Vita
James L. Lansford, Ph.D.

Experience Summary

Demonstrated leadership as CTO in three cutting edge wireless startups as well as senior positions in established technology companies. Extensive R&D, patent, standards, academic, and regulatory background.

Personal

253 Bridle Lane
Florissant, CO 80816
Strada Academiei 12, Ap. 2
307160 Dumbravita, Romania
(719) 286-8660 (office)
(719) 257-1469 (US cell)
+40 753 631 626 (Romania cell)
jimlansford@outlook.com
Birth Place: Huntland, TN
Citizenship: USA
Long term residence permit: Romania
Work permit valid anywhere in the EU

Education

Ph. D. Electrical Engineering, Oklahoma State University, 1988

- Dissertation topic: L_p Normed models for Speech Coding; Prof. Rao Yarlagadda, advisor. Project funded by NSA.
- Qualifying exam topic: Use of cochlear models in Hidden Markov Model (HMM) speech recognition systems

M.S. Electrical Engineering, Georgia Institute of Technology, 1982
B.S. Electrical Engineering, Auburn University, 1980, with Highest Honors

Honors and Honor Societies

Tau Beta Pi, Sigma Xi, Eta Kappa Nu, Phi Kappa Phi, Phi Eta Sigma, Schlumberger Scholar
Outstanding Engineering Graduate – Alternate, Auburn University, 1980
Best Paper Award ("Wi-Fi – Bluetooth Coexistence"), Windows Hardware Engineering Conference, 2001
Inducted into the Oklahoma State University Collège of Engineering, Architecture, and Technology Hall of Fame, Fall 2022. Also Awarded the Lohmann Medal as a distinguished graduate.

Professional Experience

June 2023-Present **FaraFir Consulting** **Dumbrăviţa, Romania and Florissant Colorado**
Principal
Technical advisor to startup companies, research laboratories, and patent litigation firms.
Expert witness – IEEE 802.11/15 and Wi-Fi technologies
Chair, IEEE 802.11 Wireless Next Generation Standing Committee and Automotive Topic Interest Group
Chair, SAE International Cellular V2X Technical Committee
Delegate, 3GPP RAN/RAN1/RAN4 (AIML applied to Rel-19/20/21)

September 2015 – May 2023 **Qualcomm Technologies, Inc.** **San Diego, CA**
Director, Technical Standards

- Wi-Fi standards, regulations and strategy, with emphasis on automotive communications (V2X, in-vehicle)
- Wi-Fi Alliance Member (Chair, Automotive Marketing Task Group; Chair, Long Term Strategy Task Group)
- 802.11 Member (Chair, 802.11 Wireless Next Generation Standing Committee)
- Board member, OmniAir Consortium (connected vehicle certification)
- SAE Cellular-V2X Technical Committees (Chair)
- FiRa Consortium Regulatory Working Group (Co-chair)

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U.S. Patent 8,219,129

February 2010-September 2015 CSR, plc (acquired by Qualcomm) Cambridge, UK
Fellow, Global Standards

- Head of Wi-Fi Alliance and 802.11 Standards Team
- Bluetooth SIG Member
- Wi-Fi Alliance Member (Chair, DSRC Marketing and Technical Task Groups; Chair, Automotive Marketing Task Group; Chair, Long Term Strategy Task Group, Vice-chair, IoT Connected Home MTG/TTG)
- 802.11 Member (Chair, 802.11 Wireless Next Generation Standing Committee; IEEE 802 to SCC42 liaison; Chair, DSRC Coexistence Tiger Team)
- Intellectual property diligence
- Wi-Fi/802.11 Product strategy
- Strategic customer engagement
- WiMedia Board representative

November 2003-February 2010 Alereon, Inc. Austin, TX
Chief Technology Officer

- Standards and Regulatory Strategy – significant influencer in getting UWB regulations adopted worldwide
- Co-Chair, IEEE 802.15.3a High Rate (UWB) WPAN Task Group
- Chair, WiMedia Technical Steering Committee
- Co-Chair, WiMedia 60GHz Study Group
- Chair, WiMedia Mobile Applications Study Group
- Vice-Chair, WiMedia Video Study Group
- Member, WiMedia Certification Review Board
- Member, Bluetooth Core Spec Working Group
- Future architecture development of MB-OFDM UWB PHY and MAC, including cognitive radio development
- Low Data Rate (LDR) UWB development
- 60GHz strategy and standards
- Managed extensive patent portfolio (over 150 patents and applications)
- Strategic customer engagement
- Advisory board member for Austin Technology Incubator
- Participated in raising over $80M in venture funding

Feb 2000 – Nov 2003 Mobilian Corporation Hillsboro, OR
Chief Technical Officer and Vice President, Business Development

- Responsible for all strategy and tactics with standards bodies (IEEE 802, Bluetooth, ETSI/BRAN, SDR Forum, WECA/WFA)
- Successfully piloted Mobilian proposal in IEEE 802.15.2 to ratification
- Responsible for all regulatory lobbying (FCC, ETSI, ARIB)
- Responsible for strategic engagement with potential partners, including exit candidates – **participated in successful exit with Intel Corporation**
- Management of Business Development team
- Participated in raising over $70M in venture funding

Dec 1996 - Feb 2000 Intel Corporation Hillsboro, OR
Sr. Staff Engineer, Wireless Systems Architect, Communication Architecture Lab

- Chair of Technical Committee Home RF Industry Working Group; responsible for development of HomeRF specification and evangelism
- Led Intel Technical team for IrBus (bi-directional IR control/peripheral system for PC's); IrDA CIR Technical SIG Co-chair
- Technical due diligence on RF wireless investment targets in WPAN, WLAN, and WWAN
- Senior wireless systems architect and internal consultant

March-Dec1996 Mobile Data Systems Colorado Springs, CO President

- Program manager for broadcast AM "subcarrier" system demonstration for Federal Highway Administration ($255k)

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- Program manager for Microsoft interactive Barney radio prototype
- Taught short courses for Lucent on IS-95 CDMA in Guangzhou, China and Jakarta, Indonesia
- Consulting for numerous companies - Comsat, Omnipoint, GE, MIT, Litton, Microsoft and many others

1994 - March 1996 Momentum Microsystems Colorado Springs, CO

Chief Technical Officer, Founder, & Board Member

- System architect for low cost RF networking product ("Aviator") based on a serial bus protocol
- Directed RF design, system analysis (link budget, propagation modeling, MAC strategy) SW/FW development, FCC certification, pre-manufacturing, technical marketing

1990 - 1994 University of Colorado Colorado Springs, CO

Assistant Professor, Electrical and Computer Engineering Department

1990-1994 Assistant Professor
Dept. of Electrical & Computer Engineering
University of Colorado at Colorado Springs
Colorado Springs, CO 80933

- Taught courses in Probability & Statistics, Digital Signal Processing, Radar Systems, Control Theory (digital and analog), Estimation Theory
- Research in digital receiver technology, adaptive noise cancellation techniques and non-linear Kalman filtering

1987-1990, 1980-1982 Georgia Tech Research Institute Atlanta, GA

Principal Research Engineer, Systems Engineering Laboratories

- Principal Investigator for US Air Force study of digital receiver techniques for radar signals ($450k)
- Designed SIMD radar signal processor for US Air Force
- Research on advanced correlator designs for direct sequence spread spectrum
- Developed radar signal analysis software package for US Air Force

1982-1985 Harris Corporation Palm Bay, FL

Senior Engineer and Group Leader, Digital Signal Processing Group

- Project director for multi-DSP communication signal analyzer
- Principal investigator for optical/digital frequency hop analysis system
- Supervisor for 8 engineers and technicians

1976-1980 National Security Agency Ft. Meade, MD

Design and System Engineering

- Designed, built, and debugged encryption system
- Designed and developed signal collection and analysis system
- Wrote signal propagation simulation software package

Other Experience

1986-1987 Graduate Research Assistant and Lecturer
Oklahoma State University
Stillwater, OK 74078

1996-Present Various short courses, tutorials, and seminars on Communication Technology and Digital Signal Processing
Short Course on IS-95 – Guangzhou, China and Jakarta, Indonesia
Short Course on OFDM Modem Design – Kuala Lumpur, Malaysia
Short Course on UWB and Wireless USB – Singapore
Short Course on Wireless WAN/LAN/PAN – Singapore
Short Courses on Wireless Communications (Washington, DC and Tampa, FL…sponsored by Armed Forces Communications and Electronics Association)

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1999	Adjunct professor, Electrical Engineering, Oklahoma State University Taught Digital Signal Processing
2008-2011	Visiting Associate Professor, Electrical Engineering, Texas State University Developing Digital Signal Processing and Signals & Systems curricula
2009	Lecturer at University of Texas at Austin Electrical Engineering, Digital and Analog Communications
2010-Present	**Adjunct Professor, University of Colorado at Boulder** **Computer Science / Technology, Cybersecurity and Policy Graduate program – Data Communications and WLAN**

Professional Activities

- Life Senior Member, IEEE (Communication Society)
- Technical Chairman, 1992 IEEE International VTS Conference
- Chair, HomeRF Technical Committee, 1997-2000
- Founding Chair, IEEE 802.19 Wireless Coexistence Technical Advisory Group
- Chair, IEEE 802.15.2 PHY layer task group
- Co-Chair, IEEE 802.15.3a Ultrawideband PHY task group
- Technical Program Committee, Globecom '98, ICUWB 2006/2007/2008/2009/2010
- Panel Chair, IEEE Vehicular Networking Conference 2014/2015/2016/2017/2018/2019/2020/2021/2023
- Co-Editor, JSAC Special Issue on Gigabit Wireless
- Practice Analysis Task Force, IEEE Wireless Communication Engineering Technologies Certification
- **Certified IEEE Wireless Communication Professional**
- **ABET Program Evaluator, Electrical Engineering**

Research Grants

- Federal Highway Administration, "Herald AM Subcarrier Study" $320k, 1996
- Wright-Patterson AFB, "Digital Receiver Techniques for Radar" $450k, 1989
- Rome Air Development Center, "High Resolution Spectral Estimation", $155k, 1988
- Warner-Robins ALC, "Improved Direction Finding Techniques" $90k, 1988

Courses Taught

Digital Signal Processing, Communication Theory, Radar Systems, Estimation Theory, Digital control systems, (classical) Control theory, Network Analysis, Signals and Systems, Wireless Local Area Networks

Other Professional Activities

Patents Granted:

6,163,568 Broadband, low power FM/FSK transceiver for wireless communications systems
6,343,071 Wireless Desktop Area Network
EP1264416 Bluetooth-HomeRF Coexistence
6,751,251 Fixed frequency transceiver for use in a frequency hopping system
6,937,158 Bluetooth-HomeRF Coexistence
6,594,302 Frequency hopping coexistence with non-frequency hopping systems
7,184,938 Statistical filters
7,536,282 Statistical filters
7,782,924 Method and system for windowing
8,018,831 Method and system for a scalable radio architecture
8,116,402 Method and system for cognitive radio
8,467,284 Method and system for a scalable radio architecture
11,412,524 Techniques to synchronize radio access technologies for co-channel operation
11,758,379 Automated Assessment of a Towed Object Dimensions

Consulting contracts with:

Comsat Systems Division, Germantown, MD
Microsoft, Bellevue, WA
Advanced Communication Systems, Gaithersburg, MD
Micromirror Corporation, Colorado Springs, CO
MIT Lincoln Laborarory, Lexington, MA
Sage Alerting Systems, Norwalk, CT
Loral Western Development Laboratories, San Jose, CA
Array Microsystems, Colorado Springs, CO
General Electric Corporate R&D Center, Schenectady, NY
Omnipoint Corporation (now T-Mobile), Colorado Springs, CO
Electronic Systems Products, Atlanta, GA
BDM Corporation, Boulder, CO and Columbia, MD
Litton Applied Technology, San Jose, CA
Scientific Atlanta, San Diego, CA
Time Domain Corporation, Huntsville, AL
DeepSig, Alexandria, VA
Toyota Motor Corporation, Mountain View, CA

Expert Witness experience

Participated as expert witness in various patent litigation cases (details confidential – available upon request)

Publications and Presentations

1. "Data Offload for Connected Vehicles using Wi-Fi," IEEE Vehicular Networking Conference, Kobe (Japan), May 2024 (Invited talk and panel moderator)

2. "LTE-V2X Technology and Standards," IEEE Conference on Standards for Communications and Networking, Munich (Germany), November 2023.

3. "Reliable, Low-Latency Wireless Communication – Overview and Challenges," Luxembourg Institute of Science and Technology Conference on The Role of Connectivity in Industrial Automation, Luxembourg, October 2023 (invited keynote)

4. "Overview of the 802.11 Working Group – New Amendments: Markets, use cases, and key technologies," COST/INTERACT 6th MCM & Technical Meeting, Poznan (Poland), September 2023 (invited keynote)

5. "Edge Computing - what role will it play in V2X communication?", IEEE Vehicular Networking Conference, Istanbul (Turkey), April 2023 (Invited talk and panel moderator)

6. "A Tutorial on the LTE-V2X Direct Communication" *IEEE Open Journal of Vehicular Technology*, vol 3, 2022, pp. 388-398, co-author (Invited Paper)

7. "The information superhighway for vehicles of the future - how many lanes of bandwidth?", IEEE Vehicular Networking Conference, Ulm (Germany), December 2021 (Invited talk and panel moderator)

8. "V2X Spectrum – Where do we go from here?" IEEE Vehicular Networking Conference, Virtual meeting, December 2020 (Invited talk and panel moderator)

9. "Will 5G, Sensors and AI replace the need for Direct V2V?," IEEE Vehicular Networking Conference, Los Angeles (USA), December 2019 (Invited talk and panel moderator)

10. "V2X Communication Requirements for Autonomous Vehicles," IEEE Vehicular Networking Conference, Taipei (Taiwan), December 2018 (Invited talk and panel moderator)

11. "The Future of V2X: Where we are and where we are going," IEEE Vehicular Networking Conference, Torino (Italy), December 2017 (Invited talk and panel moderator)

12. "The Future of V2X Communication," IEEE Vehicular Networking Conference, Columbus, Ohio (USA), December 2016 (Invited talk and panel moderator).

13. "The Future of Vehicular Networks: In-vehicle, V2V, and V2I," IEEE Vehicular Networking Conference, Kyoto, Japan, December 2015 (Invited talk and panel moderator).

14. "The Connected Car is Here!" Wi-Fi Global Congress, San Jose, October 2015 (Invited talk and panel moderator)

15. "Band Sharing Between Unlicensed Devices and ITS/DSRC Systems in the 5.9 GHz Band," ISART 2015: Measurements, Models, Simulations, and Technologies for Improved Spectrum Sharing, Boulder, May 2015.

16. "The Connected Car," Wi-Fi Global Congress, London, May 2015 (Invited talk)

17. "The Future of the Connected Car," IEEE Vehicular Networking Conference, Paderborn, Germany, December 2014 (Invited talk for industry panel).

18. "The Future of the Connected Car: Wireless on Wheels," eRocks Bangalore, October 2014 (keynote talk).

19. "Issues in Band Sharing Between DSRC and Wi-Fi – the IEEE DSRC Coexistence 'Tiger Team,'" ITS World Congress, Detroit, Michigan, September 2014 (Invited talk).

20. "Wi-Fi as a Commercial Service: New Technology and Policy Implications," *Telecommunication Policy*, The International Journal of ICT Economy, Governance and Society, Elsevier Press, September 2014.

21. "Opportunities and Challenges for the Connected Car," CeBIT 2014, Hannover, Germany, March 2014 (Invited talk).

22. "Coexistence of Unlicensed Devices with DSRC Systems in the 5.9 GHz ITS Band," IEEE Vehicular Networking Conference, Boston, December 2013, co-author.

23. "802.11 and 802.15 Standards in Vehicular Applications" The 2nd International Conference on Connected Vehicles & Expo, Las Vegas, December 2013 (invited talk).

24. "UWB – How did we get here, and where are we going?" Keynote speech, IEEE International Conference on Ultrawideband, Sydney, September 2013.

25. "UWB in the "Gray Spaces": Spectral Sharing and Sculpting," IEEE International Conference on Ultrawideband, Sydney, September 2013 (invited talk).

26. "Wi-Fi as a Commercial Service: New Technology and Policy Implications," Telecommunications Policy Research Conference, TPRC-41, September 2013, co-author.

27. "The future of UWB," 2010 IEEE International Conference on Ultra-Wideband (ICUWB), Nanjing, China, September 2010.

28. "Cognitive UWB Radio: A Smarter Radio for Smarter Products," 2009 IEEE International Conference on Systems, Man, and Cybernetics, San Antonio, Texas, October 2009.

29. "The WiMedia UWB Radio: Is It The Ideal Cognitive Radio Processor?," International Conference on Ultrawideband, Hannover, Germany, 2008

30. "Detect and Avoid (DAA) for UWB: Implementation Issues and Challenges," IEEE 18th International Symposium on Personal, Indoor and Mobile Radio Communications, September 2007.

31. "Technology Tradeoffs for a Worldwide UWB Transceiver," Ultra-Wideband, 2007. ICUWB 2007. IEEE International Conference on, 24-26 Sept. 2007, pp. 259-263, co-author.

32. "UWB- Have we arrived?," Proceedings of the 17th Annual Symposium on Personal, Indoor, and Mobile Communications, Helsinki, Finland, 2006, co-author

33. "Modified Adjacent Frequency Coding for Increased Notch Depth in MB-OFDM under DAA/Spectral Sculpting," 1st International Conference on Cognitive Radio Oriented Wireless Networks and Communications, 2006., co-author.

34. "Multiband-OFDM and Cognitive Radio for WiMax Coexistence," International Conference on Ultrawideband, ICUWB 2005, Zurich, Switzerland

35. "Broadband Fixed Wireless Coexistence with WiMedia-UWB," China Conference on Ultrawideband 2005, Nanjing, China, 2005, co-author

36. "Use Of Cognitive Radio Techniques For OFDM Ultrawideband Coexistence With WiMax," University of Texas Wireless Networking and Communications Conference, 2005, co-author

37. "Analysis and Design of a Statistical Filter using Markov Chain Markov Processes for the coexistence of WLAN and WPAN," Global Signal Processing and Expo (GSPx), Santa Clara-CA, September 2004, co-author

38. "UWB coexistence and cognitive radio," Ultra Wideband Systems, 2004. Joint with Conference on Ultrawideband Systems and Technologies. Joint UWBST & IWUWBS. 2004 International Workshop on, 18-21 May 2004 Page(s):35 - 39

39. "Bluetooth and Wi-Fi Coexistence," University of Texas Wireless Networking and Communications Conference, October 2003

40. "Convergence of Wireless PANs, LANs, and WANs", Communications Design Conference, September 2003

41. "Interference in the ISM Bands: Bluetooth and 802.11b Coexistence," Defense Science Research Council meeting, May 2003.

42. "The Challenge and Opportunity of Multi-standard Radio Technology" Intel Seminar on Reconfigurable Radio Technology, May 2003

43. "The Path to Coexistence between Wi-Fi and Bluetooth" CTIA Mobile Healthcare Conference, October 2002.

44. "Multi-radio Support in Portable Computing: Enabling Anytime, Anywhere Connectivity" Communications Design Conference, September 2002, co-author

45. "Coexistence; Making Wireless Work in Shared Spectrum," Nikkei NE Wireless Forum, June 2002.

46. "Coexistence and Interoperability: Making WLAN work in the real world," Wi-Fi World Congress, October 2002.

47. “The RF spectrum: is all the beachfront property gone?” Information, Decision and Control, 2002. Final Program and Abstracts. 11-13 Feb. 2002 Page(s):16-16

48. “Bluetooth and Wi-Fi Coexistence,” Midwest Symposium on Circuits and Systems, 2002.

49. “Adaptive Frequency Hopping,” Bluetooth Developer’s Conference, December 2001

50. “Wi-Fi and Bluetooth: Enabling Coexistence” IEEE Network Magazine, September 2001.

51. “Wi-Fi and Bluetooth: An Examination of Coexistence Approaches” 2001 Windows Hardware Engineering Conference Proceedings, April 2001, co-author (Best paper award)

52. “Managing The Interference Challenges In The Densely Utilized 2.4 GHz Environment” WLAN Forum, February 2001.

53. “The Design and Implementation of HomeRF: A Radio Frequency Wireless Networking Standard for the Connected Home,” Proceedings of the IEEE, vol. 88, No. 10, October 2000, co-author.

54. HomeRF(TM)/SWAP: a wireless voice and data system for the home, Acoustics, Speech, and Signal Processing, 2000. ICASSP '00. Proceedings. 2000 IEEE International Conference on, Volume 6, 5-9 June 2000 Page(s):3718 - 3721 vol.6

55. “HomeRF: Wireless Networking for the Connected Home” IEEE Personal Communications Magazine, February 2000, co-author.

56. “HW and SW in embedded system design: Loveboat, Shipwreck, or Ships Passing in the Night?,” Proceedings of the 36th ACM/IEEE conference on Design automation, New Orleans, Louisiana, United States, Pages: 76 – 77, 1999, ISBN:1-58133-109-7, co-author

57. A prototype subcarrier system to transmit digital data over commercial AM radio, Global Telecommunications Conference, 1998. GLOBECOM 98. The Bridge to Global Integration. IEEE, Volume 3, 8-12 Nov. 1998 Page(s):1473 - 1478 vol.3, co-author

58. “Universal Cordless Telephone Transceivers Using DSP”, Virginia Tech Conference on Mobile and Personal Communications, June 1997.

59. Simulation of RBDS AM subcarrier modulation techniques to determine BER and audio quality, Wireless personal communications: the evolution of personal communications systems archive, Pages: 195 – 199, 1996, ISBN:0-7923-9676-6

60. “A CSMA/CA Protocol For Wireless Desktop Communications”, *Wireless Personal Communications: The Evolution Of Personal Communications Systems*, Pages: 51 – 58, 1996, ISBN:0-7923-9676-6

61. “Lp Normed Modeling of Speech”, *Signal Processing*, 1995, co-author.

62. “Simulation of RBDS AM subcarrier modulation techniques to determine BER and audio quality,” Vehicular Technology Conference, 1995 IEEE 45th, Volume 2, 25-28 July 1995 Page(s):942 - 946 vol.2, co-author

63. "Interaction Between AGC and Quantizer in a Direct Sequence Spread Spectrum System", International Symposium on Spread Spectrum Techniques and Applications, July 1994, Oulu, Finland, co-author.

64. “Model based filter design by minimizing median of square of residuals,” Vehicular Technology Conference, 1994 IEEE 44th 8-10 June 1994 Page(s):476 - 478 vol.1, co-author

65. "Mixed urban/suburban propagation measurements for PCS in the OFS band, Vehicular Technology Conference, 1994 IEEE 44th 8-10 June 1994 Page(s):934 - 937 vol.2, co-author

66. "Time domain algorithm for the estimation of two sinusoidal frequencies," Vision, Image and Signal Processing, IEE Proceedings, Volume 141, Issue 1, Feb. 1994 Page(s):33 – 38, co-author

67. "Two Frequency Estimation Without Multiplication", *IEE Trans.*, Nov. 1992, co-author.

68. "Advances in objective voice quality assessment," Vehicular Technology Conference, 1992 IEEE 42nd 10-13 May 1992 Page(s):155 - 158 vol.1, co-author

69. "Robust FSK sinusoidal frequency estimation," Acoustics, Speech, and Signal Processing, 1992. ICASSP-92., 1992 IEEE International Conference on, 23-26 Mar 1992.

70. "Efficient Parallel Rooting of Complex Polynomials on the Unit Circle", *IEEE Trans ASSP*, Oct. 1991, co-author.

71. "Robust models for neural signal processing," Acoustics, Speech, and Signal Processing, 1990. ICASSP-90., 1990 International Conference on 3-6 April 1990 Page(s):2439 - 2441 vol.5, co-author

72. "L_p Normed Model Based Filter Design," Signals, Systems and Computers, 1990. 1990 Conference Record Twenty-Fourth Asilomar Conference on Volume 1, 5-7 Nov 1990 Page(s):303, co-author

73. "Application of Model Based Spectral Estimation Techniques to Real Data," Signals, Systems and Computers, 1990. 1990 Conference Record Twenty-Fourth Asilomar Conference on Volume 1, 5-7 Nov 1990 Page(s):452, co-author

74. "Robust Noise Suppression Techniques for Neural Signals", IEEE Engineering in Medicine and Biology Society Conference Proceedings, 1989, co-author.

75. "Robust Spectral Estimation in the Presence of Multipath", Twenty-third Asilomar Conference on Signals, Systems, and Computers, 1989, co-author.

76. "Optimal p-Gaussian Models and Their Application", EUSIPCO-88 Proceedings, co–author.

77. "Optimal L_p Approach to Speech Coding", ICASSP–88 Proceedings, co–author.

78. "Use of Markov Chains for Spectral Shaping", MILCOM–87 Proceedings, co–author.