

**VITA**  
March 23, 2007

**Name:** Michael David Zoltowski

**Personal:**

Date of Birth: August 12, 1960  
 Place of Birth: Philadelphia, PA  
 Citizenship: U.S.A.  
 Marital Status: Married  
 Wife's Name: Carla Bauer Zoltowski  
 Children's Names  
 and Birth dates: David M. Zoltowski - 10/22/92  
                           Alisa R. Zoltowski - 10/22/92  
                           Matthew C. Zoltowski - 10/22/92

**Education:**

<i>Degree</i>	<i>Date</i>	<i>School</i>
B.S.E.E.	June 1983	Drexel University
M.S.E.E.	June 1983	Drexel University
Ph.D.	August 1986	University of Pennsylvania

*Master's Thesis:*

“Synthesis and Analysis of an Offset Bifocal Dual Reflector Antenna”

*Dissertation:*

“High-Resolution Spatial Spectrum Estimation in a Coherent Signal Environment”

**Honorary Society Memberships:**

Eta Kappa Nu  
 Tau Beta Pi  
 Phi Kappa Phi  
 Phi Eta Sigma

**Honors and Awards:**

1. *First Honors Award for Senior with Highest Cumulative Average in Electrical Engineering*, Drexel University, 1983.
2. *Office of Naval Research Graduate Fellowship*, 1982-1986.
3. **IEEE Outstanding Branch Counselor/Advisor Award**, Purdue University - W. Lafayette, 1989-1990. Certificate, \$500 award, citation in *IEEE Potentials Magazine*.

4. **Ruth and Joel Spira Outstanding Teacher Award**, 1990-1991, presented annually to “an individual who has excelled in teaching and inspiring students in the School of Electrical Engineering.” Name on plaque and \$1000 award.
5. **IEEE Signal Processing Society’s 1991 Paper Award** for “A Procrustes Rotations Based Eigenanalysis of the ESPRIT Data Pencil,” in June 1989 issue of *IEEE Trans. on Signal Processing*. Certificate, \$500 award, & citation in *IEEE Signal Processing Magazine*.
6. **E-Systems Best Paper Award for 1995** for A. S. Gecan and M. D. Zoltowski, “Power Minimization Techniques for GPS Null Steering Antennas,” *Institute of Navigation (ION) Conference*, Palm Springs, CA, 13-15 Sept. 1995.
7. Co-Advisor , Javier Ramos’ Dissertation, Polytechnic University of Madrid, entitled “Novel Techniques for Processing Digital Arrays,” received **ERICSSON Award for Best PhD Dissertation in Area of Mobile Communications** (in Spain) for 1995 by Spanish Professional Association of Electrical Engineers, 29 Oct. 1996.
8. **Expert Summary on Array Processing** presented at IEEE ICASSP ’97 in Munich, Germany, on 24 April 1997. One of 8 researchers invited to present an *Expert Summary*.
9. **The Fred Eilersick MILCOM Award for Best Paper in the Unclassified Technical Program**, Recipient along with Der-Feng Tseng, at *IEEE Military Communications (MILCOM ’98) Conference* held in Bedford, MA 19-21 October 1998, for “Blind Multichannel Identification for High-Speed TDMA.” Plaque awarded by IEEE Communications Society.
10. **Board of Governors, IEEE Signal Processing Society, Member-at-Large**, society wide election, 1 January 1998 - 31 December 2000.
11. **Fellow of IEEE**, effective 1 January 1999 for “Contributions to the theory of antenna array signal processing and two-dimensional direction-of-arrival estimation”. Photo and Fellow citation in April 1999 issue of *IEEE Communications Magazine*.
12. **Best Paper Award at IEEE International Symposium on Spread Spectrum Techniques and Applications (ISSSTA 2000)**, co-recipient with T. Krauss, Parsippany, NJ, 6-8 Sept. 2000, for paper entitled “MMSE Equalization Under Conditions of Soft Hand-Off.”
13. **University Faculty Scholar**, Purdue University, \$50K award plus plaque. Two faculty members selected from engineering per year. 1 August 2000-31 July 2004.
14. **Leonard G. Abraham Prize Paper Award in the Field of Communications Systems, IEEE Communications Society**, co-recipient along with Tai-Ann Chen, Wen-Yi Kuo, Jim Grimm, & Michael P. Fitz, for ”A Space-Time Model for Frequency Nonselective Rayleigh Fading Channels with Applications to Space-Time Modems” in July 2000 *IEEE Journal on Selected Areas in Communications* (Vol. 18, No. 7, pp. 1175-1190). Awarded at IEEE Int’l Communications Conference (ICC) , Helsinki, Finland, 13 June 2001.  
<http://www.comsoc.org/socstr/awards/paperawards.html#Leonard G. Abraham Prize>
15. **2002 Eaton Design Award, Faculty Recipient**, Purdue University, 8 March 2002. Recognizes a recent alumnus who has made substantial design contributions in industry, while also recognizing the faculty member indicated by the alumnus as having the most impact on their design experience at Purdue.

16. **2002 Wilfred Hesselberth Award for Teaching Excellence**, Purdue University, 23 April 2002. Top Teaching Award for School of Electrical and Computer Engineering. Citation in *2001-2002 Teaching Awards, Schools of Engineering* brochure, plaque, \$2K award, and named engraved on plaque outside ECE Main Office.
17. **Distinguished Lecturer** for *2002 IEEE Sensor Array and Multichannel (SAM) Workshop* in Rosslyn, VA, on 4-6 August 2002. One of 11 researchers invited to present Distinguished Lecture. [http://ite.gmu.edu/sam2002/distinguished\\_lecturers.htm](http://ite.gmu.edu/sam2002/distinguished_lecturers.htm)
18. **Advisory Council for Dept. of Electrical & Computer Engineering at Drexel University**. August 2003-present. Appointed August 2003. Also, highlight article in Drexel University's (1) 2003 College of Engineering Brochure, (2) Spring 2003 Electrical and Computer Engineering (ECE) Newsletter, and (3) ECE Web Page's Alumni News Section.
19. **2003 Distinguished Lecturer for IEEE Signal Processing Society**. "The Society's Distinguished Lecturer Program provides means for chapters to have access to individuals who are well known educators and authors in the fields of signal processing, to lecture at Chapter meetings." <http://www.ieee.org/organizations/society/sp/dlinfo.html>
20. **2002 Technical Achievement Award of IEEE Signal Processing Society**. <http://www.ieee.org/organizations/society/sp/techachv.html> , "The Technical Achievement Award honors a person who, over a period of years, has made outstanding technical contributions to the theory and/or practice in technical areas within the scope of the Society, as demonstrated by publications, patents, or recognized impact on the field." The award was conferred at ICASSP 2003 in Hong Kong during 6-10 April 2003.
21. **Keynote Address: IEE 2004 International Conference on Waveform Diversity and Design**. Edinburgh, Scotland 8-10 Nov. 2004.
22. **Technical Program Co-Chairman for SAM 2006: IEEE 2006 Sensor Array and Multichannel Workshop**. 12-14 July 2006, Waltham, MA; [www.sam2006.org](http://www.sam2006.org)
23. **Chairman: Sensor Array and Multichannel Technical Committee of IEEE Signal Processing Society**. <http://www.engr.uconn.edu/willett/barney.html#SECTION1> Elected for two year term, 1 Jan. 2005 - 31 Dec. 2006.
24. **Distinguished Engineering Alumnus, Department of Electrical & Computer Engineering, Drexel University**. Ceremony held 30 June 2006. One selected per year.

#### Professional Experience:

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|-----------------------|--|
| June 1980 - Aug. 1980 | Engineering Intern, Honeywell, Process Control Div., Fort Washington, PA.                              |
| June 1982 - Aug. 1982 | Engineering Intern, Antenna Technology/Satellite Communications, RCA Astro-Electronics, Princeton, NJ. |
| June 1983 - Aug. 1983 |  |
| Aug. 1986 - July 1992 | Assistant Professor, School of Electrical Engineering, Purdue University.                              |
| Aug. 1992 - Jul 1997  | Associate Professor, School of Electrical and Computer Engineering, Purdue University.                 |

Aug. 1997 - present      Full Professor, School of Electrical and Computer Engineering, Purdue University.

### Consulting Activities:

1988-1991      General Electric Corporate Research and Development Center, Schenectady, NY, in the areas of surveillance systems and high resolution direction finding and beamforming.

2000-present      SAIC, Fairfax, VA, in the areas of reduced-rank adaptive filtering and arrival angle estimation for radar applications.

2001-2005      Zenith Electronics Corporation, Lincolnshire, IL, in the areas of equalization and carrier/timing recovery for 8-VSB Digital TV.

### Research Grants and Contracts Received:

1. Principal Investigator: National Science Foundation, Research Initiation Award, "Maximum Likelihood Based Angle-of-Arrival Estimation in a Diffuse Multipath Environment," co-PI's: none, Grant No. ECS-8707681, 1 Aug. 1987 to 31 Jan. 1990, \$60,000.
2. Principal Investigator: Purdue Research Foundation, David Ross XR Grant, "Maximum Likelihood Based Angle-of-Arrival Estimation in a Diffuse Multipath Environment," co-PI's: none, Award Number 6901301, 1 Jan. 1988 to 31 Dec. 1989, \$16,300.
3. Principal Investigator: General Electric Corporate Research and Development Center, "Simultaneous Sector Imaging Via High-Resolution Spectral Estimation For Very Large Arrays," co-PI's: none, Award Number 1724670, 14 August 1989 to 13 August 1990, \$17,092.
4. Principal Investigator: Purdue Research Foundation, David Ross XL Grant, "Computationally Efficient Methods of Advanced Spatial Spectral Estimation for Large Aperture Systems," co-PI's: none, 11 June 1990 to 3 August 3 1990, \$5,000.
5. Principal Investigator: Naval Ocean Systems Center, "Investigation of BeamSpace/Subarray Approaches to Source Localization With Very Large Sonar Arrays," co-PI's: none, Grant Number N66001-87-D-0136, 15 August 1990 to 30 June 1991, \$45,000.
6. Principal Investigator: General Electric Corporate Research and Development Center, "Simultaneous Sector Imaging Via High-Resolution Spectral Estimation For Very Large Arrays," co-PI's: none, (continuation) Award Number 1724670, 15 August 1990 to 12 August 1991, \$19,822.
7. Principal Investigator: General Electric Corporate Research and Development Center, "Target Detection in a Multipath Environment," co-PI's: none, Award Number 2295670, DSP No.ORO28, 30 December 1991 to 31 December 1992, \$20,000.
8. Principal Investigator: Air Force Office of Scientific Research (in conjunction with Wright-Patterson Air Force Base), "Real-Time Direction-of-Arrival Estimation of Wideband Signals with Multidimensional Arrays Via Signal Subspace Techniques," co-PI's: none, Grant Number F49620-92-J-0198, 1 April 1992 to 31 March 1993, \$49,961.

9. Principal Investigator: Air Force Office of Scientific Research (in conjunction with Wright-Patterson Air Force Base), "Real-Time Direction-of-Arrival Estimation of Wideband Signals with Multidimensional Arrays Via Signal Subspace Techniques," co-PI's: none, (continuation) Grant Number F49620-92-J-0198, 1 April 1993 to 31 March 1994, \$60,250.
10. Principal Investigator: National Science Foundation, "Closed-Form 2D Angle Estimation With Circular Arrays/Apertures for Mobile/Cellular Communications and Surveillance Radar," co-PI's: none, Grant Number MIP-9320890, 15 February 1994 to 31 July 1997, \$113,020.
11. International Travel Grant, Purdue Research Foundation, Spring 1994, \$1,324.
12. Principal Investigator: Air Force Office of Scientific Research (in conjunction with Wright-Patterson Air Force Base), "Real-Time Direction-of-Arrival Estimation of Wideband Signals with Multidimensional Arrays Via Signal Subspace Techniques," co-PI's: none, (continuation) Grant Number F49620-92-J-0198, 1 July 1994 to 15 May 1995, \$30,000.
13. Principal Investigator: National Science Foundation, Supplemental Award, "Closed-Form 2D Angle Estimation With Circular Arrays/Apertures for Mobile/Cellular Communications and Surveillance Radar," co-PI's: none, Grant Number MIP-9320890, 25 November 1994, FY '95, \$24,223.
14. Principal Investigator: E-Systems, "Adaptive Null Steering for GPS Signal Reception in the Presence of Co-Channel Interference," co-PI's: none, Grant Number H131114, 1 January 1995 to 31 December 1995, \$34,683.
15. Co-Principal Investigator: Army Research Office, Focused Research Initiative, "Wireless Distributed Multimedia Communications Networks for the Digital Battlefield," PI: J. Lehnert, co-PI's: Edwin Chong (Purdue), B. Hajek (Illinois), D. Sarwate (Illinois), U. Madhow (Illinois), W. Stark (Michigan), Magnavox, Hughes Network Systems, Grant Number DAAH04-95-1-0246. First year award for Zoltowski: 1 July 1995 to 30 June 1996, \$ 109,720.
16. Principal Investigator: Air Force Office of Scientific Research, AASERT Award, "Blind Adaptive Beamforming for Mobile Communications," co-PI's: none, Grant Number F49620-95-1-0367, 1 May 1995 to 30 April 1998, \$75,354.
17. Principal Investigator: Air Force Office of Scientific Research, "Dual-Use Smart Antenna Processing: Blind Adaptive Beamforming, GPS, and Vector Sensors," co-PI's: none, Grant Number F49620-95-1-0451, 15 June 1995 to 29 February 1998, \$162,821.
18. Principal Investigator: National Science Foundation, Supplemental Award, "Closed-Form 2D Angle Estimation With Circular Arrays/Apertures for Mobile/Cellular Communications and Surveillance Radar," co-PI's: none, Grant Number MIP-9320890, 15 February 1996, FY '96, \$25,350.
19. Principal Investigator: National Science Foundation, Supplemental Equipment Award, "Closed-Form 2D Angle Estimation With Circular Arrays/Apertures for Mobile/Cellular Communications and Surveillance Radar," co-PI's: none, Grant Number MIP-9320890, July 1996, \$3,420.
20. Co-Principal Investigator: Army Research Office, "FRI: Wireless Distributed Multimedia Communications Networks for the Digital Battlefield," co-PI's: listed in 15, Grant Number DAAH04-95-1-0246. Second-year option for Zoltowski: 1 July 1996-31 July 1997, \$51,970.

21. Principal Investigator: Air Force Office of Scientific Research, "Jam-Proof Area Deniable Propagation: Anti-Jam Protection for GPS Via Robust, Computationally Efficient Space-Time Adaptive Processing," co-PI's: none, Grant Number F49620-97-1-0275, 1 June 1997 to 31 December 1999, \$266,998.
22. Co-Principal Investigator: Army Research Office, "FRI: Wireless Distributed Multimedia Communications Networks for the Digital Battlefield," co-PI's: listed in 15, Grant Number DAAH04-95-1-0246. Third-year option for Zoltowski: 1 Jan. 1997 -31 Dec. 1997, \$61,675.
23. Principal Investigator: National Science Foundation, "Space-Time Processing for Digital Communications: Nonparametric Channel Estimation, Robust Interference Cancellation and Multichannel Equalizer Design Based on Linear Matrix Inequalities," co-PI's: Venkataramanan Balakrishnan, Grant Number MIP-9708309, 1 August 1997- 31 June 2000, \$277,000.
24. Co-Principal Investigator (Other Co-PIs: J.P. Allebach, M.R. Bell, C.A. Bouman, E. Coyle, E.K.P. Chong, E.J. Delp, P.C. Doerschuk, Saul B. Gelfand, J.V. Krogmeier, M.P. Harper, L.H. Jamieson, and N.B. Shroff), "Intel Equipment for Processing and Communication Intensive Tasks that Enable New Networked Video, Image, and Speech Applications," Intel Corporation, 7-1-97 to 6-30-00, \$598,000 (\$6M equipment grant from Intel to Purdue.)
25. Principal Investigator: Air Force Office of Scientific Research, co-PI's: J. V. Krogmeier and S. B. Gelfand, "Research Instrumentation for a Wireless Communications Laboratory," Grant Number F49620-98-1-0225, 3 March 1998 to 12 December 1998, \$78,000 (with additional \$26,000 matching funds from Purdue University.)
26. Co-Principal Investigator: TI DSP University Research Program, "Fixed Point DSP Implementation of a Bandwidth Efficient Wireless Modem," PI: J. Krogmeier, co-PI: Saul Gelfand, Grant Number 670 1285-5334. 1 Sept. 1999 to 31 August 2001, \$ 242,641.
27. Principal Investigator: Air Force Office of Scientific Research, "Space-Time Equalization for High-Speed Wireless Digital Communications based on Multipath-Incorporating Matched Filtering, Zero Forcing Equalization, and MMSE," co-PI's: none, Grant Number F49620-00-1-0127, 1 January 2000 to 31 November 2002, no-cost extension to 28 February 2003, \$264,785.
28. Principal Investigator: Zenith Electronics Corporation, "Reduced-Rank Decision Feedback Equalization for 8-VSB Digital TV," 1 Jan. 2001 to 31 December 2001, \$ 24,000.
29. Principal Investigator: National Science Foundation, " Reduced-Dimension Decision Feedback Equalizers for 4G High-Speed Wireless Digital Communications," Grant Number CCR-0118842, 1 September 2001- 31 August 2004, \$299,000.
30. Principal Investigator: Motorola University Partnerships in Research Program, "Frequency Domain Antenna Combining in Interference Limited Environments," \$ 24,350 for 1 Sept. 2001 to 31 August 2002.
31. Co-Principal Investigator: Purdue CERIAS Grant. PI: Bharat Bhargava. "Secure, Survivable, Jam Resistant Communications and Network Management." 1 July 2001 to 31 June 2002, \$ 75,000 (overhead free).
32. Co-Principal Investigator: National Science Foundation, " Instrumentation for Communications Research in Wireless Ad-Hoc Networking," PI: James Krogmeier, Charge no. 501

- 1285-0546, Grant Number EIA-0130599, 15 September 2001- 31 August 2004, \$198,977, with \$100K matching from Purdue.
33. Principal Investigator: Office of Naval Research, "Analysis of Statistical Performance Measures," co-PI's: none, Grant Number N00014-01-1-1066, PU Fund Number 531-1285-0135, 17 September 2001 to 30 September 2002, no-cost ext thru 31 Dec. 2002, \$51,000.
  34. Principal Investigator: National Science Foundation, "Research Experience for Undergraduates – REU Supplement," Grant Number CCR-0118842, \$5,000.
  35. Co-Principal Investigator: Purdue CERIAS Grant. PI: Bharat Bhargava. "Trusted Routing and Intruder Identification in Mobile Ad Hoc Networks," 15 August 2002 to 31 July 2003, \$ 50,000 (overhead free).
  36. Principal Investigator: Motorola University Partnerships in Research Program, (Continuing Grant), "Frequency Domain Antenna Combining in Interference Limited Environments," 1 Sept. 2002 to 31 July 2003, \$ 26,097.
  37. Principal Investigator: Office of Naval Research, "Advances in Reduced-Rank Adaptive Filtering," co-PI's: none, Grant Number N00014-03-01-0077, PU Fund Number 531-1285-0255, 1 October 2002 to 30 September 2003, \$51,000.
  38. Principal Investigator: Zenith Electronics Corporation, Research Gift, "Reduced-Rank Decision Feedback Equalization for 8-VSB Digital TV," Purdue Fund number 671-1285-3617, 1 Jan. 2002 to 31 December 2002, \$ 24,000.
  39. Principal Investigator: Texas Instruments, Research Gift, co-PI: James V. Krogmeier, "Cellular Communication Systems," Purdue Fund number 671-1285-4247, 1 Jan. 2003 to 31 December 2003, \$ 30,000.
  40. Co-Principal Investigator: Indiana 21st Century Fund, "Indiana Center for Wireless Communications and Networking;" Total Budget from Fund: \$1,777,829; Purdue Portion: \$837,883; Partners: Notre Dame U., Delphi Delco, Thomson, ITT, Safety Technologies; Purdue People: ECE M. Bell, S. B. Gelfand, J. V. Krogmeier, E. J. Delp, C. P. Rosenberg, N. B. Shroff, 9 January 2003 to 31 December 2005, (Purdue budget is \$837,883), Zoltowski portion \$100K.
  41. Principal Investigator: Air Force Office of Scientific Research, "Conjugate Gradient Based Reduced-Rank Signal Processing for Military Digital Communications," co-PI's: none, Grant Number F49620-03-1-0149, 1 January 2003 to 31 December 2003, \$92,533. Option 1 Increment: 1 January 2004 to 31 December 2004, \$96,380. Option 2 Increment: 1 January 2005 to 31 December 2005, \$97,402. Total: \$289,315.
  42. Principal Investigator: Office of Naval Research, "Signal-Dependent Reduced-Rank Multi-beam Array Processing and Novel BeamSpace Concepts for Wideband ABF," co-PI's: none, Grant Number N00014-04-1-0083, PU Fund Number 531-1285-0255, 17 October 2003 to 30 September 2006, \$288,608.
  43. Principal Investigator: Texas Instruments, Research Gift, co-PI: James V. Krogmeier, "MIMO Wireless Communications," Purdue Fund number 671-1285-4247, October 2004, \$30,000.
  44. Principal Investigator: Air Force Office of Scientific Research, MURI: Multi-University Research Initiative. " WAVEFORM DIVERSITY FOR FULL SPECTRAL DOMINANCE,"

Purdue Charge No. 531 1285-0677, AFOSR Grant No. FA9550-05-1-0443, 7/1/2005 to 7/31/2010, Zoltowski portion is \$114,000 per year for each of five years. MURI Team includes University of Illinois at Chicago, Arizona State University, Princeton University, and University of Maryland. Total for Zoltowski alone: \$570,000.

45. Principal Investigator: National Science Foundation, “ WAVEFORM DIVERSITY FOR WIRELESS COMMUNICATIONS WITH JOINT TRANSCEIVER MULTIPATH EXPLOITATION AND INTERFERENCE AVOIDANCE,” Purdue Charge No. 501 1285-1634 (Major), 8/1/2005 to 7/31/2008, Zoltowski portion is \$169,053. Overall grant includes sub-contract to the University of Minneapolis for Co-PI Professor Georgios Giannakis, \$ 221,818.
46. Co-Principal Investigator with David Love: Spectral Systems Incorporated, “ RELIABLE WIRELESS COMMUNICATION NETWORKS WITH HIGH MOBILITY,” Purdue Charge No. 670 1285-7396 (Major), 8/15/2005 to 12/31/2005, \$60,000.
47. Principal Investigator: Air Force Office of Scientific Research, “Space-Time for MIMO Multicasting and Full-Rate, Full-Diversity Codes with Partial CSI,” co-PI’s: none, Grant Number F49620-06-1-0xxx, 1 January 2006 to 31 December 2006, \$64,121. Option 1 Increment: 1 January 2007 to 31 December 2007, \$66,967. Option 2 Increment: 1 January 2008 to 31 December 2008, \$69,777. Total: \$200,865.
48. Co-Principal Investigator: DARPA, “ WAVEFORMS FOR ACTIVE SENSING: ADAPTIVE WAVEFORM DESIGN FOR DETECTING LOW-ANGLE GRAZING TARGETS,” Purdue Charge No. 531 1285-0790, AFOSR Grant 1/15/2006 to 7/14/2007, Zoltowski portion is \$132,019 for Phase I. Team includes University of Illinois at Chicago, Arizona State University, Princeton University, and University of Maryland.
49. Principal Investigator: Texas Instruments, Research Gift, co-PI: David J. Love, “MIMO Techniques for OFDM Systems,” Purdue Fund number 671-1285-5027, 18 April 2006, \$30,000.

### **Professional Society and Government Agency Activities:**

Organization: IEEE (Institute of Electrical and Electronics Engineers)

Activity: Student Member, 1979-1986

Member, 1986-1995

Senior Member, elected August 1995

Fellow, effective 1 Jan. 1999

2003 Distinguished Lecturer, Signal Processing Society

Organization: IEEE Signal Processing Society

Activity: Committee Memberships:

Awards Board,

First Term: 1 January 2003 - 31 December 2005.

Signal Processing Communications (SPC) Technical Committee,

First Term: 1 January 1999 - 31 December 2001.

Second Term: 1 January 2002 - 31 December 2004.



Sensor Array and Multichannel (SAM) Technical Committee,  
Chair: 1 January 2005 - 31 December 2006.

Vice-Chair Term: 1 January 2003 - 31 December 2004.

First Term: 1 January 2002 - 31 December 2004.

Board of Governors, Member-at-Large, elected November 1997,  
for 1 January 1998 - 31 December 2000.

Secretary of IEEE Signal Processing Society, elected 16 May 1998  
by Board of Governors, 1 January 1999 - 31 December 2001.

Secretary is member of both Executive Committee and Board of  
Governors of IEEE Signal Processing Society.

Statistical Signal and Array Processing (SSAP) Technical Committee,  
elected May 1995 for three year term. Duties include coordinating  
the review of papers for annual conference ICASSP, paper award  
nominations, organization of special workshops.

Education Committee, April 1996- 31 December 2000,  
Duties include selection of distinguished lecturers,  
organization of special ICASSP sessions on DSP education.

Co-Chair, Technical Program Committee, Signal Processing  
for Communications Symposium, Globecom 2004, Dallas, TX  
29 Nov. - 3 Dec. 2004

Technical Program Committee, Eighth IEEE Signal Processing Work-  
shop on Statistical Signal and Array Processing, 24-26 June 1996.

Technical Program Committee, Ninth IEEE Signal Processing Work-  
shop on Statistical Signal and Array Processing, September 1998.

Technical Program Chair, Tenth IEEE Signal Processing Work-  
shop on Statistical Signal and Array Processing, June 2000.

Statistical Signal and Array Processing (SSAP) Technical Committee,  
elected March 1998 for a second three year term starting May 1998.  
See previous listing for duties.

Organizing Committee, Workshop on "Adaptive Systems for Signal  
Processing," Lake Louise, Alberta, Canada, 2-4 October 2000.

Technical Program Committee, Sixth International Symposium on  
Spread Spectrum Theory and Application, Parsippany, NY, 6-8 Sept. 2000.

Technical Program Committee, Third IEEE Signal Processing for  
Advanced Wireless Communications, Taoyuan, Taiwan, 20-23 March 2001.

Technical Program CoChair, Globecom 2004: IEEE Global Communications Conference, Dallas, TX, December 2004.

Technical Program Committee, ICC 2005: IEEE International Conference on Communications, Seoul, Korea, 16-20 May 2005.

Technical Program Committee, SPAWC 2005: IEEE Signal Processing for Advanced Wireless Communications, New York City, NY, 5-8 June 2005.

Technical Program Chair, SAM 2006: IEEE Sensor Array and Multichannel Processing Workshop, Waltham, MA, 1-3 August 2006.

Activity: Editorships:

**Guest Editor**, EURASIP Journal on Applied Signal Processing, “Improved CDMA Detection Techniques for Future Wireless Systems.” *Special Issue*. 2004.

Guest Editor, IEEE Signal Processing Magazine, “Knowledge Based Systems for Adaptive Radar Detection, Tracking and Classification.” *Special Issue*. 2004.

Area Editor, IEEE Signal Processing Magazine, in charge of all feature articles, appointed May 2002 for three year term.

Associate Editor, IEEE Transactions on Signal Processing, appointed October 1994 for two year term.

Associate Editor, IEEE Communications Letters, appointed January 1997 for two year term.

Activity: Sessions Chaired:

27th Asilomar IEEE Conf. on Signals, Systems, & Computers, 2 Nov. 1993. Title: “Detection and Estimation”

29th Asilomar IEEE Conf. on Signals, Systems, & Computers, 1 Nov. 1995. Organized and chaired Special Session on “Smart Antenna Arrays for Wireless Communications.”

1996 IEEE International Conference on Acoustics, Speech, and Signal Processing, 9 May 1996. Title: “Adaptive Beamforming”

1997 Space Technology and Applications International Forum. Organized session on “Connecting to the Infosphere: Communications Technology for the Future Warfighter,” 26-30 Jan. 1997.

1997 IEEE International Conference on Acoustics, Speech, and

Signal Processing, 24 April 1997. Title: "Array Processing III: Wireless Communications."

1998 IEEE International Conference on Acoustics, Speech, and Signal Processing, 13 May 1998. Title: "Array Processing III: Adaptive Beamforming and Applications."

Ninth IEEE Signal Processing Workshop on Statistical Signal and Array Processing, September 1998. Title: "Space-Time Adaptive Processing."

32nd Asilomar IEEE Conf. on Signals, Systems, & Computers, 1 Nov. 1998. Invited to organize and chair Special Session on "Adaptive Signal Processing for Wireless Communications."

1998 IEEE Midwest Symposium on Circuits and Systems, 11 August 1998. Title: "Systems for Communications Applications," South Bend, Indiana.

1999 IEEE International Conference on Acoustics, Speech, and Signal Processing, 18 March 1999. Title: "Multi-User CDMA."

2001 IEEE International Conference on Acoustics, Speech, and Signal Processing, 9 March 2001. Title: "Space-Time Processing & Coding."

35th Asilomar IEEE Conf. on Signals, Systems, & Computers, 1 Nov. 2001. Chaired Special Session on "CDMA Communications Systems."

2002 IEEE International Conference on Acoustics, Speech, and Signal Processing, 16 May 2002. Title: "CDMA I."

36th Asilomar IEEE Conf. on Signals, Systems, & Computers, 4 Nov. 2003. Chaired Special Session on "Antenna Arrays and MIMO Systems."

2002 IEEE International Conference on Acoustics, Speech, and Signal Processing, 16 May 2002. Title: "CDMA I."

Organization: Central Indiana Section of IEEE

Activity: Student Branch Counselor, Purdue Student Branch of IEEE, 1988-1992. Organized Student Professional Awareness Conference (S-PAC) held at Purdue on 25 Jan. 1989.

Activity: Chairperson, Signal Processing Chapter of Central Indiana Section of IEEE, 1993-2001.

Organization: National Science Foundation

Activity: National Young Investigator (NYI) Award Panel, MIPS Division, CISE Directorate, Circuits and Signal Processing Program, Washington, DC, 2-3 May 1994.

Activity: Chair, NSF Array Signal Processing Workshop, 27-28 April 1995. Appointed by Circuits and Signal Processing Program Manager to organize and chair two-day workshop, draft Executive Summary and compile Proceedings that is an officially distributed NSF document and on the World Wide Web at <http://www.nsf.gov/mips/CSPhome.html>.

Activity: Future of Signal Processing Panel, convened by NSF Circuits and Signal Processing Program Manager, Durango, CO, 1-4 Aug. 1996.

Organization: National Science Foundation

Activity: Professional Opportunities for Women in Research and Education (POWRE) Award Proposal Review Panel, CISE Directorate, MIPS, Signal Processing Systems Program, Arlington, VA, 12 August 1997.

Activity: Panel Member, Towards Tetherless T3 Communications Workshop, 18-20 November 1998. Proceedings is an officially distributed NSF document on the Web at <http://www.cudenver.edu/public/engineer/T3-Workshop/T3Report-12-98.html>.

Organization: National Science Foundation

Activity: Wireless Information Technology and Networks Proposal Review Panel, CISE Directorate, CCR, Signal Processing Systems Program, Arlington, VA, 21-22 June 1999.

Organization: National Science Foundation

Activity: Research Infrastructure Proposal Review Panel, CISE Directorate, EIA, Experimental and Integrative Activities, Arlington, VA, 17 April 2000.

Organization: National Science Foundation

Activity: Large/Medium Information Technology Research (ITR) Panel Review, CISE Directorate, Communications and Computing Research (CCR), Los Angeles, CA, 1-2 February 2001.

Organization: National Science Foundation

Activity: Signal Processing Systems (SPS) Regular Panel Review, CISE Directorate, Communications and Computing Research (CCR), Davis, CA, 21-22 February 2002.

Organization: National Science Foundation

Activity: Small Information Technology Research (ITR)

Panel Review, CISE Directorate, Communications and Computing Research (CCR),  
Arlington, VA, 5-6 June 2002.

Organization: Society of Photographic and Instrumentation Engineers (SPIE)

Activity: Conference Co-Chair, Conference on

Digital Wireless Communications, AEROSENSE: Aerospace/Defense Sensing  
Simulation and Controls, Orlando, FL, 5-9 April 1999

Activity: Conference Co-Chair, Conference on

Digital Wireless Communications II, AEROSENSE: Aerospace/Defense Sensing  
Simulation and Controls, Orlando, FL, 27-28 April 2000

Activity: Conference Co-Chair, Conference on

Digital Wireless Communications III, AEROSENSE: Aerospace/Defense Sensing  
Simulation and Controls, Orlando, FL, 17-18 April 2001.

Activity: Conference Co-Chair, Conference on

Digital Wireless Communications IV, AEROSENSE: Aerospace/Defense Sensing  
Simulation and Controls, Orlando, FL, 1-1 April 2002.

Organization: American Society for Engineering Education

Activity: ONR Graduate Fellowship Review Panel, 1987, 1988, 1989, 1992.

Organization: Optical Society of America

Activity: Technical Program Committee, Topical Meeting on Signal

Recovery and Synthesis III, Cape Cod, MA, 14-16 June 1989.

**Ph. D. Thesis Supervision Completed:**

<i>Name</i>	<i>Date</i>	<i>Thesis Title</i>
Ta-Sung Lee	December 1989	“Beamspace Domain ML Based Low-Angle Radar Tracking With an Array of Antennas”
D. Stavrinides	May 1990	“Computationally Efficient Estimation of Azimuth and Elevation Angles of Multiple Sources With Planar Sensor Arrays”
D. Sherman	May 1993	“Novel Techniques for Detection and Estimation of Three-Wave Coupling With Application to Human Brain Waves”
C. P. Mathews	December 1993	“Signal Subspace Techniques Source Localization With Circular Sensor Arrays”
G. M. Kautz	May 1994	“Efficient Beamspace Eigen- Based Direction of Arrival Estimation Schemes”
J. Ramos	December 1995	“Novel Techniques for Processing Digital Arrays,” Polytechnic University of Madrid, co-advised with Dr. Mateo Burgos. <i>Awarded Best PhD Dissertation in Electrical Engineering in all of Spain by the Spanish Professional Association of Engineers, 1995-1996.</i>
K. T. Wong	December 1996	“Novel Techniques of Polarization Diversity & Extended Aperture Spatial Diversity for Sensor Array Direction Finding in Radar, Sonar, & Wireless Communications.”
T. A. Thomas	December 1997	“Space-Time Processing for Interference Cancellation and Equalization in Narrowband Digital Communications”
Tai-Ann Chen	August 1998	“Space-Time Characteristics of Frequency Non-selective Rayleigh Fading Channels with Applications to Modeling, System Design, and Demodulation”
Yung-Fang Chen	August 1998	“Space-Time Adaptive Processing for DS-CDMA Communication Systems”
Der-Feng Tseng	December 1998	“Blind Channel Identification and Space-Time Equalization for Narrow/Wideband Digital Communications Based on Parametric Modeling of the Channel Impulse Response”
Timothy Settle	December 1998	“Multi-Channel Equalization Using Linear Matrix Inequality Optimization”
Anand Kannan	May 1999	“Co-Channel Signal Separation under Imperfect Timing and Carrier Synchronization”

**Ph. D. Thesis Supervision Completed: (continued)**

<i>Name</i>	<i>Date</i>	<i>Thesis Title</i>
Thomas Hong Li	December 1999	“Blind and Semi-Blind Channel Identification for Wideband CDMA Communications”
Thomas P. Krauss	August 2000	“Topics in Signal Processing for Multi-User, Multi-Channel Digital Communications”
Wilbur Myrick	August 2000	“Low Complexity Anti-Jam Processing for GPS via Multistage Nested Wiener Filter”
Samina Chowdhury	December 2001	“Adaptive Reduced-Rank Linear Equalization for the Forward Link in Wideband DS-CDMA”
James Zhang	December 2002	“Variable Aperture Coding (VAC): A Bandwidth Efficient Modulation Scheme”
Serdar Ozen	December 2002	“Topics on Channel Estimation and Equalization for Sparse Channels with Applications to Digital TV Systems”
Mark B. Breinholt	August 2003	“Space-Time Alignment for Asynchronous Interference Suppression in MIMO OFDM Cellular Communications and Symbol Period Estimation for 8-VSB Digital TV”
William J. Hillery	May 2004	“Advanced Equalization of Digital TV Signals Using the Conjugate Gradient Algorithm”
Terry Charbonneau	May 2005	“Scan Synchronous Directional Antennas for Time Division Multiple Access in Multi-Hop Ad-Hoc Wireless Networks”
Perry K. Falk	May 2005	“Airborne Reception of CDMA Communications”
Ernesto Santos	December 2005	“Advanced Low-Rank Beamforming”
Hyejung Jung	December 2005	“Asynchronous Multi-User OFDM with Antenna Diversity”
Peilu Ding	December 2005	“Open-Loop and Closed-Loop Transmit Diversity Designs for Multiple Antenna Wireless Systems”

**M.S. Thesis Supervision Completed:**

<i>Name</i>	<i>Date</i>	<i>Thesis Title</i>
Louis Litwin	May 1999	“Blended CMA: Smooth Adaptive Transfer from CMA to Decision-Directed LMS”
Vinek Bhagat	December 2003	“MMSE Equalization for Wideband DS-CDMA Forward Link Employing Space-Time Block Coding with Frequency Selective Multipath”
Yifan Liang	May 2004	“Spatial Spectrum Analysis with Low Sample Support via Adaptive Beamforming”

**M.S. and Ph. D. Thesis Students Currently Being Supervised:**

Jianqi Wang	Ph.D.
Scott McGregor	Ph.D.
Songnan Xi	Ph.D.
Chad Lau	Ph.D.

**Courses Developed:**

EE 695D Array Signal Processing & Adaptive Filter Theory  
 EE 638 Digital Signal Processing I

**School Committee Activities:**

Committee: Communications and Signal Processing Area  
 Activity: Member, 1986-present  
 Activity: Seminar Series Coordinator, 1993-1997  
 Activity: Chairperson, 1994-1996  
 Activity: Area Review, Graduate Committee presentation on 15 April 1996

Committee: Purdue Electrical Engineering Industrial Institute  
 Activity: Faculty Liaison Member for Motorola, 1986-present  
 Activity: Technical Chairperson, PEEII Workshop on Communications and Signal Processing: "From Personal Wireless to Monitoring Planet Earth," 7-8 April 1994  
 Activity: Organized and Chaired Session on "Wireless Communications"  
 Presented: "Space-time Equalization for High-Speed Wireless Communications" 25-26 February 1999. Also, student paper "Multi-user Blind Identification Using a Linear Parameterization of the Channel Matrix and Second-Order Statistics" by Thomas P. Krauss  
 Activity: Organized and Chaired Session on "Wireless Communications"  
 Presented: "Space-time Processing for Wireless Communications." ECE Industrial Affiliates Workshop, 8 March 2002.

Committee: Curriculum Committee  
 Activity: Member, 1988-1992  
 Activity: Lab Tours Coordinator, 1992-1994

Committee: Social Committee  
 Activity: Member, 1987-1989

Committee: Graduate Admissions Committee  
 Activity: Member, 1998-1999

Committee: Graduate Committee  
 Activity: Member, 1999-2001

**Engineering-Wide Committee Activities:**

Committee: Academic Personnel Grievance Committee  
 Activity: Member, 1988-1990  
 Activity: Steering Committee, 1994-1996

Committee: Committee for Faculty Relations



Activity: Chair, 2002-2003 Academic Year  
 Activity: Elected Member, 2000-2002  
 Activity: Elected Member, 1997-1999

#### **University-Wide Committee Activities:**

Committee: Minorities Advisory Committee  
 Activity: Member, 1997-2001  
 Select applications for Graduate Opportunities Fellowships.

Committee: University Faculty Senate  
 Activity: ECE Representative, 2004-2007.

#### **Research Book Contributions and Books Published:**

1. M. D. Zoltowski, "Chapter V: Beamspace ML Bearing Estimation for Phased Array Radar," **Adaptive Radar Detection and Estimation**, edited by S. Haykin and A. O. Steinhardt, John Wiley & Sons, New York, NY, ISBN 0-471-54468-X, 1992, pp. 237-332.
2. C. P. Mathews and M. D. Zoltowski, "Closed-Form 2D Angle Estimation With Circular Arrays/Apertures Via Phase Mode Excitation and ESPRIT," **Advances in Spectrum Analysis and Array Processing, Vol. III**, edited by S. Haykin, Prentice-Hall, Englewood Cliffs, NJ, ISBN 0-13-061540-4, 1995, pp. 171-218.
3. M. Haardt, M. D. Zoltowski, and C. P. Mathews, "ESPRIT and Closed-Form 2D Angle Estimation with Planar Arrays," **Digital Signal Processing Handbook**, edited by V. Madisetti and D. Williams, Section XII-63, pp. 63-1 to 63-16, CRC Press, Boca Raton, FL, ISBN 0-8493-8572-5, 1998.
4. W. L. Myrick and M. D. Zoltowski, "Reduced-Rank Interference Suppression and Equalization for GPS and Downlink CDMA," **Applications of Space-Time Adaptive Processing**, edited by Richard Klemm, Chapter 24, pp. 857-880, IEE Press, London, UK, ISBN 0-85296-924-4, 2004.

### Serial Journal Refereed Articles:

1. F. Haber and M. D. Zoltowski, "Spatial Spectrum Estimation in a Coherent Signal Environment Using an Array in Motion," *IEEE Trans. Antennas & Propagation, Special Issue on Adaptive Processing Antenna Systems*, vol. AP-34, no. 3, March 1986, pp. 301-310.
2. M. D. Zoltowski and F. Haber, "A Vector Space Approach to Direction Finding in a Coherent Multipath Environment," *IEEE Trans. Antennas & Propagation*, vol. AP-34, no. 9, Sept. 1986, pp. 1069-1079.
3. M. D. Zoltowski and F. Haber, "A Multiply-Constrained Minimum Variance Approach to Multiple Source Parameter Estimation," *IEEE Trans. Acoustics, Speech, and Signal Processing*, vol. ASSP-35, no. 9, Sept. 1987, pp. 1358-1360.
4. M. D. Zoltowski, "Solving the Generalized Eigenvalue Problem with Singular Forms," *Proceedings of the IEEE*, vol. 75, no. 11, Nov. 1987, pp. 1546-1548.
5. M. D. Zoltowski, "On the Performance Analysis of the Optimum Beamformer in the Presence of Correlated Interference," *IEEE Trans. Acoustics, Speech, and Signal Processing*, vol. ASSP-36, no. 6, June 1988, pp. 945-947.
6. M. D. Zoltowski and D. Stavrinides, "Sensor Array Signal Processing via a Procrustes Rotations Based Eigenanalysis of the ESPRIT Data Pencil," *IEEE Trans. Acoustics, Speech, and Signal Processing*, vol. ASSP-37, no. 6, June 1989, pp. 832-861 (winner of 1991 Paper Award conferred by IEEE Signal Processing Society).
7. M. D. Zoltowski and T. Lee, "Maximum Likelihood Based Sensor Array Signal Processing in the Beamspace Domain for Low-Angle Radar Tracking," *IEEE Trans. on Signal Processing*, vol. 39, no. 3, March 1991, pp. 656-671.
8. M. D. Zoltowski and T. Lee, "Beamspace ML Bearing Estimation Incorporating Low-Angle Geometry," *IEEE Trans. Aerospace and Electronic Systems*, vol. 27, no. 3, May 1991, pp. 441-458.
9. S. D. Silverstein and M. D. Zoltowski, "A Fundamental Algorithm for Power Estimates of Closely-Spaced Spectral Sources in High Noise Backgrounds," *IEEE Trans. on Circuits and Systems*, vol. CAS-38, no. 5, May 1991, pp. 562-564.
10. S. D. Silverstein and M. D. Zoltowski, "The Mathematical Basis for Element and Fourier Beam Space MUSIC and Root-MUSIC Algorithms," *Digital Signal Processing, Academic Press*, vol. 1, no. 3, July 1991, pp. 161-175.
11. M. D. Zoltowski and T. Lee, "Interference Cancellation Matrix Beamforming for 3-D Beamspace ML/MUSIC Bearing Estimation," *IEEE Trans. on Signal Processing*, vol. 39, no. 8, Aug. 1991, pp. 1858-1876.
12. M. D. Zoltowski and T. Lee, "Bisector Angle Estimation in a Nonsymmetric Multipath Radar Scenario," *IEE-F Proceedings on Radar and Signal Processing*, vol. 138, no. 6, Dec. 1991, pp. 559-570.
13. M. D. Zoltowski, "Synthesis of Sum and Difference Patterns Possessing Common Nulls for Monopulse Bearing Estimation with Line Arrays," *IEEE Transactions on Antennas and Propagation*, vol. 40, no. 1, Jan. 1992, pp. 25-37.

14. M. D. Zoltowski, G. M. Kautz, and S. D. Silverstein, "Beamspace Root-MUSIC," *IEEE Trans. on Signal Processing*, vol. 41, no. 1, Jan. 1993, pp. 344-364.
15. M. D. Zoltowski, S. D. Silverstein, and C. P. Mathews, "Beamspace Root-MUSIC for Minimum Redundancy Linear Arrays," *IEEE Trans. on Signal Processing*, July 1993, pp. 2502-2507.
16. D. L. Sherman and M. D. Zoltowski, "Matrix-Based Higher Order Spectral Analysis for Three Wave Coupling Processes," *IEEE Trans. on Signal Processing*, vol. 42, no. 2, Feb. 1994, pp. 332-348.
17. M. D. Zoltowski, J. V. Krogmeier, and G. M. Kautz, "Novel Multirate Processing of Beamspace Noise Eigenvectors," *IEEE Signal Processing Letters*, vol. 1, no. 5, May 1994, pp. 83-87.
18. C. P. Mathews and M. D. Zoltowski, "Eigenstructure Techniques for 2-D Angle Estimation with Uniform Circular Arrays," *IEEE Trans. on Signal Processing*, vol. 42, no. 9, Sept. 1994, pp. 2395-2407.
19. C. P. Mathews and M. D. Zoltowski, "Performance Analysis of the UCA-ESPRIT Algorithm for Circular Ring Arrays," *IEEE Trans. on Signal Processing*, vol. 42, no. 9, Sept. 1994, pp. 2535-2539.
20. M. D. Zoltowski and C. P. Mathews, "Real-Time Frequency and 2-D Angle Estimation With Sub-Nyquist Spatio-Temporal Sampling," *IEEE Trans. on Signal Processing*, vol. 42, no. 10, Oct. 1994, pp. 2781-2794.
21. G. M. Kautz and M. D. Zoltowski, "Performance Analysis of MUSIC Employing Conjugate Symmetric Beamformers," *IEEE Trans. on Signal Processing*, vol. 43, no. 3, March 1995, pp. 737-748.
22. M. D. Zoltowski, M. Haardt, and C. P. Mathews, "Closed-Form 2D Angle Estimation with Rectangular Arrays in Element Space or Beamspace Via Unitary ESPRIT," *IEEE Trans. on Signal Processing*, February 1996, pp. 316-328.
23. C. P. Mathews, M. Haardt, and M. D. Zoltowski, "Performance Analysis of 2D Unitary ESPRIT for Closed-Form 2D Angle Estimation with Rectangular Arrays," *IEEE Signal Processing Letters*, April 1996, pp. 124-126.
24. M. D. Zoltowski, J. P. Allebach, and C. A. Bouman, "Digital Signal Processing With Applications: A New and Successful Approach to Undergraduate DSP Education," *IEEE Trans. on Education, Special Issue on Undergraduate DSP Education*, May 1996, pp. 120-126.
25. G. M. Kautz and M. D. Zoltowski, "Beamspace DOA Estimation Featuring Multirate Eigenvector Processing," *IEEE Trans. on Signal Processing*, vol. 44, no. 7, July 1996, pp. 1765-1778.
26. J. Gansman, M. D. Zoltowski, and J. V. Krogmeier, "Multidimensional Multirate DOA Estimation in Beamspace," *IEEE Trans. on Signal Processing*, vol. 44, no. 11, Nov. 1996, pp. 2780-2792.
27. H. Liu and M. D. Zoltowski, "Blind Equalization in Antenna Array CDMA Systems," *IEEE Trans. on Signal Processing, Special Issue on Signal Processing for Advanced Digital Communications*, vol. 45, no. 1, Jan. 1997, pp. 161-172.

28. K. T. Wong and M. D. Zoltowski, "Closed-Form Underwater Acoustic Direction Finding with Arbitrarily Spaced Vector-Hydrophones at Unknown Locations," *IEEE Journal of Oceanic Engineering*, vol. 22, no. 4, July 1997, pp. 566-575.
29. J. Ramos, M. D. Zoltowski, and Hui Liu, "A Low Complexity Space-Time Processor for DS-CDMA Communications," *IEEE Signal Processing Letters*, September 1997, pp. 262-265.
30. K. T. Wong and M. D. Zoltowski, "Uni-Vector-Sensor ESPRIT for Multi-Source Azimuth-Elevation-Polarization Estimation," *IEEE Trans. on Antennas and Propagation*, vo. 45, no. 10, Oct. 1997, pp. 1467-1474.
31. K. T. Wong and M. D. Zoltowski, "Closed-Form Underwater Acoustic Direction-Finding with Arbitrarily Spaced Vector Hydrophones at Unknown Locations," *IEEE Journal of Oceanic Engineering*, vol. 22, no. 4, Oct. 1997, pp. 649-658.
32. K. T. Wong and M. D. Zoltowski, "Extended-Aperture Underwater Acoustic Multisource Azimuth/Elevation Direction-Finding Using Uniformly But Sparsely-Spaced Vector Hydrophones," *IEEE Journal of Oceanic Engineering*, vol. 22, no. 4, Oct. 1997, pp. 659-672.
33. C. Chatterjee, and V. Roychowdhury, J. Ramos, and M. D. Zoltowski, "Self-Organizing and Adaptive Algorithms for Generalized Eigen-Decomposition," *IEEE Trans. on Neural Networks*, vol. 8, no. 6, November 1997, pp. 1518-1530.
34. K. T. Wong and M. D. Zoltowski, "ESPRIT-Based Direction Finding Using A Sparse Rectangular Array with Dual-Size Spatial Invariances," *IEEE Transactions on Aerospace and Electronic Systems*, October 1998, pp. 1320-1336.
35. T. F. Wong, T. M. Lok, J. S. Lehnert, and M. D. Zoltowski, "A Unified Linear Receiver for Direct-Sequence Spread-Spectrum Multiple Access Systems With Antenna Arrays and Blind Adaptation," *IEEE Trans. on Information Theory*, vol. 44, no. 2, March 1998, pp. 659-676.
36. J. Ramos, C. P. Mathews, and M. D. Zoltowski, "Closed-Form 2D Angle Estimation Algorithms for Filled Circular Arrays with Arbitrary Sampling Lattices," *IEEE Trans. on Signal Processing*, vol. 47, no. 1, Jan. 1999, pp. 213-217.
37. John Shynk and Michael D. Zoltowski, "Blind Adaptive Beamforming for Cellular Communications," **Highlights of Signal Processing for Communications**, *IEEE Signal Processing Magazine*, March 1999, pp. 27-31.
38. K. T. Wong and M. D. Zoltowski, "Root-MUSIC Based Azimuth-Elevation Angle-of-Arrival Estimation for Uniformly-Spaced but Arbitrarily Oriented Velocity Hydrophones," *IEEE Transactions on Signal Processing*, vol. 47, no. 12, December 1999, pp. 1350-1360.
39. J. Ramos, M. D. Zoltowski, and Hui Liu, "Low-Complexity Space-Time Processor for DS-CDMA Communications," *IEEE Trans. on Signal Processing*, vol. 48, no. 1, January 2000, pp. 39-52.
40. K. T. Wong and M. D. Zoltowski, "Self-Initiating MUSIC-Based Direction Finding in Underwater Acoustic Particle Velocity-Field BeamSpace," *IEEE Journal of Oceanic Engineering*, vol. 25, no. 2, pp. 262-273, April 2000.

41. Yung-Fang Chen, M. D. Zoltowski, J. Ramos, C. Chatterjee, and V. Roychowdhury, "Reduced Dimension Blind Space-Time RAKE Receivers for DS-CDMA Communication Systems," *IEEE Trans. on Signal Processing*, vol. 48, no. 6, June 2000, pp. 1521-1536.
42. Yung-Fang Chen and M. D. Zoltowski, "Blind RLS Based Space-Time Adaptive 2D RAKE Receivers for DS-CDMA Communication Systems," *IEEE Trans. on Signal Processing*, vol. 48, no. 7, July 2000, pp. 2145-2149.
43. Tai-Ann Chen, M. P. Fitz, Wen-Yi Kuo, M. D. Zoltowski, and James Grimm, "A Space-Time Model for Frequency Nonselective Rayleigh Fading Channels with Applications to Space-Time Modems," *IEEE journal on Selected Areas in Communications (J-SAC) Wireless Communication Series*, vol. 18, no. 7, July 2000, pp. 1175-1190.
44. M. D. Zoltowski and K. T. Wong, "ESPRIT-Based 2D Direction Finding with a Sparse Uniform Array of Electromagnetic Vector-Sensors," *IEEE Transactions on Signal Processing*, vol. 48, no. 8, August 2000, pp. 2205-2210.
45. K. T. Wong and M. D. Zoltowski, "Closed-Form Eigenstructure-Based Direction Finding Using Arbitrary but Identical Subarrays on a Sparse Uniform Rectangular Array Grid," *IEEE Transactions on Signal Processing*, vol. 48, no. 8, August 2000, pp. 2195-2204.
46. K. T. Wong and M. D. Zoltowski, "Closed-Form Direction Finding & Polarization Estimation with Arbitrarily-Spaced Electromagnetic Vector Sensors at Unknown Locations," *IEEE Transactions on Antennas and Propagation*, vol. 48, no. 5, May 2000, pp. 671-681.
47. T. Krauss and M. D. Zoltowski, "Multiuser Second-Order Statistics Based Blind Channel Identification for Using a Linear Parameterization of the Channel Matrix," *IEEE Trans. on Signal Processing*, vol. 48, no. 9, September 2000, pp. 2473-2486.
48. K. T. Wong and M. D. Zoltowski, "Self-Initiating MUSIC Based Direction Finding in Polarized Beamspace," *IEEE Transactions on Antennas and Propagation*, vol. 48, no. 8, August 2000, pp. 1235-1245.
49. Murat Torlak, Hui Liu, and M. D. Zoltowski, "OFDM Blind Carrier Offset Estimation: ESPRIT," *IEEE Transactions on Communications*, vol. 48, Sept. 2000, pp. 1459-1461.
50. Anand Kannan, T. Krauss, and M. D. Zoltowski, "Separation of Co-channel Signals Under Imperfect Timing and Carrier Synchronization," *IEEE Transactions on Vehicular Technology*, vol. 50, Jan. 2001, pp. 79-96.
51. P. Tichavsky, K. T. Wong and M. D. Zoltowski, "Near-Field/Far-Field Azimuth and Elevation Angle Estimation Using a Single Vector Sensor," *IEEE Transactions on Signal Processing*, vol. 49, no. 11, November 2001, pp. 2498-2510.
52. T. Krauss, W. Hillery, and M. D. Zoltowski, "Downlink Specific Linear Equalization for Frequency Selective CDMA Cellular Systems," **Journal of VLSI Signal Processing, Special Issue on Signal Processing for Wireless Communications: Algorithms, Performance, and Architecture**, Vol. 30, Nos. 1-3, January-March 2002, pp. 143-162.
53. S. Chowdhury, M. D. Zoltowski, and J. S. Goldstein, "Reduced-Rank Chip-Level MMSE Equalization for the 3G CDMA Forward Link with Code-Multiplexed Pilot," **EURASIP Journal on Applied Signal Processing Special Issue on 3G Wireless Communications and Beyond**, Vo. 2002, No. 8, August 2002, pp. 771-786.

54. Zhengyuan (Daniel) Xu, P. Liu, and M. D. Zoltowski, "Diversity Assisted Channel Estimation and Multiuser Detection for Downlink CDMA with Long Spreading Codes," **IEEE Transactions on Signal Processing**, vol. 52, no. 1, Jan. 2004, pp. 190-201.
55. Tai-Ann Chen, M. P. Fitz, S. Li, and M. D. Zoltowski, "Two Dimensional Space-Time Pilot Symbol Assisted Demodulation for Frequency Nonselective Rayleigh Fading Channels," *IEEE Transactions on Communications*, vol. 52, no. 6, June 2004, pp. 953-963.
56. Wong, K.T.; Linshan Li; Zoltowski, M.D.; "Root-MUSIC-based direction-finding and polarization estimation using diversely polarized possibly colocated antennas," *Antennas and Wireless Propagation Letters*, Volume: 3 , Issue: 8 , 2004, Pages: 129 - 132.
57. M. D. Zoltowski, "Positive reinforcement and constructive criticism - from the editor," *IEEE Signal Processing Magazine*, volume: 21 , Issue: 6 , Nov. 2004 Pages:2 - 2.
58. M. B. Breinholt, H. Jung, and M. D. Zoltowski, "Space-Time Alignment for Asynchronous Interference Suppression in MIMO OFDM Cellular Communications," **Special Issue on MIMO Communications**, *Wiley's Journal of Wireless Communications and Mobile Computing*, pp. 755-771, vol. 4, 2004.
59. X.Cai, G. B. Giannakis, and M. D. Zoltowski, "Space-Time Spreading and Block Coding for Correlated Fading Channels in the Presence of Interference," *IEEE Trans. on Communications*, vol. 53, no. 3, March 2005, pp. 515-525.
60. P. Ding, D. J. Love, J. Wang, and M. D. Zoltowski, "Low Complexity Adaptive Design for Full Diversity, Full Rate Space-Time Codes," *IEEE Trans. on Signal Processing*, Volume 54, Issue 8, Aug. 2006 Page(s):3180 - 3189 2006.
61. C. Pladdy, S. Ozen, M. Fimoff, P. Ding, and M. D. Zoltowski, "Semi-Blind BLUE Channel Estimation with Applications to Digital Television," *IEEE Trans. on Vehicular Technology*, 2006. Volume 55, Issue 6, Nov. 2006 Page(s):1812 - 1823.
62. E. Santos, M. D. Zoltowski, and M. Rangaswamy, "Indirect Dominant Mode Rejection: A Solution to Low Sample Support Beamforming," accepted and scheduled for publication in the *IEEE Trans. on Signal Processing*, 2006.
63. P. Ding, D. J. Love, and M. D. Zoltowski, "Multiple Antenna Broadcast Channels with Shape Feedback and Limited Feedback," accepted and scheduled for publication in the *IEEE Trans. on Signal Processing*, 2006.

#### Conference Proceedings and Presentations:

1. M. D. Zoltowski, P. Kalata, and C. E. Profera, "An Offset Bifocal Dual Reflector Antenna," *1983 IEEE Int'l. Antennas & Propagation Symposium Digest*, May 1983, vol. 1, pp. 318-321.
2. M. D. Zoltowski and F. Haber, "Superresolution of Symmetric Multipath," Ben Franklin Symposium Digest, *IEEE Conference on Advances in Antenna & Microwave Tech.*, Philadelphia, PA, May 1985, vol. 2, pp. 7-9.
3. M. D. Zoltowski and F. Haber, "A Vector Space Approach to Direction Finding in a Coherent Multipath Environment," *IEEE Int'l. Antennas & Propagation Symposium Digest*, Philadelphia, PA, June 1986, pp. 599-602.

4. M. D. Zoltowski and F. Haber, "A Modified ML Approach to Multiple Source Parameter Estimation," (invited paper) *SPIE Int'l. Symposium, Advanced Algorithms and Architectures for Signal Processing I*, August 1986, SPIE Vol. 696, pp. 123-131.
5. M. D. Zoltowski, "High-Resolution Bearing Estimation in the Presence of Multipath Propagation and Interference," (invited poster - no paper) *Office of Naval Research Symposium on Forty Years of Excellence*, 21-22 October 1986.
6. M. D. Zoltowski, "Solving the Semi-Definite Generalized Eigenvalue Problem with Application to ESPRIT," *Proceedings of 1987 IEEE Int'l Conference on Acoustics, Speech, and Signal Processing*, April 1987, vol. 4, pp. 2316-2319.
7. M. D. Zoltowski, "Maximum Likelihood Based Angle-of-Arrival Estimation in a Diffuse Multipath Environment," *1987 IEEE Int'l Antennas & Propagation Symposium Digest*, June 1987, vol. 1, pp. 32-35.
8. M. D. Zoltowski, "Signal Processing Applications of the Method of Total Least Squares," (invited paper) *Conference Record of the 21st Asilomar IEEE Conference on Signals, Systems, and Computers*, November 1987, pp. 290-296.
9. M. D. Zoltowski, "Novel Techniques for the Estimation of Array Signal Parameters Based on Matrix Pencils, Subspace Rotations, and Total Least Squares," *Proceedings of 1988 IEEE Int'l Conference on Acoustics, Speech, and Signal Processing*, April 1988, vol. 5, pp. 2861-2864.
10. M. D. Zoltowski, "High Resolution Sensor Array Signal Processing in the BeamSpace Domain: Novel Techniques Based on the Poor Resolution of Fourier Beamforming," (invited paper) *Fourth ASSP Workshop on Spectrum Estimation and Modeling*, 3-5 August 1988, pp. 350-355.
11. M. D. Zoltowski, "Generalized Minimum Norm and Constrained Total Least Squares with Applications to Array Signal Processing," (invited paper) *SPIE Int'l. Symposium, Advanced Algorithms and Architectures for Signal Processing III*, August 1988, SPIE Vol. 975, pp. 78-85.
12. D. Sherman and M. D. Zoltowski, "Eigenanalysis Based Bispectrum Estimation," *Proceedings 24th Annual Allerton Conference on Communications, Systems, and Computing*, 28-30 September, 1988, pp. 249-250.
13. D. Stavrinides and M. D. Zoltowski, "Multiple Source Localization Via Redundancy Exploitation With Geometrically Redundant Planar Sensor Arrays," *Signal Recovery and Synthesis III Technical Digest*, vol. 15, Cape Cod, MA, 14-16 June 1989, pp. 85-88.
14. T.-S. Lee and M. D. Zoltowski, "BeamSpace Domain ML Based Low Angle Radar Tracking with an Array of Antennas," *1989 IEEE Int'l Antennas & Propagation Symposium Digest*, vol. II, 26-30 June 1989, pp. 663-666.
15. D. Sherman and M. D. Zoltowski, "Application of Eigenstructure Based Bispectrum Estimation: EEG Wave Coupling in Cognitive Tasks" *Proceedings of the First Workshop on Higher-Order Spectral Analysis*, Vail, CO, 28-30 June, 1989, pp. 135-138.
16. M. D. Zoltowski, "Signal Processing Applications of Constrained Total Least Squares with Multiple Homogeneous Constraints," (invited paper) *1988 SIAM Annual Meeting, Mini-Symposium on Signal Processing Algorithms*, 17-21 July 1989, p. A25.

17. M. D. Zoltowski and T.S. Lee, "Bearing Estimation in Beamspace Employing Frequency Diversity," (invited paper) *SPIE Int'l. Symposium, Advanced Algorithms and Architectures for Signal Processing IV*, 8-10 August 1989, SPIE Vol. 1152, pp. 277-287.
18. M. D. Zoltowski and D. Stavrinos, "Computationally Efficient Estimation of the Azimuth and Elevation of Multiple Sources with Planar Sensor Arrays," (invited paper) *Conference Record of the 32nd Midwest Symposium on Circuits and Systems*, 14-15 August 1989, pp. 582-585.
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227. P. Ding, D. J. Love, and M. D. Zoltowski, "Multiple Antenna Broadcast Channels with Limited Feedback," *2006 IEEE International Conference on Acoustics, Speech, and Signal Processing, Proceedings (ICASSP 2005)*, Toulouse, France, 15-19 May 2006, Volume 4, 2006 Page(s):IV-25 - IV-28.
228. Jianqi Wang; Love, D.J.; Zoltowski, M.D.; "User Selection for MIMO Broadcast Channels with Sequential Water Filling," *Proc. of 44-th Annual Allerton Conference on Communications, Systems, and Computing*, Monticello, IL, Sept.27-29 2006.
229. Songnan Xi and M. D. Zoltowski; "Multi-User MIMO Transceiver Design with Transmit Beamforming," *2006 IEEE Military Communications Conference (MILCOM 2006)*, Washington, DC, Oct. 23-25, 2006.
230. Songnan Xi and M. D. Zoltowski; "Uplink Multi-User MIMO Transceiver Design with Transmitting Beamforming Under Power Constraints," *Conference Record of the Fortieth Annual Asilomar Conference on Signals, Systems, and Computers*, Monterey, CA, October 29 - November 1, 2006.

**Invited Lectures:**

1. "Novel Techniques for Estimation of Array Signal Parameters Based on Matrix Pencils, Subspace Rotations, and Total Least Squares," (*invited by Prof. T. Kailath*) Information Systems Laboratory, Stanford University, Stanford, CA, 16 July 1987.
2. "Computationally Efficient Estimation of the Azimuth and Elevation of Multiple Targets/Sources with Planar Sensor Arrays," (*invited by Dr. S. Silverstein*) GE Corporate Research and Development Center, Schenectady, NY, 3 March 1989.
3. "Computationally Efficient Estimation of the Azimuth and Elevation of Multiple Sources with Planar Sensor Arrays," (*invited by Prof. D. Ucci*) Illinois Institute of Technology, Chicago, IL, 14 April 1989.
4. "Incorporating Frequency Diversity and Interference Cancellation in the 3-D Beamspace ML Estimator for Low Angle Radar Tracking," (*invited by Prof. S. Haykin*) McMaster University, Hamilton, Ontario, Canada, 9 October 1989.
5. "A 3-D Beamspace ML Based Bearing Estimator Employing Frequency Diversity and Interference Cancellation," (*invited by Prof. M. Kaveh*) University of Minnesota, Minneapolis, MN, 3 November 1989.
6. "Multifrequency Beamspace Root-MUSIC for Low-Angle Radar Tracking: An Experimental Evaluation," (*invited by Prof. J. Cadzow*) Vanderbilt University, Nashville, TN, 11 March 1991.
7. "Multifrequency Beamspace Root-MUSIC for Low-Angle Radar Tracking: An Experimental Evaluation," (*invited by Dr. W. F. Gabriel*) Radar Division, Naval Research Laboratory, Washington, DC, 18 March 1991.
8. "Multifrequency Beamspace Root-MUSIC for Low-Angle Radar Tracking: An Experimental Evaluation," (*invited by Dr. Kai-Bor Yu*) GE Corporate Research and Development Center, Schenectady, NY, 6 August 1991.
9. "Direction-of-Arrival Estimation in Multipath for Radar and Sonar Applications," (*invited by Dr. Holden*) Shell Development, Houston, TX, 20 September 1991.
10. "Root Versions of Beamspace Eigenstructure Techniques for Direction Finding with Periodic/Aperiodic Antenna Arrays," (*invited by Prof. Y. Bar-Ness*) New Jersey Institute of Technology, Newark, NJ, 7 October 1991.
11. "Root Versions of Beamspace Eigenstructure Techniques for Target Bearing Estimation Large Sensor Arrays" and "Real-Time Frequency and 2-D Angle Estimation with Sub-Nyquist Spatio-Temporal Sampling," (*Distinguished Lecture Series – invited by Prof. D. Linebarger*) University of Texas at Dallas, Dallas, TX, 24-25 February 1993.
12. "Closed-Form 2D Angle Estimation With Circular Arrays/Apertures for Mobile/Cellular Communications and Surveillance Radar," (*invited by Prof. A. Paulraj*) Information Systems Laboratory, Stanford University, Stanford, CA, 4 November 1993.
13. "Antenna Array Processing for Mobile Communications," (*invited by Gregory Cox*) Technical Enrichment Matrix Seminar Series, Land Mobile Products Sector, Motorola, Schaumburg, IL, 17 May 1994.

14. "Blind Adaptive Beamforming for Narrowband Digital Cellular," (*invited by Dr. Roger Hammons*) Hughes Network Systems, Germantown, MD, 8 March 1995.
15. "Dual-Use Smart Antenna Processing for Mobile Communications," (*invited by Dr. Jon A. Sjogren, AFOSR Program Manager*) AFOSR Initiative Workshop on Communications Networks for Command and Control: Signaling/Computing Technologies, Raleigh, NC, 18-19 March 1995.
16. "Blind Adaptive Beamforming for Mobile Communications," (*invited by Gregory Cox*) Technical Enrichment Matrix Seminar Series, Land Mobile Products Sector, Motorola, Schaumburg, IL, 5 September 1995.
17. "Space-Time Processing for Interference Cancellation and Equalization in Narrowband Digital Communications," (*invited by Prof. Ubli Mitra*) SPANN Seminar Series, Department of Electrical and Computer Engineering, Ohio State University, Columbus, OH, 7 October 1996.
18. "Space-Time Processing for Interference Cancellation and Equalization in Narrowband Digital Communications," (*invited by Prof. Athina Petropolu*) Distinguished Lecturer Series, Department of Electrical and Computer Engineering, Drexel University, Philadelphia, PA, 25 November 1996.
19. "Space-Time Signal Processing for Wireless Communications: Equalization and Interference Cancellation," ECE Dept. Colloquium at University of Minnesota (televised), (*invited by Prof. Ahmed Tewfik*) 12 February 1998.
20. "Space-Time Processing for DS-CDMA: Blind Adaptive 2D RAKE Receiver" and "Space-Time Processing for TDMA: Nonparametric Multichannel Equalization and Interference Cancellation" (*invited by Dr. Fred Vook*) Communications Systems Research Lab, Motorola, Schaumburg, IL, 12 March 1997.
21. "Semi-Blind Space-Time Equalization for High-Speed Linear/Nonlinear Modulations Based on Subbanding and the SIMO Cross-Relation" (*invited by Dr. Timothy Thomas*) Communications Systems Research Lab, Motorola, Schaumburg, IL, 18 December 1998.
22. "Overview of Physical Layer Standards and Related Space-Time Signal Processing Research at Purdue University for Third Generation Wireless Communications," ECE Dept. Colloquium at University of Virginia (Eminent Speaker Series), (*invited by Prof. Nikos Sirdopolous*) 12 May 1999.
23. "Overview of Physical Layer Standards and Related Space-Time Signal Processing Research at Purdue University for Third Generation Wireless Communications," ECE Dept. Colloquium at University of Illinois at Chicago, (*invited by Prof. Arye Nehorai*), 2 June 1999.
24. "Space-Time Zero Forcing Equalization for 3G CDMA Forward Link to Restore Orthogonality of OVSA Channel Codes," (*invited by Dr. Carl Panatik*) Texas Instruments, Dallas, TX, 27 September 1999.
25. "Dual-Channel Zero Forcing Equalization for 3G CDMA Forward Link to Restore Orthogonality of OVSA Channel Codes," NCE Cullimore Memorial Distinguished Lecture Series at New Jersey Institute of Technology, Newark, NJ, (*invited by Prof. Yeshkel Bar-Ness*), 1 November 1999.

26. "Space-Time RAKE Receiver/Zero Forcing Equalizer Hybrids for 3G CDMA Forward Link Exploiting Orthogonality of OVSF Channel Codes," ECE Dept. Colloquium at Northwestern University, Evanston, IL, (*invited by Prof. Michael Honig*), 12 November 1999.
27. "Equalization Methods for High-Speed Wireless Digital Communications," (*invited by Louis Litwin*) Seminar Series, Thomson Consumer Electronics, Indianapolis, IN, 30 November 1999.
28. "Reduced-Rank Adaptive Filtering with Application to 3G Wireless Communications," (*invited by Dr. Alan Gatherer*) Texas Instruments, Dallas, TX, 30 November 2000.
29. "Space-Time Equalization and Interference Cancellation for High-Speed CDMA," (*invited by Professor Nosratinia*), **IEEE Signal Processing Society Colloquia** sponsored by Dallas Chapter of IEEE Signal Processing Society, University of Texas at Dallas, Richardson, TX, 1 December 2000.
30. "Reduced-Rank Adaptive Filtering with Application to Chip-Level Equalization for the 3G CDMA Forward Link," University of Southern California, Los Angeles, CA, (*invited by Prof. Irving Reed*), 9 August 2001.
31. "Space-Time Processing for Wireless Communications," *Distinguished Lecture to the Signal Processing Chapter of the Northern Virginia Section of IEEE NOVA* ([http://ece.gmu.edu/~kwage/nova\\_sp/talks\\_2002/zoltowski.html](http://ece.gmu.edu/~kwage/nova_sp/talks_2002/zoltowski.html) ) George Mason University, Fairfax, VA, 20 March 2002.
32. "TUTORIAL ON REDUCED-RANK ADAPTIVE FILTERING BASED ON THE MULTI-STAGE WIENER FILTER," (*invited by Dr. Bruce Suter*), *Tutorial* presented to the *CITE Group* at Rome Labs. Rome, NY, 18 June 2002.
33. "Recent Advances in Space-Time Signal Processing for Wireless Communications," *Invited Lecture*, Department of Electrical and Computer Engineering Colloquium Series, (*invited by Prof. Athina Petropulu*), Drexel University, 28 April 2004.

#### Technical Reports:

1. T.-S. Lee and M. D. Zoltowski, "A 3-D Beamspace ML Based Bearing Estimator Incorporating Frequency Diversity and Interference Cancellation," Technical Report on NSF Grant ECS-8707681, TR-EE 90-6, School of Electrical Engineering, Purdue University, January 1990, 185 pages.
2. D. Stavrinides and M. D. Zoltowski, "Sensor Array Signal Processing Via Eigenanalysis of Matrix Pencils Composed of Data Derived From Translationally Invariant Subarrays," Final Technical Report on NSF Grant ECS-8707681, TR-EE 90-31, School of Electrical Engineering, Purdue University, May 1990, 132 pages.
3. M. D. Zoltowski, G. M. Kautz, and S. I. Chou, "Toward a Robust Minimum Variance Beamformer for Multi-rank Signal Via Minimax Processing," Final Technical Report on NOSC/SDSUF Grant N66001-87-D-0136, TR-EE 91-39, School of Electrical Engineering, Purdue University, Sept. 1991, 71 pages.
4. D. L. Sherman and M. D. Zoltowski, "Novel Techniques for Detection and Estimation of Three-Wave Coupling With Application to Human Brain Waves," TR-EE 93-33, School of Electrical Engineering, Purdue University, Oct. 1993, 166 pages.

5. C. P. Mathews and M. D. Zoltowski, "Signal Subspace Techniques for Source Localization With Circular Sensor Arrays," TR-EE 94-3, School of Electrical Engineering, Purdue University, Jan. 1994, 150 pages.
6. G. M. Kautz and M. D. Zoltowski, "Efficient Beamspace Eigen-Based Direction of Arrival Estimation Schemes," TR-EE 94-15, School of Electrical Engineering, Purdue University, May 1994, 150 pages.

#### **Activities as a Referee:**

1986-present	IEEE Transactions on Signal Processing
1991-1992	IEE Part F: Proceedings on Radar and Signal Processing
1989-1990	IEEE Transactions on Circuits and Systems
1991-1995	IEEE Transactions on Antennas and Propagation
1991-1994	IEEE Transactions on Aerospace and Electronic Systems
1992-present	IEEE Transactions on Communications
1994-present	IEEE Signal Processing Letters
1995-present	IEEE International Conf. on Acoustics Speech & Signal Processing
1996-present	Journal of Circuits, Systems, and Computers
1996-present	IEEE Communications Letters
1999-present	IEEE Transactions on Information Theory

#### **Special Projects:**

1. Freshmen Engineering Seminar Presentation, for School of Electrical and Computer Engineering. Multimedia recruiting presentation. Every Fall (4 sessions) and Spring (1 session) since 2003.
2. Dean's Invitational Seminar for Area High School Teachers, "Applications of Spatially Distributed Sensor Arrays in Radar, Sonar, and Radio Astronomy," Purdue University, 27 October 1988.
3. Faculty Advisor, Beta Chapter, Eta Kappa Nu Honor Society, School of Electrical Engineering, Purdue University - West Lafayette, 1987-present.
4. Science Fair Judge, Lafayette Regional Science and Engineering Fair, Purdue University - West Lafayette, 25 March 1988 and 26 March 1989.
5. Career Counselor, School of Electrical Engineering Undergraduate Counseling Office, Purdue University - West Lafayette, 1988-present.
6. Tours Coordinator - supervised by Curriculum Committee. Organized tours of both undergraduate instructional and graduate research laboratories in EE, Homecoming Weekend Saturday each year, 1992-1994.
7. ECN Short Course Instructor: Beginning Matlab and Advanced Matlab.
  - Spring 1993: Beginning Matlab on 16 February 1993.
  - Fall 1993: Beginning Matlab on 28 September 1993.
  - Spring 1994: Advanced Matlab on 15 February 1994.
  - Fall 1994: Beginning Matlab on 13 September 1994.

- Spring 1995: Advanced Matlab on 1 February 1995.
  - Fall 1995: Advanced Matlab on 31 August 1995.
  - Spring 1996: Advanced Matlab on 1 February 1996.
  - Fall 1996: Advanced Matlab on 4 September 1996.
  - Spring 1997: Advanced Matlab on 6 February 1997.
  - Fall 1997: Advanced Matlab on 12 September 1997.
  - Spring 1998: Advanced Matlab on 27 January 1998.
8. High School Outreach Program, representing School of Electrical Engineering, 11 February 1994.
  9. Women in Engineering Career Day, representing School of Electrical and Computer Engineering, sponsored by Dept. of Freshmen Engineering, 16 October 1995.
  10. Purdue Engineering Recruiting Visit, Indianapolis-South, served on panel representing School of Electrical and Computer Engineering, sponsored by Dept. of Freshmen Engineering, 12 March 1996.
  11. Purdue Student Engineering Foundation (PSEF) Expo '96, representing School of Electrical and Computer Engineering, 19 April 1996.
  12. Women in Engineering Career Day, representing School of Electrical and Computer Engineering, sponsored by Dept. of Freshmen Engineering, 14 October 1996.
  13. Laboratory Tours for ENGR 105H, Freshmen Engineering Honors Seminar, (with Jan Allebach), 28 February 1997.
  14. Purdue Engineering Recruiting Visit, Indianapolis-South, served on panel representing School of Electrical and Computer Engineering, sponsored by Dept. of Freshmen Engineering, 24 March 1997.
  15. Women in Engineering Career Day (with Jan Allebach), representing School of Electrical and Computer Engineering, sponsored by Dept. of Freshmen Engineering, 20 October 1997.
  16. Laboratory Tours for ENGR 105H, Freshmen Engineering Honors Seminar, (with Jan Allebach), 26 February 1999.
  17. Member, *Wireless Panel*, at Purdue CERIAS Symposium on 17 April 2002.  
<http://www.cerias.purdue.edu/events/symposium/>

Explore historical records and family tree profiles about David Zoltowski on MyHeritage, the world's family history network. Records may include photos, original documents, family history, relatives, specific dates, locations and full names. U.S. Yearbooks Name Index, 1890-1979. U.S. Public Records Index. View all records. U.S. Yearbooks Name Index, 1890-1979. David Zoltowski. David Zoltowski. David Zoltowski lived in 1968, at address, Michigan. David Zoltowski. David Zoltowski. David Zoltowski lived in 1969, at address, Michigan. Find family history information in a whole new way. Create a free family tree for yourself or for David Zoltowski and weâ€™ll search for valuable new information for you. Get started. U.S. P