magazine, EURASIP Journal on Wireless Communications & Networking*), reviewer, conference organizer, session chair, etc.

2006-2007   Vice-President of Research, ArrayComm LLC, San Jose, CA. On personal development leave from Brigham Young University. Responsible for all research activities at

ArrayComm, including new algorithm development, testing, software implementation and testing. Manages a staff of 17 engineers working on advanced techniques for MIMO wireless communications, channel estimation, equalization, interference cancellation in various wireless protocols including 802.16e (WiMAX), 3GPP, PHS, GSM, S-DMB, etc.

2003-2006   Chair, Dept. of Electrical & Computer Engineering, Brigham Young University, Provo, Utah. Responsible for all operations of a 25-faculty, 850-student department (approximately 750 undergraduate and 100 graduate student), including oversight of undergraduate and graduate curriculum, admissions, faculty hiring and retention, external relations, office and technical staff, and department budgets.

2001-2007   Professor, Dept. of Electrical & Computer Engineering, Brigham Young University, Provo, Utah. Tenured academic position involving research, teaching, and various other administrative duties. Taught courses in Circuit Theory, Digital Electronics, Feedback Control Systems, Signals and Systems, Linear System Theory, Optimal Control, Detection and Estimation Theory, Array Signal Processing, Wireless Communications and System Identification. Served as both a member and chair of the department's Graduate Committee, which is responsible for establishment and enforcement of graduate school policies, graduate student admissions, and coordination of all graduate curriculum.

1997-2001   Associate Professor, Dept. of Electrical & Computer Engineering, Brigham Young University, Provo, Utah.

1996-1997   Visiting Professor, Joint Appointment at Uppsala University, Uppsala, Sweden, and at the Royal Institute of Technology, Stockholm, Sweden. Position held while on sabbatical leave from BYU. Taught a course entitled "Fundamentals of Signal Estimation Using Antenna Arrays" at both universities. Collaborated with several students and faculty at both universities on projects in radar and wireless communications. Gave seminars at various other universities and high-tech companies in Sweden and Finland.

1990-1996   Assistant Professor, Dept. of Electrical & Computer Engineering, Brigham Young University, Provo, Utah. Tenure-track position involving research, teaching, and various administrative duties. Conducted research as described above. Responsible for the development and coordination of all departmental courses in linear systems and control theory. Developed and taught two new graduate courses: ECEn 611 – Optimal Control Theory, and ECEn 612 – System Identification. Responsible for the evaluation, purchase, and supervision of all hardware and software for departmental PC and UNIX based computer systems. Oversaw the purchase or donation of over $1,000,000 worth of computer equipment. Managed a staff of three technicians responsible for the maintenance of all department computer systems.

1988-1990   Research Assistant, Dept. of Electrical Engineering, Stanford University. Conducted research for PhD dissertation, as described below. Reviewed articles for a number of professional journals. Wrote proposals and reports for research contracts with various governmental agencies.

1986-1990   Electrical Engineer, ESL, Inc., Sunnyvale, California. Involved in the development of algorithms and architectures for a variety of radar and sonar signal processing applications, including airborne direction-finding, underwater target detection and tracking, and bistatic radar source localization. Managed two multi-year projects, one in ELF signal search and

data processing, the other in underwater acoustic signal analysis. Also designed and built several small, special-purpose hardware modules for a radar data processing workstation.

1983-1986 Research Assistant, Department of Electrical Engineering, Brigham Young University, Provo, Utah. Involved in the following projects: implementation of a telephone spread spectrum communication system, development of sonar display normalization techniques, analysis of integer computation effects in FFTs, and thesis research in the area of empirical Bayes pattern classification techniques.

1983-1984 Scientific Programmer, Eyring Research Institute of Provo, Utah. Wrote software and documentation for Minuteman missile simulation and trajectory prediction system.

Consulting Activities

- ESL, Inc., Sunnyvale, CA (consultant, 1990-92)

- E-Systems Corporation, Greenville, TX (consultant, 1993-94)

- Statistical Signal Processing, Inc., Napa, CA (consultant, 1993-94)

- San Diego Research Center, Inc., San Diego, CA (consultant, 2003-06)

- Tallwood Venture Capital, Palo Alto, CA (consultant, 2010)

- Sierra Nevada Corporation, Irvine, CA (consultant, 2010-11)

- *Vantage Controls Inc. vs. Lutron Electronics Co., Inc.*, Case No. 2:03-CV-00488TC, US District Court, District of Utah (expert witness, deposition taken, 2005)

- *Lutron Electronics Co., Inc., vs. Control4 Corporation*, Case No. 2:06-CV-00401 DAK, US District Court, District of Utah (expert witness, deposition taken, 2008)

- *Lutron Electronics Co., Inc., vs. Crestron Electronics Inc.*, Case No. 2:09-CV-707-CW-EJF, US District Court, District of Utah (expert witness, deposition taken, 2012)

Honors and Awards

- 2014 Hans Fischer Senior Fellowship, Institute for Advanced Studies, Technische Universität München.

- 2010 IEEE Signal Processing Society Best Paper Award with Quentin Spencer and Martin Haardt for "Zero-Forcing Methods for Downlink Spatial Multiplexing in Multi-User MIMO Channels," *IEEE Transactions on Signal Processing*, February, 2004.

- 2006 IEEE Communications Society Stephen O. Rice Prize in the Field of Communications Theory for the two-part paper "A Vector-Perturbation Technique for Near-Capacity Multiantenna Multiuser Communication," *IEEE Transactions on Communications*, January-March, 2005, co-authored with Dr. Christian Peel and Dr. Bert Hochwald.

- 2006 IEEE Signal Processing Society Best Paper Award with Geert Leus for "Blind and Semi-Blind Equalization for Generalized Space-Time Block Codes," *IEEE Transactions on Signal Processing*, October, 2002.

- Engineering Educator Award, Department of Electrical & Computer Engineering, Brigham Young University, 2005 (annual award voted by students to department's outstanding teacher).

- Karl G. Maeser Research and Creative Arts Award, Brigham Young University, 2004 (annual award given to university's outstanding researcher).

- Elevated to Fellow of the Institute of Electrical and Electronics Engineers, 2004.

- Co-author of "Spatial Signature Estimation for Uniform Linear Arrays with Unknown Receiver Gains and Phases," *IEEE Trans. on Signal Processing*, August, 1999, which received the 2001 IEEE Signal Processing Society's Young Author Best Paper Award (primary author: David Asztély, co-author: Björn Ottersten).

- 2000 IEEE W. R. G. Baker Prize Paper Award with Petre Stoica for "Maximum Likelihood Methods in Radar Array Signal Processing," *IEEE Proceedings*, February, 1998.

- 1998 Outstanding Faculty Award, Department of Electrical & Computer Engineering, Brigham Young University.

- 1986 Outstanding Thesis, College of Engineering and Technology, Brigham Young University.

- 1985-1988 Office of Naval Research Graduate Fellowship.

Professional Activities

- Special Guest Editor, *IEEE Journal of Selected Topics in Signal Processing*, for special issue on "Signal Processing for Large-Scale MIMO," October, 2014.

- Special Guest Editor, *IEEE Journal on Selected Areas in Communications*, for special issue on "Signal Processing Techniques for Wireless Physical Layer Security," September, 2013.

- Member, Awards Board, *IEEE Signal Processing Society*, 2012-present.

- Co-organizer and Technical Program Co-Chair, *4th IEEE International Workshop on Computational Advances in Multi-Sensor Adaptive Processing*, held Dec. 2011 in San Juan, Puerto Rico (approximately 120 accepted papers).

- Member, Sensor Array and Multichannel (SAM) Signal Processing Technical Committee, *IEEE Signal Processing Society*, 2010-present.

- Member, Nominations and Appointments Committee, *IEEE Signal Processing Society*, 2010-present.

- Co-organizer and Co-Technical Program Chair, *IEEE International Conference on Acoustics, Speech and Signal Processing*, held April 2008 in Las Vegas, NV (over 2800 submissions, 1400 accepted papers).

- Founding Editor-in-Chief, *IEEE Journal on Selected Topics in Signal Processing*, 2006-2009.

- Member, Editorial Board, *IEEE Signal Processing Magazine*, 2006-2009.

- Special Guest Editor, *IEEE Signal Processing Magazine*, for special issue on "Signal Processing for Positioning and Navigation" which appeared in 2005.

- Associate Editor, *EURASIP Journal on Wireless Communications and Networking*, 2003-2010. Organized a special session of the journal on "Multi-User MIMO Networks" in 2004.

- Member, Sensor Array and Multichannel (SAM) Signal Processing Technical Committee, *IEEE Signal Processing Society*, 2003-2006.

- Secretary, *IEEE Signal Processing Society*. Elected to term beginning January 1, 2002, and ending December 31, 2004. Voting member of the Signal Processing Society's Board of Govenors and Executive Committee. Liaison with appointed representatives to other organizations.

- Co-organizer and Technical Program Chair, *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, held May 2001, in Salt Lake City, Utah (over 2000 submissions, 1000 accepted papers).

- Member and Vice-Chair, Signal Processing for Communications (SPCOM) Technical Committee, *IEEE Signal Processing Society*, 1998-2000.

- Associate Editor, *IEEE Transactions on Signal Processing*, 1995-1997.

- President and co-Founder, Utah Chapter of the *IEEE Signal Processing* and *IEEE Communications* societies, 1994-1996.

- Co-organizer and Technical Program Chair, *IEEE Digital Signal Processing Workshop*, held August, 1998, at Ruby's Inn near Bryce Canyon, Utah (approximately 220 submissions).

- Member, Statistical Signal and Array Processing (SSAP) Technical Committee, *IEEE Signal Processing Society*, 1996-1998.

- Problems editor for 3$^{\text{rd}}$ edition of *Feedback Control of Dynamic Systems* by Franklin, Powell, and Emami-Naeini; Addison-Wesley Publishing. Coordinated the work of the authors and external contributors in augmenting and revising all problem sets for the textbook.

- Reviewer for numerous textbooks, research monographs, IEEE journals, and IEEE conferences.

- Member of Technical Program Committee for numerous IEEE conferences.

Research Grants

Items in the list below that are preceded by * indicate grants for which Prof. Swindlehurst was the Principal Investigator.

*2015-2018 National Science Foundation: "Millimeter Wave Massive MIMO: A New Frontier for Enhanced Radio Access" ($633,000)

*2012-2013 California-Catalonia Engineering Innovation Program: "Multicarrier Signals for Combined Positioning and Communications Systems: Contributions to Positioning in LTE" ($12,500)

*2011-2014 National Science Foundation: "Jamming in Wireless Networks: Offensive Strategies and Cooperation" ($368,940)

*2011-2012 California-Catalonia Engineering Innovation Program: "Multicarrier Signals for Combined Positioning and Communications Systems: Contributions to Scheduling and Synchronization in LTE" ($40,000)

*2010-2011 California-Catalonia Engineering Innovation Program: "Multicarrier Signals for Combined Positioning and Communications Systems: Design and Implementation Aspects" ($41,000)

2010-2013 Air Force Office of Scientific Research: "NetSense: Optimizing Network Configuration for Sensing" ($584,687)

*2009-2011 Dynetics, Inc: "Integrated Multi-Modal RF Sensing" ($187,300)

*2009-2010 California-Catalonia Engineering Innovation Program: "Signal Design for Combined Positioning and Communications Systems" ($35,000)

*2009-2013 National Science Foundation: "Physical Layer Optimization for Cognitive Sensor Networks" ($305,948)

2007-2012 Army Research Office, Multidisciplinary University Research Initiative (MURI, subcontract through University of Calfornia at Davis): "ARSENAL: A cross layer ARchitecture for SEcure resilieNt tacticAL mobile ad hoc networks" ($490,000)

*2004-2009 National Science Foundation: "Distributed Control and Communications for Multiple Miniature Unmanned Air Vehicles" ($1,109,475)

2004-2009 Army Research Office, Multidisciplinary University Research Initiative (MURI, subcontract through University of California at San Diego): "Directional Routing and Scheduling for Secure Mobile Ad-Hoc Networks" ($627,713)

*2003-2007 National Science Foundation: "Multi-user, Multi-antenna Networks: Achieving High Capacity in a Mutual Interference Environment" ($354,042)

*2000-2004 National Science Foundation: "Analysis of the Capacity Improvement for Wireless Networks with Multiple Transmit and Receive Antennas" ($499,761)

*2000-2003 National Science Foundation: "Development of a Comprehensive Real-Time Instrument for MIMO Wireless Channel Measurement and Space-Time Coding Implementation" ($370,567)

*2000-2002 Office of Naval Research: "Parametric Methods for Range-Varying and Hot Clutter Mitigation" ($183,512)

*1999-2002 National Science Foundation: "Modeling and Design for the Lower Layers of 4th Generation Indoor/Outdoor Wireless Networks" ($697,636)

*1999 Office of Naval Research: "Parametric Methods for Interference and Calibration Error Mitigation in Circular Array STAP" ($60,313)

*1996-1998 Office of Naval Research: "Spatio-Temporal Signal Processing in Severe Environments" ($145,000)

*1995-1997 National Science Foundation: "Analysis and Development of Algorithms for Antenna Array Based Communication Systems" ($99,731)

*1995-1996 National Security Agency, Center for Research in Applied Signal Processing: "Blind Equalization of Multipath Channels Using a Narrowband Antenna Array" ($18,000)

*1991-1994 National Science Foundation Research Initiation Award: "Subspace Fitting Algorithms for State Space System Identification" ($60,000)

*1992 National Science Foundation: "Research Initiation Equipment Supplement" ($10,000, awarded to support NSF research outlined above)

*1992 Space Dynamics Laboratory: "Algorithm Development for SPIRIT III Data Processing Center" ($55,749)

*1991-1992 ESL, Inc.: "High Resolution Direction Finding: Algorithms and Analysis" ($29,511)

Publication List

Peer-Reviewed Journal Articles

[J1] W.C. Stirling and A.L. Swindlehurst, "Decision-Directed Multivariate Empirical Bayes Classification with Nonstationary Priors," *IEEE Trans. on Pattern Analysis and Machine Intelligence*, Vol. PAM-9, No. 5, pp. 644-680, Sept., 1987.

[J2] A. Swindlehurst and T. Kailath, "On the Sensitivity of the ESPRIT Algorithm to Non-Identical Subarrays," *Sādhanā, Indian Academy of Sciences Proc. in Eng. Sciences*, Vol. 15, Part 3, pp. 197-212, Nov., 1990.

[J3] A. Swindlehurst, B. Ottersten, R. Roy, and T. Kailath, "Multiple Invariance ESPRIT," *IEEE Trans. Signal Processing*, Vol. 40, No. 4, pp. 867-881, April, 1992.

[J4] A. Swindlehurst and T. Kailath, "A Performance Analysis of Subspace-Based Methods in the Presence of Modeling Errors - Part I: The MUSIC Algorithm," *IEEE Trans. Signal Processing*, Vol. 40, No. 7, pp. 1758-1774, July, 1992.

[J5] A. Swindlehurst, "DOA Identifiability for Rotationally Invariant Arrays," *IEEE Trans. Signal Processing*, Vol. 40, No. 7, pp. 1825-1828, July, 1992.

[J6] A. Swindlehurst and T. Kailath, "Algorithms for Azimuth/Elevation Direction Finding Using Regular Array Geometries," *IEEE Trans. on Aerospace and Electronic Sys.*, Vol. 29, No. 1, pp. 145-156, Jan., 1993.

[J7] A. Swindlehurst and T. Kailath, "A Performance Analysis of Subspace-Based Methods in the Presence of Modeling Errors - Part II: Multidimensional Algorithms," *IEEE Trans. Signal Processing*, Vol. 41, No. 9, pp. 2882-2890, Sept., 1993.

[J8] A. van der Veen, E. Deprettere, and A. Swindlehurst, "Subspace Based Signal Analysis using Singular Value Decomposition," *Proc. IEEE*, Vol. 81, No. 9, pp. 1277-1308, Sept., 1993.

[J9] A. Swindlehurst and M. Viberg, "Subspace Fitting with Diversely Polarized Antenna Arrays," *IEEE Trans. on Antennas and Propagation*, Vol. 41, No. 12, pp. 1687-1694, Dec., 1993.

[J10] A. Swindlehurst and J. Yang, "Using Least-Squares to Improve Blind Signal Copy Performance," *IEEE Signal Processing Letters*, Vol. 1, No. 5, pp. 80-82, May, 1994.

[J11] M. Viberg and A. Swindlehurst, "Analysis of the Combined Effects of Finite Samples and Model Errors on Array Processing Performance," *IEEE Trans. Signal Processing*, Vol. 42, No. 11, pp. 3073-3083, Nov., 1994.

[J12] A. Swindlehurst, "Alternative Algorithm for Maximum Likelihood DOA Estimation and Detection," *IEE Proc. F – Radar and Signal Processing*, Vol. 141, No. 6, pp. 293-299, Dec., 1994.

[J13] M. Viberg and A. Swindlehurst, "A Bayesian Approach to Auto-Calibration for Parametric Array Signal Processing," *IEEE Trans. Signal Processing*, Vol. 42, No. 12, pp. 3495-3507, Dec., 1994.

[J14] A. Swindlehurst, R. Roy, B. Ottersten, and T. Kailath, "A Subspace Fitting Approach for Identification of Linear State Space Models," *IEEE Trans. Automatic Control*, Vol. 40, No. 2, pp. 311-316, Feb., 1995.

[J15] J. Yang and A. Swindlehurst, "The Effects of Array Calibration Errors on DF-Based Signal Copy Performance," *IEEE Trans. Signal Processing*, Vol. 43, No. 11, pp. 2724-2732, Nov., 1995.

[J16] A. Swindlehurst, S. Daas, and J. Yang, "Analysis of a Decision-Directed Beamformer," *IEEE Trans. Signal Processing*, Vol. 43, No. 12, pp. 2920-2927, Dec., 1995.

[J17] A. Swindlehurst, "Detection and Estimation in the Presence of Signals with Uncalibrated Spatial Signature," *Signal Processing*, Vol. 50, No. 1-2, pp. 29-37, April, 1996.

[J18] A. Swindlehurst, "Normalized Adaptive Decision Directed Equalization," *IEEE Signal Processing Letters*, Vol. 5, No. 1, pp. 18-20, Jan., 1998.

[J19] A. Swindlehurst and P. Stoica, "Maximum Likelihood Methods in Radar Array Signal Processing," *Proc. IEEE*, Vol. 86, No. 2, pp. 421-441, Feb., 1998. **(Received 2000 IEEE W.R.G. Baker Prize Paper Award).**

[J20] A. Swindlehurst, "Time Delay and Spatial Signature Estimation Using Known Asynchronous Signals," *IEEE Trans. Signal Processing*, Vol. 46, No. 2, pp. 449-462, Feb., 1998.

[J21] D. Asztély, B. Ottersten, and A. Swindlehurst, "A Generalized Array Manifold Model for Communication Channels with Local Scattering," *IEE Proceedings, Radar, Sonar, & Navigation*, Vol. 145, No. 1, pp. 51-57, Feb., 1998.

[J22] M. Jansson, A. Swindlehurst, and B. Ottersten, "Weighted Subspace Fitting for General Array Error Models," *IEEE Trans. Signal Processing*, Vol. 46, No. 9, pp. 2484-2498, Sept., 1998.

[J23] A. Jakobsson, A. Swindlehurst, and P. Stoica, "Subspace-Based Estimation of Time Delays and Doppler Shifts," *IEEE Trans. Signal Processing*, Vol. 46, No. 9, pp. 2472-2483, Sept., 1998.

[J24] A. Swindlehurst, "Sensor Array Signal Processing," *IEEE Signal Processing Magazine*, Vol. 15, No. 5, pp. 45-48, Sept., 1998.

[J25] J. Sorelius, R. Moses, T. Söderström, and A. Swindlehurst, "Effects of Non-Zero Bandwidth on Direction of Arrival Estimators in Array Signal Processing," *IEE Proceedings, Radar, Sonar, & Navigation*, Vol. 145, No. 6, pp. 317-324, Dec., 1998.

[J26] B. Ottersten and A. Swindlehurst, "Antenna Arrays for Wireless Networks," *IEEE Signal Processing Magazine*, Vol. 16, No. 2, pp. 25-27, March, 1999.

[J27] A. Swindlehurst and J. Gunther, "Methods for Blind Equalization and Resolution of Overlapping Echoes of Unknown Shape," *IEEE Trans. Signal Processing*, Vol. 47, No. 5, pp. 1245-1254, May, 1999.

[J28] P. Stoica, A. Jakobsson, and A. Swindlehurst, "On the Identifiability of Multipath Parameters," *Signal Processing*, Vol. 74, No. 3, pp. 327-330, May, 1999.

[J29] D. Asztély, A. Swindlehurst, and B. Ottersten, "Spatial Signature Estimation for Uniform Linear Arrays with Unknown Receiver Gains and Phases," *IEEE Trans. Signal Processing*, Vol. 47, No. 8, pp. 2128-2138, Aug., 1999. **(Received 2001 *IEEE Signal Processing Society* Young Author Best Paper Award).**

[J30] Q. Spencer, B. Jeffs, M. Jensen, and A. Swindlehurst, "Modeling the Statistical Time and Angle of Arrival Characteristics of an Indoor Multipath Channel," *IEEE Journal on Selected Areas in Comm.*, Vol. 18, No. 3, pp. 347-360, March, 2000.

[J31] J. Gunther and A. Swindlehurst, "On the Use of Kernel Structure for Blind Equalization," *IEEE Trans. Signal Processing*, Vol. 48, No. 3, pp. 799-809, March, 2000.

[J32] J. Gunther and A. Swindlehurst, "Recursive Blind Symbol Estimation of Convolutionally Coded Co-Channel Signals," *IEEE Trans. Signal Processing*, Vol. 48, No. 4, pp. 956-965, April, 2000.

[J33] G. Seco, J. Fernández-Rubio, and A. Swindlehurst, "Code-Timing Synchronization in DS-CDMA Systems Using Space-Time Diversity," *Signal Processing*, Vol. 81, pp. 1581-1602, Aug., 2001.

[J34] A. Swindlehurst, P. Stoica, and M. Jansson, "Exploiting Arrays with Multiple Invariances Using MUSIC and MODE," *IEEE Trans. Signal Processing*, Vol. 49, No. 11, pp. 2511-2521, Nov., 2001.

[J35] A. Swindlehurst and G. Leus, "Blind and Semi-Blind Equalization for Generalized Space-Time Block Codes," *IEEE Trans. Signal Processing*, Vol. 50, No. 10, pp. 2489-2498, Oct., 2002. **(Received 2006 *IEEE Signal Processing Society* Best Paper Award).**

[J36] J. Wallace, M. Jensen, A. Swindlehurst, and B. Jeffs, "Experimental Characterization of the MIMO Wireless Channel: Data Acquisition and Analysis," *IEEE Trans. Wireless Communications*, Vol. 2, No. 2, pp. 335-343, March, 2003.

[J37] P. Parker and A. Swindlehurst, "Space-Time Auto-Regressive Filtering for Matched Subspace STAP," *IEEE Trans. Aerospace & Electronic Systems*, Vol. 39, No. 2, pp. 510-520, April, 2003.

[J38] C. Peel and A. Swindlehurst, "Effective SNR for Space-Time Modulation Over a Time-Varying Rician Channel," *IEEE Trans. Communications*, Vol. 52, No. 1, pp. 17-23, Jan., 2004.

[J39] Q. Spencer, A. Swindlehurst and M. Haardt, "Zero-Forcing Methods for Downlink Spatial Multiplexing in Multi-User MIMO Channels," *IEEE Trans. Signal Processing*, Vol. 52, No. 2, pp. 461-471, Feb., 2004. **(Received 2010 *IEEE Signal Processing Society* Best Paper Award).**

[J40] C. Peel and A. Swindlehurst, "Performance of Space-Time Modulation for a Generalized Time-Varying Rician Channel Model," *IEEE Trans. Wireless Communications*, Vol. 3, No. 3, pp. 1003-1012, May, 2004.

[J41] Q. Spencer, C. Peel, A. Swindlehurst and M. Haardt, "An Introduction to the Multi-User MIMO Downlink," *IEEE Communications Magazine*, Vol. 42, No. 10, pp. 60-67, Oct., 2004.

[J42] Q. Spencer, T. Svantesson and A. Swindlehurst, "Performance of MIMO Spatial Multiplexing Algorithms Using Indoor Channel Measurements and Models," *Wireless Communications and Mobile Computing*, Vol. 4, No. 7, pp. 739-754, Nov., 2004.

[J43] Q. Spencer and A. Swindlehurst, "A Hybrid Approach to Spatial Multiplexing in Multi-User MIMO Downlinks," *EURASIP Journal on Wireless Communications and Networking*, Vol. 2004, Article ID 960305, 12 pages, Dec., 2004.

[J44] C. Peel, B. Hochwald, and A. Swindlehurst, "A Vector-Perturbation Technique for Near-Capacity Multi-Antenna Multi-User Communication – Part I: Channel Inversion and Regularization," *IEEE Trans. Communications*, Vol. 53, No. 1, pp. 195-202, Jan., 2005. **(Together with [J45], received the 2006 *IEEE Communications Society* Stephen O. Rice Prize in the Field of Communications Theory).**

[J45] B. Hochwald, C. Peel, and A. Swindlehurst, "A Vector-Perturbation Technique for Near-Capacity Multi-Antenna Multi-User Communication – Part II: Perturbation," *IEEE Trans. Communications*, Vol. 53, No. 3, pp. 537-544, March, 2005.

[J46] T. Svantesson and A. Swindlehurst, "A Performance Bound for Prediction of MIMO Channels," *IEEE Trans. Signal Processing*, Vol. 54, No. 2, pp. 520-529, Feb., 2006.

[J47] M. Zorzi, J. Zeidler, A. Anderson, A. Swindlehurst, M. Jensen, S. Krishnamurthy, B. Rao, J. Proakis, "Cross-Layer Issues in MAC Protocol Design for MIMO ad hoc Networks," *IEEE Wireless Communications Magazine*, Vol. 13, No. 4, pp. 62-76, Aug., 2006.

[J48] C. Peel and A. Swindlehurst, "Throughput-Optimal Training for a Time-Varying Multi-Antenna Channel," *IEEE Trans. Wireless Communications*, Vol. 6, No. 9, pp. 3364-3373, Sept., 2007.

[J49] Y. Rong, Y. Hua, A. Swami and A. Swindlehurst, "Space-Time Power Schedule for Distributed MIMO Links without Instantaneous Channel State Information at the Transmitting Nodes," *IEEE Trans. Signal Processing*, Vol. 56, No. 2, pp. 686-701, Feb., 2008.

[J50] M. Larsen, A. Swindlehurst and T. Svantesson, "Performance Bounds for MIMO-OFDM Channel Estimation," *IEEE Trans. Signal Processing*, Vol. 57, No. 5, pp. 1901-1916, May, 2009.

[J51] M. Nokleby and A. Swindlehurst, "Bargaining and MISO Interference Channel," *EURASIP Journal of Applied Signal Processing*, Vol. 2009, Article ID 368547, 13 pages, 2009.

[J52] Z. Han, A. Swindlehurst and K. J. R. Liu, "Optimization of MANET Connectivity via Smart Deployment/Movement of Unmanned Air Vehicles" *IEEE Trans. Vehicular Technology*, Vol. 58, No. 7, pp. 3533-3546, Sept., 2009.

[J53] P. Zhan, D. Casbeer and A. Swindlehurst, "Adaptive Mobile Sensor Positioning for Multi-Static Target Tracking," *IEEE Trans. Aerospace & Electronic Systems*, Vol. 46, No. 1, pp. 120-132, Jan., 2010.

[J54] A. Mukherjee and A. Swindlehurst, "Robust Beamforming for Security in MIMO Wiretap Channels with Imperfect CSI," *IEEE Trans. Signal Processing*, Vol. 59, No. 1, pp. 351-361, Jan. 2011.

[J55] P. Zhan, K. Yu and A. Swindlehurst, "Wireless Relay Communications with Unmanned Aerial Vehicles: Performance and Optimization," *IEEE Trans. Aerospace & Electronic Systems*, Vol. 47, No. 3, pp. 2068-2085, July, 2011.

[J56] F. Antreich, J. Nossek, G. Seco-Granados and A. Swindlehurst, "The Extended Invariance Principle for Signal Parameter Estimation in an Unknown Spatial Field," *IEEE Trans. Signal Processing*, Vol. 59, No. 7, pp. 3213-3225, July, 2011.

[J57] A. Fakoorian and A. Swindlehurst, "MIMO Interference Channel with Confidential Messages: Achievable Secrecy Rates and Precoder Design," *IEEE Trans. Information Forensics*, Vol. 6, No. 3, pp. 640-649, Sept., 2011.

[J58] A. Fakoorian and A. Swindlehurst, "Solutions for the MIMO Gaussian Wiretap Channel with a Cooperative Jammer," *IEEE Trans. Signal Processing*, Vol. 59, No. 10, pp. 5013-5022, Oct., 2011.

[J59] J. Huang and A. Swindlehurst, "Cooperative Jamming for Secure Communications in MIMO Relay Networks," *IEEE Trans. Signal Processing*, Vol. 59, No. 10, pp. 4871-4884, Oct., 2011.

[J60] J. Huang and A. Swindlehurst, "Robust Secure Transmission in MISO Channels Based on Worst-Case Optimization," *IEEE Trans. Signal Processing*, Vol. 60, No. 4, pp. 1696-1707, April, 2012.

[J61] J. Chen and A. Swindlehurst, "Applying Bargaining Solutions to Resource Allocation in Multiuser MIMO-OFDMA Broadcast Systems," *IEEE Journal Sel. Topics in Signal Processing*, Vol. 6, No. 2, pp. 127-139, April, 2012.

[J62] A. Mukherjee and A. Swindlehurst, "Modified Waterfilling Algorithms for MIMO Spatial Multiplexing with Asymmetric CSI," *IEEE Wireless Comm. Letters*, Vol. 1, No. 2, pp. 89-92, April, 2012.

[J63] F. Jiang, J. Wang and A. Swindlehurst, "Interference-Aware Scheduling for Connectivity in MIMO Ad Hoc Multicast Networks," *IEEE Trans. Vehicular Technology*, Volume 61, No. 4, pp. 1762-1778, May, 2012.

[J64] S.-C. Wu, A. Swindlehurst, P. Wang and Z. Nenadic, "Projection vs. Prewhitening for EEG Interference Suppression," *IEEE Trans. Biomedical Engineering*, Vol. 59, No. 5, pp. 1329-1338, May, 2012.

[J65] S.-C. Wu, A. Swindlehurst, P. Wang and Z. Nenadic, "Efficient Dipole Parameter Estimation in EEG Systems with Near-ML Performance," *IEEE Trans. Biomedical Engineering*, Vol. 59, No. 5, pp. 1339-1348, May, 2012.

[J66] F. Jiang and A. Swindlehurst, "Optimization of UAV Heading for the Ground-to-Air Uplink," *IEEE J. of Sel. Areas in Communications*, Vol. 30, No. 5, pp. 993-1005, June, 2012.

[J67] A. Mukherjee and A. Swindlehurst, "Jamming Games in the MIMO Wiretap Channel with an Active Eavesdropper," *IEEE Trans. Signal Processing*, Vol. 61, No. 1, pp. 82-91, Jan. 2013.

[J68] A. Fakoorian and A. Swindlehurst, "Competing for Secrecy in the MISO Interference Channel," *IEEE Trans. Signal Processing*, Vol. 61, No. 1, pp. 170-181, Jan. 2013.

[J69] J. López-Salcedo, E. Gutiérrez, G. Seco-Granados, and A. Swindlehurst, "Unified Framework for the Synchronization of Flexible Multicarrier Communication Signals," *IEEE Trans. Signal Processing*, Vol. 61, No. 4, Feb. 2013.

[J70] A. Mukherjee and A. Swindlehurst, "Prescient Precoding in Heterogeneous DSA Networks with Both Underlay and Interweave MIMO Cognitive Radios," *IEEE Trans. Wireless Communications*, Vol. 12, No. 5, pp. 2252-2260, May 2013.

[J71] J. Huang, A. Mukherjee and A. Swindlehurst, "Secure Communication via an Untrusted Non-Regenerative Relay in Fading Channels," *IEEE Trans. Signal Processing*, Vol. 61, No. 10, pp. 2536-2550, May 2013.

[J72] A. Fakoorian and A. Swindlehurst, "Full Rank Solutions for the MIMO Gaussian Wiretap Channel with an Average Power Constraint," *IEEE Trans. Signal Processing*, Vol. 61, No. 10, pp. 2620-2631, May 2013.

[J73] S.-C. Wu and A. Swindlehurst, "Algorithms and Bounds for Dynamic Causal Modeling of Brain Connectivity," *IEEE Trans. Signal Processing*, Vol. 61, No. 11, pp. 2990-3001, June 2013.

[J74] F. Jiang, J. Chen and A. Swindlehurst, "Estimation in Phase-Shift and Forward Wireless Sensor Networks," *IEEE Trans. Signal Processing*, Vol. 61, No. 15, pp. 3840-3851, Aug. 2013.

[J75] S.-C. Wu and A. Swindlehurst, "Matching Pursuit and Source Deflation for Sparse EEG/MEG Dipole Moment Estimation," *IEEE Trans. Biomedical Engineering*, Vol. 60, No. 8, pp. 2280–2288, Aug. 2013.

[J76] A. Fakoorian and A. Swindlehurst, "On the Optimality of Linear Precoding for Secrecy in the MIMO Broadcast Channel," *IEEE J. of Sel. Areas in Communications*, Vol. 31, No. 9, pp. 1701–1713, Sept. 2013.

[J77] M. Pei, D. Ma, J. Wei and A. Swindlehurst, "On Ergodic Secrecy Rate for MISO Wiretap Broadcast Channels with Opportunistic Scheduling," *IEEE Communications Letters*, Vol. 18, No. 1, pp. 50–53, Jan. 2014.

[J78] M. Pei, A. Swindlehurst, D. Ma and J. Wei, "Adaptive Limited Feedback for MISO Wiretap Channels with Cooperative Jamming," *IEEE Trans. Signal Processing*, Vol. 62, No. 4, pp. 993–1004, Feb. 2014.

[J79] A. Mukherjee, A. Fakoorian, J. Huang and A. Swindlehurst, "Principles of Physical Layer Security in Multiuser Wireless Networks: A Survey," *IEEE Communications Surveys and Tutorials*, Feb. 2014.

[J80] D. Zhu, J. Wang, A. Swindlehurst and C. Zhao, "Downlink Resource Reuse for Device-to-Device Communications Underlaying Cellular Networks," *IEEE Signal Processing Letters*, Vol. 21, No. 5, pp. 531-534, May 2014.

[J81] F. Jiang, J. Chen and A. Swindlehurst, "Optimal Power Allocation for Parameter Tracking in a Distributed Amplify-and-Forward Sensor Network," *IEEE Trans. Signal Processing*, Vol. 62, No. 9, pp. 2200-2211, May 2014.

[J82] J. Huang and A. Swindlehurst, "Buffer-Aided Relaying for Two-Hop Secure Communication," *IEEE Trans. Information Forensics and Security*, Vol. 14, No. 1, pp. 152-164, July 2014.

[J83] A. Swindlehurst, E. Ayanoglu, P. Heydari and F. Capolino, "Millimeter Wave Massive MIMO: The Next Wireless Revolution?" *IEEE Communications Magazine*, Vol. 52, No. 9, pp. 56-62, September 2014.

[J84] L. Lu, G. Li, A. Swindlehurst, A. Ashikhmin and R. Zhang, "An Overview of Massive MIMO: Benefits and Challenges," *IEEE J. Sel. Topics in Sig. Proc.*, Vol. 8, No. 5, pp. 742-758, October 2014.

[J85] H. Hui, A. Swindlehurst, G. Li and J. Liang, "Secure Relay and Jammer Selection for Physical Layer Security," *IEEE Signal Processing Letters*, Vol. 22, No. 8, pp. 1147-1151, January 2015.

[J86] F. Jiang, J. Chen, A. Swindlehurst and J. López-Salcedo, "Massive MIMO for Wireless Sensing with a Coherent Multiple Access Channel," *IEEE Trans. Signal Processing*, Vol. 63, No. 12, pp. 3005-3017, March 2015.

[J87] S. C. Wu, A. Swindlehurst and Z. Nenadic, "A Novel Framework for Feature Extraction in Multi-Sensor Action Potential Sorting," *Journal of Neuroscience Methods*, Vol. 253, pp. 262-271, Sept. 2015.

[J88] K. An, M. Lin, T. Liang, J.-B. Wang, J. Wang, Y. Huang and A. Swindlehurst, "Performance Analysis of Multi-Antenna Hybrid Satellite-Terrestrial Relay Networks in the Presence of Interference," *IEEE Trans. Communications*, Vol. 63, No. 11, pp. 4390-4404, Nov. 2015.

[J89] L. You, X. Gao, A. Swindlehurst and W. Zhong, "Channel Acquisition for Massive MIMO-OFDM with Adjustable Phase Shift Pilots," *IEEE Trans. Signal Processing*, Vol. 64, No. 6, pp. 1461-1476, March 2016.

[J90] H. Shen, W. Xu, A. Swindlehurst and C. Zhao, "Transmitter Optimization for Per-Antenna Power Constrained Multi-Antenna Downlinks: An SLNR Maximization Methodology," *IEEE Trans. Signal Processing*, Vol. 64, No. 10, pp. 2712-2725, May 2016.

[J91] X. Yang and A. Swindlehurst, "Limited Rate Feedback in a MIMO Wiretap Channel with a Cooperative Jammer," *IEEE Trans. Signal Processing*, Vol. 64, No. 18, pp. 4695-4706, Sept. 2016.

[J92] B. He, X. Zhou and A. Swindlehurst, "On Secrecy Metrics for Physical Layer Security over Quasi-Static Fading Channels," *IEEE Trans. Wireless Comm.*, 2016 (to appear).

[J93] J. Chen, F. Jiang and A. Swindlehurst, "The Gaussian CEO Problem for Scalar Sources with Arbitrary Memory," *IEEE Trans. Information Theory*, 2016 (to appear).

Papers Currently in Review

[R1] Y. Li, C. Tao, G. Seco-Granados, A. Mezghani, A. Swindlehurst and L. Liu, "Channel Estimation and Performance Analysis of One-Bit Massive MIMO Systems," submitted *IEEE Trans. Signal Processing*, April 2016.

Book Chapters

[B1] A. van der Veen, E. Deprettere, and A. Swindlehurst, "SVD-Based Estimation of Low Rank System Parameters," in *Algorithms and Parallel VLSI Architectures, Volume A: Tutorials*, Chapter 9, pp. 203-228, Elsevier Science Publishers B.V., 1991.

[B2] A. Paulraj, B. Ottersten, R. Roy, A. Swindlehurst, G. Xu, and T. Kailath, "Subspace Methods for Direction of Arrival Estimation," in *Handbook of Statistics, Signal Processing and its Applications*, Chapter 16, pp. 693-740, C. R. Rao and N. K. Bose editors, Elsevier Science Publishers B. V., 1993.

[B3] A. Swindlehurst and M. Viberg, "Bayesian Approaches for Robust Array Signal Processing," in *Statistical Methods in Signal Processing and Control*, Chapter 15, pp. 399-430, T. Katayama and S. Sugimoto editors, Marcel Dekker, Inc., 1997.

[B4] G. Seco, A. Swindlehurst and D. Astély, "Exploiting Antenna Arrays for Synchronization," in *Signal Processing Advances in Wireless Communications*, Volume 2, Chapter 10, pp. 403-430, G. Giannakis, Y. Hua, and P. Stoica editors, Prentice Hall, Inc., 2000.

[B5] C. Peel, Q. Spencer, A. Swindlehurst, M. Haardt and B. Hochwald, "Linear and Dirty-Paper Techniques for the Multiuser MIMO Downlink," in *Space-Time Processing for MIMO Communications*, Chapter 6, pp. 209-244, A. Gershman and N. Sidiropoulos editors, John Wiley & Sons, Ltd., 2005.

[B6] Q. Spencer, J. Wallace, C. Peel, T. Svantesson, A. Swindlehurst, H. Lee and A. Gumalla, "Performance of Multi-User Spatial Multiplexing with Measured Channel Data," in *MIMO System Technology for Wireless Communications*, Chapter 7, George Tsoulos editor, CRC Press, Inc., 2006.

[B7] M. Jansson, B. Ottersten, M. Viberg and A. Swindlehurst, "Optimal Subspace Techniques for DOA Estimation," in *Space-Time Wireless Systems: From Array Processing to MIMO Communications*, Chapter 13, pp. 261-278, H. Bölcskei, D. Gesbert, C. Papadias and A. van der Veen, editors, Cambridge University Press, 2006.

[B8] A. Swindlehurst, B. Jeffs, G. Seco-Granados and J. Li, "Applications of Array Signal Processing," in *Academic Press Library in Signal Processing: Volume 2, Communications and Radar Signal Processing*, S. Theodoridis, editor, Elsevier B.V., 2013.

[B9] A. Mukherjee, A. Fakoorian, J. Huang and A. Swindlehurst, "MIMO Signal Processing Algorithms for Enhanced Physical-Layer Security," in *Physical Layer Security in Wireless Communications*, Chapter 6, X. Zhou, L. Song and Y. Zhang editors, CRC Press, 2013.

Peer-Reviewed Conference Publications

[C1] A.L. Swindlehurst and W.C. Stirling, "An Adaptive Empirical Bayes Decision-Directed Detector," In *Proc. 20th Asilomar Conference on Signals, Systems, and Computers*, pp. 292-296, Pacific Grove, CA, November, 1986.

[C2] A.L. Swindlehurst and T. Kailath, "Passive Direction-of-Arrival and Range Estimation for Near-Field Sources," In *Proc. 4th ASSP Spectral Estimation Workshop*, pp. 123-128, Minneapolis, MN, August, 1988.

[C3] A.L. Swindlehurst and T. Kailath, "Near-Field Source Parameter Estimation Using a Spatial Wigner Distribution Approach," In *Proc. SPIE Conference on Advanced Algorithms and Architectures for Signal Processing III*, Vol. 975, pp. 86-92, San Diego, CA, August, 1988.

[C4] R.H. Roy, B. Ottersten, A.L. Swindlehurst, and T. Kailath, "Multiple Invariance ESPRIT," In *22nd Asilomar Conference Signals, Systems, and Computers*, Vol. 2, pp. 583-587, Pacific Grove, CA, November, 1988.

[C5] A.L. Swindlehurst and T. Kailath, "Detection and Estimation Using the Third Moment Matrix," In *Proc. IEEE ICASSP*, Vol. 4, pp. 2325-2328, Glasgow, Scotland, May, 1989.

[C6] A.L. Swindlehurst, R.H. Roy, and T. Kailath, "Suboptimal Subspace-Fitting Methods for Multidimensional Signal Parameter Estimation," In *Proc. SPIE Conference on Advanced Algorithms and Architectures for Signal Processing IV*, Vol. 1152, pp. 197=203, San Diego, CA, August, 1989.

[C7] R.H. Roy, M. Goldburg, B. Ottersten, A. Swindlehurst, M. Viberg, T.Kailath, "ESPRIT and Uniform Linear Arrays," In *Proc. SPIE Conference on Advanced Algorithms and Architectures for Signal Processing IV*, Vol. 1152, pp. 370-381, San Diego, CA, August, 1989.

[C8] A. Swindlehurst and T. Kailath, "2-D Parameter Estimation Using Arrays with Multidimensional Invariance Structure," In *Proc. 23rd Asilomar Conference of Signals, Systems, and Computers*, Vol. 2, pp. 950-954, Pacific Grove, CA, November, 1989.

[C9] A. Swindlehurst, B. Ottersten, and T. Kailath, "An Analysis of MUSIC and Root-MUSIC in the Presence of Sensor Perturbations," In *Proc. 23rd Asilomar Conference Signals, Systems, and Computers*, Vol. 2, pp. 930-934, Pacific Grove, CA, November, 1989.

[C10] A. Swindlehurst and T. Kailath, "An Analysis of Subspace Fitting Algorithms in the Presence of Sensor Errors," In *Proc. IEEE ICASSP*, Vol. 5, pp. 2647-2650, Albuquerque, NM, April, 1990.

[C11] A. Swindlehurst, "Robust Algorithms for Direction-Finding in the Presence of Model Errors," In *Proc. 5th ASSP Spectral Estimation and Modeling Workshop*, pp. 362-366, Rochester, NY, October, 1990.

[C12] A. Swindlehurst, "Fast Updating of Maximum Likelihood Direction of Arrival Estimates," In *Proc. 25th Asilomar Conference Signals, Systems, and Computers*, Vol. 1, pp. 302-306, Pacific Grove, CA, November, 1991.

[C13] A. Swindlehurst, "Identifiability Issues for Rotationally Invariant Arrays," In *Proc. 25th Asilomar Conference Signals, Systems, and Computers*, Vol. 1, pp. 312-316, Pacific Grove, CA, November, 1991.

[C14] A. Swindlehurst, "Maximum Likelihood DOA Estimation and Detection Without Eigendecomposition," In *Proc. IEEE ICASSP*, Vol. 5, pp. 401-404, San Francisco, CA, March, 1992.

[C15] A. Swindlehurst, R. Roy, B. Ottersten, and T. Kailath, "System Identification via Weighted Subspace Fitting," in *Proc. American Control Conference*, pp. 2158-2163, Chicago, IL, June, 1992.

[C16] A. Swindlehurst and M. Viberg, "Efficient Subspace Fitting Algorithms for Diversely Polarized Arrays," In *Proc. IEEE ICASSP*, Vol. 4, pp. 324-327, Minneapolis, MN, April, 1993.

[C17] M. Viberg and A. Swindlehurst, "Analysis of the Combined Effects of Finite Data and Model Errors on Array Processing Performance," In *Proc. IEEE ICASSP*, Vol. 4, pp. 372-375, Minneapolis, MN, April, 1993.

[C18] J. Yang and A. Swindlehurst, "Signal Copy with Array Calibration Errors," In *Proc. 27th Asilomar Conference Signals, Systems, and Computers*, Vol. 2, pp. 1533-1537, Pacific Grove, CA, November, 1993.

[C19] J. Yang, S. Daas, and A. Swindlehurst, "Improved Signal Copy with Partially Known or Unknown Array Response," In *Proc. IEEE ICASSP*, Vol. 4, pp. 265-268, Adelaide, Australia, April, 1994.

[C20] M. Viberg and A. Swindlehurst, "A Bayesian Approach to Direction Finding with Parametric Array Uncertainty," In *Proc. IEEE ICASSP*, Vol. 4, pp. 85-88, Adelaide, Australia, April, 1994.

[C21] J. Yang, S. Daas, and A. Swindlehurst, "On the Copy of Communication Signals using Antenna Arrays," *Proc. 10th IFAC Symposium on System Identification and Parameter Estimation*, Copenhagen, Denmark, July, 1994.

[C22] J. Yang and A. Swindlehurst, "DF-Directed Multipath Equalization," In *Proc. 28th Asilomar Conference Signals, Systems, and Computers*, Vol. 2, pp. 1418-1422, Pacific Grove, CA, November, 1994.

[C23] A. Swindlehurst, "Optimal Direction Finding with Partially Calibrated Arrays," In *Proc. IEEE ICASSP*, Vol. 3, pp. 1880-1883, Detroit, MI, May, 1995.

[C24] J. Yang and A. Swindlehurst, "Maximum SINR Beamforming for Correlated Sources," In *Proc. IEEE ICASSP*, Vol. 3, pp. 1916-1919, Detroit, MI, May, 1995.

[C25] A. Swindlehurst, "Synchronization and Spatial Signature Estimation for Multiple Known Co-Channel Signals," In *Proc. 29th Asilomar Conference Signals, Systems, and Computers*, Vol. 1, pp. 398-402, Pacific Grove, CA, November, 1995.

[C26] J. Gunther and A. Swindlehurst, "Algorithms for Blind Equalization with Multiple Antennas Based on Frequency Domain Subspaces," In *Proc. IEEE ICASSP*, Vol. 5, pp. 2419-2422, Atlanta, GA, May, 1996.

[C27] A. Swindlehurst, "A Maximum a Posteriori Approach to Beamforming in the Presence of Calibration Errors," In *Proc. IEEE Statistical Signal and Array Processing Workshop*, pp. 82-85, Corfu, Greece, June, 1996.

[C28] J. Gunther and A. Swindlehurst, "Blind Sequential Symbol Estimation of Co-Channel Finite Alphabet Signals," In *Proc. 30th Asilomar Conference Signals, Systems, and Computers*, Vol. 2, pp. 823-827, Pacific Grove, CA, November, 1996.

[C29] Q. Spencer, B. Jeffs, M. Jensen, and A. Swindlehurst, "Experiments in Modeling the Space-Time Indoor Wireless Communication Channel," In *Proc. IEEE Workshop Signal Processing in Wireless Communications*, pp. 297-300, Paris, France, April, 1997.

[C30] A. Swindlehurst, M. Goris, and B. Ottersten, "Some Experiments with Array Data Collected in Actual Urban and Suburban Environments," In *Proc. IEEE Workshop Signal Processing in Wireless Communications*, pp. 301-304, Paris, France, April, 1997.

[C31] D. Asztély, B. Ottersten, and A. Swindlehurst, "A Generalized Array Manifold Model for Local Scattering in Wireless Communications," In *Proc. IEEE ICASSP*, Vol. 5, pp. 4021-4024, Munich, Germany, April, 1997.

[C32] D. Asztély, A. Swindlehurst, and B. Ottersten, "Auto-calibration for Signal Separation with Uniform Linear Arrays," In *Proc. IEEE DSP Workshop*, Vol. 1, pp. 403-406, Santorini, Greece, July, 1997.

[C33] J. Gunther and A. Swindlehurst, "Simultaneous Blind Equalization and Decoding of Multiple Coded Co-Channel Signals," In *Proc. 31st Asilomar Conference Signals, Systems, and Computers*, Vol. 1, pp. 188-192, Pacific Grove, CA, November, 1997.

[C34] A. Swindlehurst and P. Stoica, "Radar Signal Processing with Antenna Arrays via Maximum Likelihood," In *Proc. 31st Asilomar Conference Signals, Systems, and Computers*, Vol. 2, pp. 1219-1223, Pacific Grove, CA, November, 1997.

[C35] J. Gunther and A. Swindlehurst, "On the Use of Kernel Structure for Blind Equalization," In *Proc. IEEE ICASSP*, Vol. 6, pp. 3393-3396, Seattle, WA, May, 1998.

[C36] A. Jakobsson, A. Swindlehurst, and P. Stoica, "Resolution of Overlapping Doppler Shifted Echoes," In *Proc. IEEE ICASSP*, Vol. 4, pp. 2417-2420, Seattle, WA, May, 1998.

[C37] M. Jansson, A. Swindlehurst, and B. Ottersten, "Robust Weighted Subspace Fitting in the Presencetemp of Array Model Errors," In *Proc. IEEE ICASSP*, Vol. 4, pp. 1961-1964, Seattle, WA, May, 1998.

[C38] X. Zhuang and A. Swindlehurst, "Methods for Blind Equalization via Joint Diagonalization," In *Proc. IEEE DSP Workshop*, Bryce Canyon, UT, August, 1998.

[C39] A. Jakobsson and A. Swindlehurst, "A Time Domain Method for Joint Estimation of Time Delays, Doppler Shifts, and Spatial Signatures," In *Proc. IEEE Statistical Signal and Array Processing Workshop*, pp. 388-391, Portland, OR, September, 1998.

[C40] A. Jakobsson, A. Swindlehurst, D. Asztély, and C. Tidestav, "A Blind Frequency Domain Method for DS-CDMA Synchronization Using Antenna Arrays," In *Proc. 32nd Asilomar Conference Signals, Systems, and Computers*, Vol. 2, pp. 1848-1852, Pacific Grove, CA, November, 1998.

[C41] S. Ricks and A. Swindlehurst, "Detection Performance Degradation due to Miscalibrated Arrays in Airborne Radar," In *Proc. 32nd Asilomar Conference Signals, Systems, and Computers*, Vol. 2, pp. 1532-1536, Pacific Grove, CA, November, 1998.

[C42] A. Swindlehurst and J. Gunther "Direct Semi-blind Symbol Estimation for Multipath Channels," In *Proc. 32nd Asilomar Conference Signals, Systems, and Computers*, Vol. 2, pp. 1124-1128, Pacific Grove, CA, November, 1998.

[C43] X. Zhuang and A. Swindlehurst, "Fixed Window Constant Modulus Algorithms," In *Proc. IEEE ICASSP*, Vol. 5, pp. 2623-2626, Phoenix, AZ, March, 1999.

[C44] J. Gunther, H. Liu, and A. Swindlehurst "A New Approach for Symbol Frame Synchronization and Carrier Frequency Estimation in OFDM Communications," In *Proc. IEEE ICASSP*, Vol. 5, pp. 2725-2728, Phoenix, AZ, March, 1999.

[C45] X. Zhuang and A. Swindlehurst, "Fixed Window Constant Modulus Algorithms: Adaptive Implementations," In *Proc. IEEE Workshop Signal Processing Advances in Wireless Communications*, pp. 90-93, Annapolis, MD, May, 1999.

[C46] D. Astély, A. Jakobsson, and A. Swindlehurst, "Burst Synchronization on Unknown Frequency Selective Channels with Co-Channel Interference Using Antenna Arrays," In *Proc. IEEE Vehicular Technology Conference*, Vol. 3, pp. 2363-2367, Houston, TX, May, 1999.

[C47] A. Jakobsson, A. Swindlehurst, D. Astély, and C. Tidestav, "On Blind DS-CDMA Synchronization Using an Antenna Array," In *Proc. RadioVetenskap och Kommunikation 99*, Karlskrona, Sweden, June, 1999.

[C48] M. Jensen, Q. Spencer, A. Swindlehurst and B. Jeffs, "Measurement and Modeling of Temporal and Spatial Indoor Multipath Characteristics," in *Proc. IEEE Antennas and Propagation Society Int'l Symposium*, Vol. 1, pp. 388-391, Orlando, FL, July, 1999.

[C49] G. Seco, J. Fernández-Rubio, and A. Swindlehurst, "Code-Timing Synchronization in DS-CDMA Systems Using Space-Time Diversity," In *Proc. 5th Bayona Workshop on Emerging Technologies in Telecommunications – COST 254*, pp. 173-177, Bayona, Spain, September, 1999.

[C50] X. Zhuang and A. Swindlehurst, "A Space-Time Semi-Blind Equalizer Based on Constant Modulus and Decision Direction," In *Proc. 33rd Asilomar Conference Signals, Systems, and Computers*, Vol. 2, pp. 1017-1021, Pacific Grove, CA, October, 1999.

[C51] A. Swindlehurst and P. Parker, "Parametric Clutter Rejection for Space-Time Adaptive Processing," In *Proc. 8th Workshop on Adaptive Sensor Array Processing*, pp. 7-12, MIT Linoln Labs, Lexington, MA, March, 2000.

[C52] A. Swindlehurst, "Simultaneous Channel Estimation and Decoding for Diagonal Space-Time Codes," In *Proc. 1st IEEE Sensor Array and Multichannel Signal Processing Workshop*, pp. 173-177, Boston, MA, March, 2000.

[C53] G. Seco, A. Swindlehurst, and D. Astély, "A Reduced Complexity and Asymptotically Efficient Time-Delay Estimator," In *Proc. IEEE ICASSP*, Vol. 1, pp. 580-583, Istanbul, Turkey, June, 2000.

[C54] A. Swindlehurst, P. Stoica, and M. Jansson, "Application of MUSIC to Arrays with Multiple Invariances," In *Proc. IEEE ICASSP*, Vol. 5, pp. 3057-3060, Istanbul, Turkey, June, 2000.

[C55] X. Zhuang, Z. Ding, and A. Swindlehurst, "A Statistical Subspace Method for Blind Channel Identification in OFDM Communications," In *Proc. IEEE ICASSP*, Vol. 5, pp. 2493-2496, Istanbul, Turkey, June, 2000.

[C56] G. Seco, A. Swindlehurst, and J. Fernández-Rubio, "A Polynomial Rooting Approach for Synchronization in Multipath Channels Using Antenna Arrays," In *Proc. IEEE Statistical Signal and Array Processing Workshop*, pp. 668-672, Poconos, PA, August, 2000.

[C57] Q. Spencer and A. Swindlehurst, "Some Results on Channel Capacity when Using Multiple Antennas," In *Proc. IEEE Vehicular Technology Conference*, Vol. 2, pp. 681-688, Boston, MA, September, 2000.

[C58] D. Bliss, K. Forsythe, A. Hero, and A. Swindlehurst, "MIMO Environmental Capacity Sensitivity," In *Proc. 34th Asilomar Conference Signals, Systems, and Computers*, Vol. 1, pp. 764-768, Pacific Grove, CA, November, 2000.

[C59] P. Parker and A. Swindlehurst, "Parametric Filters for Non-Stationary Interference Mitigation in Airborne Radars," In *Proc. 9th Workshop on Adaptive Sensor Array Processing*, MIT Linoln Labs, Lexington, MA, March, 2001.

[C60] A. Swindlehurst, G. German, J. Wallace, and M. Jensen, "Experimental Measurements of Capacity for MIMO Indoor Wireless Channels," In *Proc. IEEE Workshop Signal Processing Advances in Wireless Communications*, pp. 30-33, Taipei, Taiwan, March, 2001.

[C61] P. Parker and A. Swindlehurst, "A Parametric Approach to Hot Clutter Cancellation," In *Proc. IEEE ICASSP*, Vol. 5, pp. 2909-2912, Salt Lake City, UT, May, 2001.

[C62] Q. Spencer and A. Swindlehurst, "On the Performance of Multicarrier CDMA using Multiple Transmitters," In *Proc. IEEE ICASSP*, Vol. 4, pp. 2397-2400, Salt Lake City, UT, May, 2001.

[C63] C. Peel and A. Swindlehurst, "Performance of Unitary Space-Time Modulation in a Continuously Changing Channel," In *Proc. IEEE ICASSP*, Vol. 4, pp. 2433-2436, Salt Lake City, UT, May, 2001.

[C64] G. German, Q. Spencer, A. Swindlehurst, and R. Valenzuela, "Wireless Indoor Channel Modeling: Statistical Agreement of Ray Tracing Simulations and Channel Sounding Measurements," In *Proc. IEEE ICASSP*, Vol. 4, pp. 2501-2504, Salt Lake City, UT, May, 2001.

[C65] C. Peel and A. Swindlehurst, "Performance of Unitary Space-Time Modulation in a Fading Channel," In *Proc. IEEE International Conf. on Communications*, Vol. 9, pp. 2805-2808, Helsinki, Finland, June, 2001.

[C66] J. Wallace, M. Jensen and A. Swindlehurst, "Measurement and Modeling of the Multiple-Input Multiple-Output Wireless Channel," In *Proc. International Conf. on Electromagnetics in Advanced Applications*, pp. 811-814, Torino, Italy, September, 2001.

[C67] A. Swindlehurst, "Closed-Form Blind and Semi-Blind Estimation of Linear Receivers for Space-Time Coding," In *Proc. IEEE International Conf. on Communications*, Vol. 1, pp. 652-657, New York, NY, April, 2002.

[C68] A. Swindlehurst, "Blind and Semi-Blind Equalization for Generalized Space-Time Precoding," In *Proc. IEEE ICASSP*, Vol. 3, pp. 2221-2224, Orlando, FL, May, 2002.

[C69] A. Swindlehurst, "Blind Separation of Space-Time Block Coded Signals via the Analytic Constant Modulus Algorithm," In *Proc. 2nd IEEE Workshop on Sensor Array and Multichannel Signal Processing*, pp. 457-451, Washington, DC, August, 2002.

[C70] A. Swindlehurst, "Iterative Maximum Likelihood Decoding of Generalized Space-Time Block Codes," In *Proc. 27th URSI General Assembly*, Paper 530, 4 pages, Maastricht, The Netherlands, August, 2002.

[C71] J. Wallace, M. Jensen, and A. Swindlehurst, "Measurement and Modeling of the MIMO Wireless Channel," In *Proc. 27th URSI General Assembly*, Paper 471, 4 pages, Maastricht, The Netherlands, August, 2002.

[C72] C. Peel and A. Swindlehurst, "Optimal Trained Space-Time Modulation Over a Rician Time-Varying Channel," In *Proc. 36th Asilomar Conference Signals, Systems, and Computers*, Vol. 2, pp. 1127-1131, Pacific Grove, CA, November, 2002.

[C73] C. Peel and A. Swindlehurst, "Probability of Error for Trained Unitary Space-Time Modulation Over a Gauss-Innovations Rician Channel," In *Proc. IEEE ICASSP*, Vol. 4, pp. 29-32, Hong Kong, April, 2003.

[C74] Q. Spencer, A. Swindlehurst, and M. Haardt, "Fast Power Minimization with QoS Constraints in Multi-User MIMO Downlinks," In *Proc. IEEE ICASSP*, Vol. 4, pp. 816-819, Hong Kong, April, 2003.

[C75] C. Peel and A. Swindlehurst, "Pairwise Probability of Error for Differential Space-Time Modulation Over a Time-Varying Rician Channel," In *Proc. IEEE International Conf. on Communications*, Vol. 4, pp. 2698-2702, Anchorage, AK, May, 2003.

[C76] C. Peel and A. Swindlehurst, "Capacity-Optimal Training for Space-Time Modulation Over a Time-Varying Channel," In *Proc. IEEE International Conf. on Communications*, Vol. 5, pp. 3036-3040, Anchorage, AK, May, 2003.

[C77] B. Farhang-Boroujeny, Q. Spencer, and A. Swindlehurst, "Layering Techniques for Space-Time Communications in Multi-User Networks," In *Proc. IEEE Vehicular Technology Conference*, Vol. 2, pp. 1339-1342, Orlando, FL, October, 2003.

[C78] M. Jensen and A. Swindlehurst, "MIMO Technology for Point-to-Point and Multi-User Wireless Communication," In *Proc. IEEE Topical Conf. on Wireless Communication Technology*, pp. 84-85, October, 2003.

[C79] C. Peel, B. Hochwald, and A. Swindlehurst, "Achieving Near-Capacity in Multi-Antenna Multi-User Systems," In *Proc. 41st Allerton Conference on Communication, Control, and Computing*, pp. 1466-1475, Monticello, IL, October, 2003.

[C80] T. Svantesson and A. Swindlehurst, "A Performance Bound for Prediction of a Multipath MIMO Channel," In *Proc. 37th Asilomar Conference Signals, Systems, and Computers*, Vol. 1, pp. 233-237, Pacific Grove, CA, November, 2003.

[C81] J. Russ, D. Casbeer and A. Swindlehurst, "STAP Detection Using Space-Time Autoregressive Filtering," In *Proc. IEEE Radar Conference*, pp. 541-545, Philadelphia, PA, April, 2004.

[C82] A. Swindlehurst, "A Semi-Blind Algebraic Constant Modulus Algorithm," In *Proc. IEEE ICASSP*, Vol. 4, pp. 445-448, Montreal, Canada, May, 2004.

[C83] Q. Spencer and A. Swindlehurst, "Channel Allocation in Multi-user MIMO Wireless Communications Systems," In *Proc. IEEE International Conf. on Communications*, Vol. 5, pp. 3035-3039, Paris, France, June, 2004.

[C84] C. Peel, Q. Spencer, A. Swindlehurst, and B. Hochwald, "Downlink Transmit Beamforming in Multi-User MIMO Systems," In *Proc. 3rd IEEE Workshop on Sensor Array and Multi-channel Signal Processing*, pp. 43-51, Stiges, Spain, July, 2004.

[C85] P. Zhan, D. Casbeer and A. Swindlehurst, "A Centralized Control Algorithm for Target Tracking with UAVs," In *Proc. 39th Asilomar Conference Signals, Systems, and Computers*, pp. 1148-1152, Pacific Grove, CA, November, 2005.

[C86] Z. Han, A. Swindlehurst and K. J. R. Liu, "Smart Deployment/Movement of Unmanned Air Vehicles to Improve Connectivity in MANETs," In *Proc. IEEE Wireless Communications and Networking Conference*, Vol. 1, pp. 252-257, Las Vegas, NV, April, 2006.

[C87] C. Peel, A. Swindlehurst and D. Dahlhaus, "Distance-Weighted Throughput for Multi-Antenna Wireless Networks with Multi-User Links," In *Proc. IEEE Vehicular Technology Conference*, Vol. 2, pp. 901-905, Melbourne, Australia, May, 2006.

[C88] D. Casbeer, P. Zhan and A. Swindlehurst, "A Non-Search Optimal Control Solution for a Team of MUAVs in a Reconnaissance Mission," In *Proc. IEEE ICASSP*, Vol. 4, pp. 1169-1172, Toulouse, France, May, 2006.

[C89] M. Nokleby, W. Stirling, and A. Swindlehurst, "Satisficing Learning Dynamics in the Stag Hunt," In *Proc. IEEE Mountain Workshop on Adaptive and Learning Systems*, pp. 219-224, Logan, UT, July, 2006.

[C90] M. Larsen and A. Swindlehurst, "Multiple-Pass Decision-Directed Channel Estimation for Highly Mobile MIMO Communications," In *Proc. 4th IEEE Workshop on Sensor Array and Multichannel Signal Processing*, pp. 219-223, Boston, MA, July, 2006.

[C91] P. Zhan, K. Yu and A. Swindlehurst, "Wireless Relay Communications using an Unmanned Aerial Vehicle," In *Proc. IEEE Workshop Signal Processing Advances in Wireless Communications*, pp. 1-5, Cannes, France, July, 2006.

[C92] D. Casbeer, A. Swindlehurst and R. Beard, "Connectivity in a UAV Multi-static Radar Network," In *Proc. AIAA Guidance, Navigation and Control Conference*, Paper AIAA 2006-6209, 8 pages, Keystone, CO, August, 2006.

[C93] C. Peel, A. Swindlehurst and W. Utschick, "Transport Capacity Regions for Wireless Networks with Multi-User Links," In *Proc. EUSIPCO*, Florence, Italy, September, 2006.

[C94] M. Larsen, T. Svantesson and A. Swindlehurst, "A Performance Bound for Interpolation of MIMO-OFDM Channels," In *Proc. 40th Asilomar Conference Signals, Systems, and Computers*, pp. 1801-1805, Pacific Grove, CA, November, 2006.

[C95] C. Shaw, C. Peel and A. Swindlehurst, "Medium Access Control for Multi-Antenna Networks using Multi-User Coding," In *Proc. 40th Asilomar Conference Signals, Systems, and Computers*, pp. 107-111, Pacific Grove, CA, November, 2006.

[C96] Y. Rong, Y. Hua and A. Swindlehurst, "Space-Time Power Schedule for Distributed MIMO Links Without Channel State Information at Transmitting Nodes," In *Proc. IEEE ICASSP*, Vol. 3, pp. 593-596, Honolulu, HI, April, 2007.

[C97] P. Zhan, R. Annavajjala and A. Swindlehurst, "Impact of User Mobility and Asymmetry on Multiuser Scheduler Performance," In *Proc. 41st Asilomar Conference Signals, Systems, and Computers*, pp. 1181-1185, Pacific Grove, CA, October, 2007.

[C98] M. Nokleby, A. Swindlehurst, Y. Rong and Y. Hua, "Cooperative Power Scheduling for Wireless MIMO Networks," In *Proc. IEEE GlobeCom*, pp. 2982-2986, Washington, DC, November, 2007.

[C99] F. Antreich, J. Nossek, G. Seco and A. Swindlehurst, "Time-Delay Estimators in a Spatially Structured Model Using Decoupled Estimators for Temporal and Spatial Parameters," In *Proc. International ITG Workshop on Smart Antennas*, pp. 16-20, Darmstadt, Germany, February, 2008.

[C100] P. Zhan, R. Annavajjala, A. Swindlehurst and T. Chauvin, "A Realistic Performance Analysis for Practical Channel-Aware Scheduling," In *Proc. IEEE ICASSP*, pp. 3165-3168, Las Vegas, NV, April, 2008.

[C101] F. Antreich, J. Nossek, G. Seco and A. Swindlehurst, "The Extended Invariance Principle Applied to Joint Time-Delay, Frequency and DOA Estimation," In *Proc. IEEE ICASSP*, pp. 2485-2488, Las Vegas, NV, April, 2008.

[C102] M. Larsen, A. Swindlehurst and T. Svantesson, "A Performance Bound for MIMO-OFDM Channel Estimation and Prediction," In *Proc. IEEE Workshop on Sensor Array and Multi-channel Signal Processing*, pp. 141-145, Darmstadt, Germany, July, 2008.

[C103] M. Nokleby and A. Swindlehurst, "Bargaining and Multi-user Detection in MIMO Interference Networks," In *Proc. IEEE Int'l Conf. on Computer Communications and Networks*, pp. 1-6, Virgin Islands, August, 2008.

[C104] D. Casbeer, R. Beard and A. Swindlehurst, "Discrete Double Integrator Consensus with Perturbations," In *Proc. IEEE Conf. on Decision and Control*, pp. 2264-2269, Cancun, Mexico, December, 2008.

[C105] F. Antreich, J. Nossek, G. Seco and A. Swindlehurst, "Time-Delay Estimation Applying the Extended Invariance Principle with a Polynomial Rooting Approach," In *Proc. International ITG Workshop on Smart Antennas*, Darmstadt, Germany, February, 2009.

[C106] A. Swindlehurst, "Fixed SINR Solutions for the MIMO Wiretap Channel," In *Proc. IEEE ICASSP*, pp. 2437-2440, Taipei, Taiwan, April, 2009.

[C107] M. Larsen and A. Swindlehurst, "A MIMO Channel Perturbation Analysis for Robust Bit-Loading," In *Proc. IEEE ICASSP*, pp. 2825-2828, Taipei, Taiwan, April, 2009.

[C108] A. Mukherjee and A. Swindlehurst, "Fixed-Rate Power Allocation Strategies for Enhanced Secrecy in MIMO Wiretap Channels," In *Proc. IEEE Worskhop Signal Processing Advances in Wireless Communications*, pp. 344-348, Perugia, Italy, June, 2009.

[C109] A. Mukherjee and A. Swindlehurst, "Utility of Beamforming Strategies for Secrecy in Multiuser MIMO Wiretap Channels," In *Proc. 47th Allerton Conf. on Communication, Control and Computing*, pp. 1134-1141, Monticello, IL, October, 2009.

[C110] T.-H. Kim, D. Tipper, P. Krishnamurthy and A. Swindlehurst, "Improving the Topological Resilience of Mobile Ad Hoc Networks," In *Proc. 7th IEEE International Workshop on the Design of Reliable Communication Networks*, pp. 191-197, Washington, DC, October, 2009.

[C111] A. Mukherjee and A. Swindlehurst, "User Selection in Multiuser MIMO Systems with Secrecy Considerations," In *Proc. 43rd Asilomar Conference Signals, Systems, and Computers*, pp. 1479-1482, Pacific Grove, CA, November, 2009.

[C112] J. Wang and A. Swindlehurst, "Cooperative Jamming in MIMO Ad-Hoc Networks," Performance," In *Proc. 43rd Asilomar Conference Signals, Systems, and Computers*, pp. 1719-1723, Pacific Grove, CA, November, 2009.

[C113] J. Chen and A. Swindlehurst, "Downlink Resource Allocation for Multi-user MIMO-OFDMA Systems: The Kalai-Smorodinsky Bargaining Approach," In *3rd IEEE International Workshop on Computational Advances in Multi-Sensor Adaptive Processing*, pp. 380-383, Aruba, Dutch Antilles, December, 2009.

[C114] M. Larsen and A. Swindlehurst, "MIMO SVD-Based Multiplexing with Imperfect Channel Knowledge," In *Proc. IEEE ICASSP*, pp. 3454-3457, Dallas, Texas, March, 2010.

[C115] A. Mukherjee and A. Swindlehurst, "Poisoned Feedback: The Impact of Malicious Users in Closed-Loop Multiuser MIMO Systems," In *Proc. IEEE ICASSP*, pp. 2558-2561, Dallas, Texas, March, 2010.

[C116] S.-C. Wu, Y. Yao and A. Swindlehurst, "Direct Interference Suppression in EEG/MEG Dipole Source Localization," In *Proc. IEEE ICASSP*, pp. 574-577, Dallas, Texas, March, 2010.

[C117] F. Jiang and A. Swindlehurst, "Scheduling for MIMO Networks with Rate-Constrained Connectivity Requirements," In *Proc. IEEE Vehicular Technology Conference*, pp. 1-5, Taipei, Taiwan, May, 2010.

[C118] A. Mukherjee and A. Swindlehurst, "Equilibrium Outcomes of Dynamic Games in MIMO Channels with Active Eavesdroppers," In *Proc. IEEE International Conf. on Communications*, pp. 1-5, Cape Town, South Africa, May, 2010.

[C119] A. Mukherjee and A. Swindlehurst, "Ensuring Secrecy in MIMO Wiretap Channels with Imperfect CSIT: A Beamforming Approach," In *Proc. IEEE International Conf. on Communications*, pp. 1-5, Cape Town, South Africa, May, 2010.

[C120] A. Mukherjee and A. Swindlehurst, "Securing Multi-Antenna Two-Way Relay Channels with Analog Network Coding Against Eavesdroppers," In *Proc. IEEE Worskhop Signal Processing Advances in Wireless Communications*, pp. 1-5, Marrakech, Morocco, June, 2010.

[C121] A. Mukherjee and A. Swindlehurst, "Optimal Strategies for Countering Dual-Threat Jamming/Eavesdropping-Capable Adversaries in MIMO Channels," In *Proc. IEEE Military Communications Conf. (MILCOM)*, pp. 1695-1700, San Jose, CA November, 2010.

[C122] A. Fakoorian and A. Swindlehurst, "MIMO Interference Channel with Confidential Messages: Game Theoretic Beamforming Designs," In *Proc. 44th Asilomar Conference Signals, Systems, and Computers*, pp. 2099-2103, Pacific Grove, CA, November, 2010.

[C123] S. O'Rourke and A. Swindlehurst, "Closed-Loop Tracking Using Multimodal RF/EO Sensors," In *Proc. 44th Asilomar Conference Signals, Systems, and Computers*, pp. 1662-1666, Pacific Grove, CA, November, 2010.

[C124] J. Huang and A. Swindlehurst, "Secure Communications via Cooperative Jamming in Two-hop Relay Systems," In *Proc. IEEE GlobeCom*, pp. 1-5, Miami, FL, December, 2010.

[C125] F. Jiang and A. Swindlehurst, "Dynamic UAV Relay Positioning for the Ground-to-Air Uplink," In *Proc. Int'l Workshop on Wireless Networking for Unmanned Aerial Vehicles*, pp. 1766-1770, Miami, FL, December, 2010.

[C126] J. Huang and A. Swindlehurst, "Cooperation Strategies for Secrecy in MIMO Relay Networks with Unknown Eavesdropper CSI," in *Proc. IEEE ICASSP*, pp. 3424-3427, Prague, Czech Republic, May, 2011.

[C127] J. Wang, A. Mukherjee and A. Swindlehurst, "Interference Self-Mitigating Beamforming for the K-User MIMO Interference Channel," in *Proc. IEEE ICASSP*, pp. 3352-3355, Prague, Czech Republic, May, 2011.

[C128] M. Larsen, G. Seco-Granados and A. Swindlehurst, "Pilot Optimization for Time-Delay and Channel Estimation in OFDM Systems," in *Proc. IEEE ICASSP*, pp. 3564-3567, Prague, Czech Republic, May, 2011.

[C129] A. Fakoorian and A. Swindlehurst, "Secrecy Capacity of MISO Gaussian Wiretap Channel with a Cooperative Jammer," in *Proc. IEEE Workshop on Signal Processing Advances in Wireless Communications*, pp. 416-420, San Francisco, CA, June, 2011.

[C130] X. Yang and A. Swindlehurst, "On the Use of Artificial Interference for Secrecy with Imperfect CSI," in *Proc. IEEE Workshop on Signal Processing Advances in Wireless Communications*, pp. 476-480, San Francisco, CA, June, 2011.

[C131] C. W. Lee, C. King, S. C. Wu, A. Swindlehurst and Z. Nenadic, "Signal Source Localization with Tetrodes: Experimental Verification," in *Proc. IEEE Conf. Engineering in Medicine and Biology Society*, pp. 67-70, Boston, MA, September, 2011.

[C132] S. C. Wu, A. Swindlehurst and Z. Nenadic, "Matched Subspace Detector Based Feature Extraction for Sorting of Multi-Sensor Action Potentials," in *Proc. IEEE Conf. Engineering in Medicine and Biology Society*, pp. 3704-3707, Boston, MA, September, 2011.

[C133] S. C. Wu and A. Swindlehurst, "EEG/MEG Source Localization Using Source Deflated Matching Pursuit," in *Proc. IEEE Conf. Engineering in Medicine and Biology Society*, pp. 6572-6575, Boston, MA, September, 2011.

[C134] Y. Yao and A. Swindlehurst, "Tracking Single Dynamic MEG Dipole Sources Using the Projected Extended Kalman Filter," in *Proc. IEEE Conf. Engineering in Medicine and Biology Society*, pp. 4365-4368, Boston, MA, September, 2011.

[C135] J. Huang and A. Swindlehurst, "QoS-Constrained Robust Beamforming in MISO Wiretap Channels with a Helper," In *Proc. 45th Asilomar Conference on Signals, Systems, and Computers*, pp. 188-192, Pacific Grove, CA, November, 2011.

[C136] A. Mukherjee and A. Swindlehurst, "A Full-Duplex Active Eavesdropper in MIMO Wiretap Channels: Construction and Countermeasures," In *Proc. 45th Asilomar Conference on Signals, Systems, and Computers*, pp. 265-269, Pacific Grove, CA, November, 2011.

[C137] A. Fakoorian and A. Swindlehurst, "Secure Space-Time Block Coding via Artificial Noise Alignment," In *Proc. 45th Asilomar Conference on Signals, Systems, and Computers*, pp. 651-655, Pacific Grove, CA, November, 2011.

[C138] A. Fakoorian and A. Swindlehurst, "Dirty Paper Coding Versus Linear GSVD-Based Precoding in MIMO Broadcast Channel with Confidential Messages," In *Proc. IEEE GlobeCom*, pp. 1-5, Houston, TX, December, 2011.

[C139] J. Huang and A. Swindlehurst, "Robust Secure Transmission in MISO Channels with Imperfect ECSI," In *Proc. IEEE GlobeCom*, pp. 1-5, Houston, TX, December, 2011.

[C140] A. Mukherjee and A. Swindlehurst, "Prescient Beamforming in Multi-User Interweave Cognitive Radio Networks," In *Proc. 4th IEEE International Workshop on Computational Advances in Multi-Sensor Adaptive Processing*, pp. 253-256, San Juan, Puerto Rico, December, 2011.

[C141] A. Mukherjee and A. Swindlehurst, "Detecting Passive Eavesdroppers in the MIMO Wiretap Channel," in *Proc. IEEE ICASSP*, pp. 2809-2812, Kyoto, Japan, March, 2012.

[C142] F. Jiang, J. Chen and A. Swindlehurst, "Phase-Only Analog Encoding for a Multi-Antenna Fusion Center," in *Proc. IEEE ICASSP*, pp. 2645-2648, Kyoto, Japan, March, 2012.

[C143] J. Chen and A. Swindlehurst, "On the Achievable Sum Rate of Multi-terminal Source Coding for a Correlated Gaussian Vector Source," in *Proc. IEEE ICASSP*, pp. 2665-2668, Kyoto, Japan, March, 2012.

[C144] J. Huang, A. Mukherjee and A. Swindlehurst, "Secrecy Analysis of Unauthenticated Amplify-and-Forward Relaying with Antenna Selection," in *Proc. IEEE ICASSP*, pp. 2481-2484, Kyoto, Japan, March, 2012.

[C145] S. O'Rourke and A. Swindlehurst, "Limited Field-of-View Multimodal Sensor Adaptation for Data Association," In *Proc. IEEE Workshop on Sensor Array and Multichannel Signal Processing*, pp. 241-244, Newark, NJ, June, 2012.

[C146] J. Huang, A. Mukherjee and A. Swindlehurst, "Outage Performance for Amplify-and-Forward Channels with an Unauthenticated Relay," In *Proc. IEEE International Conf. on Communications*, pp. 893-897, Ottawa, Canada, June, 2012.

[C147] A. Fakoorian and A. Swindlehurst, "Optimal Power Allocation for GSVD-Based Beamforming in the MIMO Gaussian Wiretap Channel," In *Proc. IEEE Int'l Symposium on Info. Theory*, pp. 2321-2325, Cambridge, MA, July, 2012.

[C148] S. C. Wu and A. Swindlehurst, "Performance Bounds for Dynamic Causal Modeling of Brain Connectivity," in *Proc. IEEE Conf. Engineering in Medicine and Biology Society*, pp. 1036-1039, San Diego, CA, August, 2012.

[C149] A. Fakoorian, J. Huang and A. Swindlehurst, "Rank Property of the MIMO Gaussian Wiretap Channel with an Average Power Constraint," In *Proc. 46th Asilomar Conference on Signals, Systems, and Computers*, pp. 421-425, Pacific Grove, CA, November, 2012.

[C150] J. Chen, F. Jiang and A. Swindlehurst, "The Gaussian CEO Problem for a Scalar Source with Memory: A Necessary Condition," In *Proc. 46th Asilomar Conference on Signals, Systems, and Computers*, pp. 1219-1223, Pacific Grove, CA, November, 2012.

[C151] F. Jiang, J. Chen and A. Swindlehurst, "Parameter Tracking via Optimal Distributed Beamforming in an Analog Sensor Network," In *Proc. 46th Asilomar Conference on Signals, Systems, and Computers*, pp. 1397-1401, Pacific Grove, CA, November, 2012.

[C152] R. Montalban, G. Seco-Granados and A. Swindlehurst, "Suboptimal Method for Pilot and Data Power Allocation in Combined Positioning and Communications OFDM Systems," In *Proc. 46th Asilomar Conference on Signals, Systems, and Computers*, pp. 1041-1045, Pacific Grove, CA, November, 2012.

[C153] M. Pei, A. Mukherjee, A. Swindlehurst and J. Wei, "Rank Minimization Designs for Underlay MIMO Cognitive Radio Networks with Completely Unknown Primary CSI," in *Proc. IEEE GlobeCom*, pp. 1150-1155, Anaheim, CA, Dec., 2012.

[C154] X. Yang and A. Swindlehurst, "Optimal Bit Allocation of Limited Rate Feedback for Cooperative Jamming," in *Proc. Signal & Information Processing Assoc. Annual Summit and Conference*, pp. 1-4, Los Angeles, CA, Dec., 2012.

[C155] R. Montalban, J. López-Salcedo, G. Seco-Granados and A. Swindlehurst, "Power Allocation Method Based on the Channel Statistics for Combined Positioning and Communications OFDM Systems," in *Proc. IEEE ICASSP*, Vancouver, BC, Canada, May, 2013.

[C156] F. Jiang, J. Chen and A. Swindlehurst, "Linearly Reconfigurable Kalman Filtering for a Vector Process," in *Proc. IEEE ICASSP*, Vancouver, BC, Canada, May, 2013.

[C157] M. Mañosas-Caballú, G. Seco-Granados and A. Swindlehurst, "Robust Beamforming via FIR Filtering for GNSS Multipath Mitigation," in *Proc. IEEE ICASSP*, Vancouver, BC, Canada, May, 2013.

[C158] J. Chen, F. Jiang, A. Swindlehurst and J. López-Salcedo, "Localization of Mobile Equipment in Radio Environments with No Line-of-Sight Path," in *Proc. IEEE ICASSP*, Vancouver, BC, Canada, May, 2013.

[C159] R. Montalban, J. López-Salcedo, G. Seco-Granados and A. Swindlehurst, "Power Allocation Approaches for Combined Positioning and Communications OFDM Systems," in *Proc. 14th IEEE Int'l Workshop on Signal Proc. Advances in Wireless Communications*, Darmstadt, Germany, June, 2013.

[C160] A. Fakoorian and A. Swindlehurst, "On the Optimality of Polar Codes for the Deterministic Wiretap Channel," In *Proc. 47th Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, CA, November, 2013.

[C161] J. Huang and A. Swindlehurst, "Joint Transmit Design and Node Selection for One-Way and Two-Way Untrusted Relay Channels," In *Proc. 47th Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, CA, November, 2013.

[C162] J. Huang and A. Swindlehurst, "Wireless Physical Layer Security Enhancement with Buffer-Aided Relaying," In *Proc. 47th Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, CA, November, 2013.

[C163] M. Newinger, L. Baltar, A. Swindlehurst and J. Nossek, "MISO Broadcasting FBMC System for Highly Frequency Selective Channels," In *Proc. 18th ITG Workshop on Smart Antennas*, Erlangen, Germany, March, 2014.

[C164] D. Zhu, A. Swindlehurst, A. Fakoorian, W. Xu and C. Zhao, "Device-to-Device Communications: The Physical Layer Security Advantage," In *Proc. IEEE ICASSP*, Florence, Italy, May, 2014.

[C165] F. Jiang, J. Chen and A. Swindlehurst, "Detection in Analog Sensor Networks with a Large Scale Antenna Fusion Center," In *Proc. IEEE Workshop on Sensor Array and Multichannel Signal Processing*, A Coruña, Spain, June, 2014.

[C166] D. Zhu, J. Wang, A. Swindlehurst and C. Zhao, "An Optimal Resource Reuse Strategy for QoS-Aware Device-to-Device Communications," In *Proc. IEEE/CIC Int'l Conf. on Communications in China*, Shanghai, China, October, 2014.

[C167] J. Chen and A. Swindlehurst, "Analysis of a Separable STAP Algorithm for Very Large Arrays," In *Proc. 48th Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, CA, November, 2014.

[C168] M. Khayambashi and A. Swindlehurst, "Filter Design for a Compressive Sensing Delay Estimation Framework," In *Proc. 48th Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, CA, November, 2014.

[C169] R. Ramlall, J. Chen and A. Swindlehurst, "Non-Line-of-Sight Mobile Station Positioning Algorithm using TOA, AOA and Doppler Shift," In *Proc. Ubiquitous Positioning Indoor Navigation and Location Based Service (UPINLBS)*, Corpus Christi, TX, November, 2014.

[C170] F. Wendler, F. Antreich, J. Nossek and A. Swindlehurst, "Dual-Polarization Time Delay Estimation for Multipath Mitigation," In *Proc. 19th ITG Workshop on Smart Antennas*, Ilmenau, Germany, March, 2015.

[C171] L. You, X. Gao, A. Swindlehurst and W. Zhong, "Adjustable Phase Shift Pilots for Sparse Massive MIMO-OFDM Channels," in *Proc. 16th IEEE Int'l Workshop on Signal Proc. Advances in Wireless Communications*, Stockholm, Sweden, June, 2015.

[C172] F. Wendler, F. Antreich, J. Nossek and A. Swindlehurst, "Stochastic-Deterministic Multipath Model for Time-Delay Estimation," In *Proc. 20th ITG Workshop on Smart Antennas*, Munich, Germany, March, 2016.

[C173] F. Steiner, A. Mezghani, A. Swindlehurst, J. Nossek and W. Utschick, "Turbo-Like Joint Data-and-Channel Estimation in Quantized Massive MIMO Systems," In *Proc. 20th ITG Workshop on Smart Antennas*, Munich, Germany, March, 2016.

[C174] J. Ouyang, M. Lin, W.-P. Zhu, D. Massicotte and A. Swindlehurst, "Energy Efficient Beamforming for Secure Communication in Cognitive Radio Networks," In *Proc. IEEE ICASSP*, Shanghai, China, March, 2016.

[C175] Y. Li, C. Tao, L. Liu, G. Seco-Granados and A. Swindlehurst, "Channel Estimation and Uplink Achievable Rates in One-Bit Massive MIMO Systems," In *Proc. IEEE Workshop on Sensor Array and Multichannel Signal Processing*, Rio de Janeiro, Brazil, July, 2016.

[C176] A. Saxena, I. Fijalkow and A. Swindlehurst, "On One-Bit Quantized ZF Precoding for the Multiuser Massive MIMO Downlink," In *Proc. IEEE Workshop on Sensor Array and Multichannel Signal Processing*, Rio de Janeiro, Brazil, July, 2016.

[C177] A. Saxena, I. Fijalkow, A. Mezghani and A. Swindlehurst, "Analysis of One-Bit Quantized ZF Precoding for Downlink Multiuser Massive MIMO," In *Proc. 50th Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, CA, November, 2016.

[C178] Y. Li, C. Tao, L. Liu, A. Mezghani and A. Swindlehurst, "How Much Training is Needed in One-Bit Massive MIMO Systems at Low SNR?" In *Proc. IEEE GlobeCom*, Washington, D.C., December, 2016.