

Exhibit A

Allen Gersho

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Education

Ph. D. (E.E.) Cornell University, 1963.
M.S. (E.E.) Cornell University, 1961.
B.S. (E.E.) Massachusetts Institute of Technology, 1960.

Experience

2001-present

Expert consultant to law firms.
Professor Emeritus & Research Professor, UCSB.

4/2000 – 4/2001

Digital Media Architect, Microsoft Corporation

9/1996 - 3/2000

CEO and co-founder, SignalCom, Inc. (Acquired by Microsoft April 2000)

1980 - 1998:

Professor, Electrical & Computer Engineering, University of California, Santa Barbara.
Research in speech, audio, image and video compression, and vector quantization techniques. Directed the Signal Compression Laboratory.

1981- present:

Independent Consultant. Consulting services in audio compression and other areas of signal processing and telecommunications. Expert consulting for intellectual property law firms.

1987 - Present:

President and founder, VoiceCraft, Inc. - technology licensing.

1981-1991

Sole Proprietor, Technology Tutorials. Lecturer and administrator, public and in-plant continuing education short courses in digital telephony. Consulting services.

1988-1993:

Director, Center for Information Processing Research, University of California, Santa Barbara. Research in signal processing and communications.

1984-1989:

Principal Investigator of a research project on high-quality speech compression at 4800 bp/s for the NASA Mobile Satellite Experiment sponsored by Jet Propulsion Laboratory for NASA.

1980-1981:

Consultant, Signal Technology, Inc.

1963-1980

Member of Technical Staff, AT&T Bell Laboratories. Research activities in digital communications, adaptive signal processing, quantization, and other areas.

Publications

About 300 technical research papers in various areas of speech, audio, image and video processing and compression, digital communications, data transmission, signal processing, solid-state circuits, spectroscopy, and biophysics. Many papers have since been reprinted in collections of benchmark papers in IEEE Press and other reprint books and three have won prize paper awards. Author of the book Vector Quantization and Signal Compression, (760 pages), with R. M. Gray, published 1992, by Kluwer Academic Publishers, currently in its 8th printing, Japanese translation published in 1998. Co-editor with B.S. Atal, and V. Cuperman of Advances in Speech Coding, published 1991, and of Advances in Speech and Audio Coding for Wireless and Network Applications, published 1993, both by Kluwer Academic Publishers.

Lectures

Many invited lectures at universities and corporations around the world on current research results in speech compression and other areas; tutorial training courses in digital telecommunications and signal processing for corporate and academic continuing education programs. NATO AGARD Invited Lecturer on Speech Coding for Man-Machine Speech Communications Lecture Series, Turkey/Norway/U.S., 1990. Invited lecturer on Speech Coding for NATO Advanced Study Institute, Bubion, Spain, 1993. Invited plenary lectures: 1994 European Conference on Signal Processing, 1995 IEEE Workshop on Speech Coding for Telecommunications.

Patents

About 20 issued U.S. patents and several international counterparts on speech, audio compression, digital filtering, adaptive equalization, channel coding/modulation, and adaptive quantization.

Professional Activities

Member Technical Program Committee, IEEE Workshop on Speech Coding for Telecommunications, St. Jovite, Quebec, Canada, 1993.
Member Technical Program Committee, IEEE Workshop on Speech Coding for Telecommunications, Whistler, B.C. Canada, 1991.
Co-Chairman, IEEE Workshop on Communication Theory, Ojai, June 1990.
Associate Editor of the IEEE Transactions on Communications
Co-Chairman, IEEE Workshop on Speech Coding for Telecom., Vancouver, Sept. 1989
Member, IEEE Kilby Medal Award Committee, 1997-1999
Member Fellow Award Committee, Acoustics, Speech, Signal Proc. Society, 1991-99
Member Awards Board, IEEE Communications Society, 1990-1993.
Member Board of Governors, IEEE Communications Society, 1982-85.
General Chairman and founder, CRYPTO 81, conference on cryptography.
Editor, IEEE Communications Magazine, 1978-80.
Frequent editorial duties for IEEE journals.
Member, IEEE technical committees on signal processing and communication theory.

Awards and Honors

IEEE James L. Flanagan Speech and Audio Processing Award, 2007.
Society Award, IEEE Signal Processing Society, 2003
IEEE Millennium Medal, 2000.
Ericsson-Nokia Prize Paper Award, 1999.
Circuits and Systems Video Technology Prize Paper Award, 1992.
Guillemin-Cauer Prize Paper Award, 1978.
NASA Tech Brief Awards for technical innovation, 1987, 1988, 1992.
IEEE Centennial Medal, 1984.
Donald McLellan Meritorious Service Award, IEEE, 1983
Elected Fellow of the IEEE, 1982.

ALLEN GERSHO: Publications (1963-Present)

1. A. Gersho, "Characterization of Time-Varying Linear Systems," Proc. IEEE, vol. 51, p. 238, January 1963.
2. A. Gersho, "Characterization of Randomly-Varying Linear Systems," Proc. IEEE, vol. 51, p. 399, February 1963.
3. A. Gersho, "Characterization of Time-Varying Linear Systems," Cornell Univ. Research Report EE559, Ph.D. Dissertation, Cornell University, June 1963.
4. A. Gersho and N. DeClaris, "Duality Concepts in Time-Varying Linear Systems," IEEE Int. Convention Record, Part 1, pp. 344-356, 1964.
5. B. K. Kinariwala and A. Gersho, "A Stability Criterion for Non-uniformly Sampled and Distributed Parameter Systems," Bell System Technical Journal, vol. 45, pp. 1153-1155, September 1966.
6. A. Gersho, "Automatic Time-Domain Equalization with Transversal Filters," Proc. National Electronics Conf., vol. 22, pp. 928-933, October 1966.
7. A. Gersho, "Pulse Stretching with Time-Varying Networks," Proc. IEEE, vol. 54, pp. 1574-1575, November 1966.
8. A. Gersho and B. J. Karafin, "Mutual Synchronization of Geographically Separated Oscillators," Bell System Technical Journal, vol. 45, pp. 1689-1704, December 1966.
9. A. Gersho, "Properties of a Class of Nonlinear Systems," Proc. First Annual Princeton Conf. on Information Sciences and Systems, pp. 163-166, March 1967.
10. A. Gersho and S. L. Freeny, "Performance Capabilities of Transversal Equalizers for Digital Communication," Conf. Digest, IEEE Int. Conf. on Communication, Minneapolis, June 1967.
11. A. Gersho, "Automatic Equalization of Highly Dispersive Channels for Data Transmission," Proc. Int. Symposium on Information Theory, San Remo, Italy, September 1967.
12. A. Gersho, "Automatic Equalization of Highly Dispersive Channels for Data Transmission," Abstract in IEEE Trans. on Information Theory IT-14, No. 6, pp. 834, November 1968.
13. A. Gersho, "Adaptation in a Quantized Parameter Space," Proc. Sixth Annual Allerton Conf. on Circuit and Systems Theory, pp. 646-653, Monticello, IL, October 1968.
14. A. Gersho and B. K. Kinariwala, "A Synthesis Algorithm for Cascaded Transmission Lines," Proc. Sixth Annual Allerton Conf. on Circuit and System Theory, pp. 889-898, Monticello, IL, October 1968.
15. A. Gersho, "Convergence Properties of an Adaptive Filtering Algorithm," Proc. Second Asilomar Conf. on Circuits and Systems, pp. 302-304, October 1968.
16. A. Gersho, "Adaptive Equalization of Highly Dispersive Channels for Data Transmission," Bell System Technical Journal, vol. 48, No. 1, pp. 55-70, January 1969.

17. A. Gersho, "Nonlinear Systems with a Restricted Additivity Property," IEEE Trans. on Circuit Theory CT-16, No. 2, pp. 150-154, May 1969.
18. A. Gersho, "Solving Nonlinear Network Equations Using Optimization Techniques," Bell System Technical Journal, vol. 48, No. 9, pp. 3135-3138, November 1969.
19. A. Gersho, "Some Aspects of Linear Estimation with Non-Mean-Square Error Criteria," Proc. Third Asilomar Conf. on Circuits and Systems, Pacific Grove, CA, December 1969.

1970-1980

20. A. Gersho, "Linear Adaptation," Proc. 1969 Polytechnic Institute of Brooklyn Symposium on Computer Processing in Commun.. 1970.
21. A. Gersho, Review of: "Circuit Theory: An Introduction to the State Variable Approach," R. A. Rohrer, McGraw-Hill: IEEE Spectrum, July 1970.
22. A. Gersho and D. J. Goodman, "Projecting Filters for Recursive Prediction of Discrete-Time Processes," Bell System Technical Journal, vol. 49, No. 10, pp. 2377-2403, December 1970.
23. A. Gersho, "Adaptive Equalization for Data Transmission," Proc. National Electronics Conf., vol. 26, pp. 154-157, December 1970.
- 23A. A. Gersho, "Adaptive Filtering with Binary Reinforcement," IEEE Inter. Conf. Information Theory, Asilomar, (abstract) Jan. 1972.
- 23B. A. Gersho, "Stochastic Stability of Delta Modulation," IEEE Inter. Conf. Information Theory, Asilomar, (abstract) Jan. 1972.
24. A. Gersho, "Stochastic Stability of Delta Modulation," Bell System Technical Journal, vol. 51, No. 4, pp. 821-841, April 1972.
25. A. Gersho, Review of: "Adaptive Filters," Aspects of Network and System Theory, B. Widrow, (ed. R.E. Kalman and N. DeClaris), Holt, 1971; IEEE Circuit Theory Group Newsletter, vol. 6, No. 2, pp. 14-15, April 1972.
26. D. J. Goodman and A. Gersho, "Theory of an Adaptive Quantizer," Proc. of 1973 IEEE Symposium on Adaptive Processes, Decision and Control, pp. 361-365, December 1973.
27. D. J. Goodman and A. Gersho, "Adaptive Quantization of Speech: Static and Dynamic Performance," Proc. 8th Int. Congress on Acoust., London, England, (Abstract) p. 249, July 1974.
28. D. J. Goodman and A. Gersho, "Theory of an Adaptive Quantizer," IEEE Trans. on Commun., vol. COM-22, No. 8, pp. 1037-1045, August 1974.
29. A. Gersho and D. J. Goodman, "A Training Mode Adaptive Quantizer," IEEE Int. Symposium on Information Theory, Notre Dame, Indiana, (Abstract) pp. 65-66, October 28-31 1974.
30. A. Gersho and D. J. Goodman, "A Training Mode Adaptive Quantizer," IEEE Trans. on Information Theory, vol. IT-20, No. 6, pp. 746-749, November 1974.
31. A. Gersho and D. Mitra, "A Simple Growth Model for the Diffusion of a New Communication Service," IEEE Trans. on Systems, Man and Cybernetics, vol. SMC-5, pp. 209-216, March 1975.

32. A. Gersho and B. Gopinath, "Filtering with Charge Transfer Devices," Proc. IEEE Int. Symposium on Circuits and Systems, pp. 183-186, April 1975.
33. A. Gersho, "Recursive Filtering with Charge Transfer Devices," Conf. Record IEEE Int. Conf. on Communication, pp. 2.15-2.19, June 1975.
34. A. Rosencwaig and A. Gersho, "Photoacoustic Effect with Solids: A Theoretical Treatment," Science, vol. 190, pp. 556-557, November 1975.
35. A. Gersho, "Charge-Coupled Devices: The Analog Shift Register Comes of Age," IEEE Commun. Society Magazine, vol. 13, No. 6, pp. 27-32, November 1975.
36. A. Gersho, "Adaptive Equalization of Highly Dispersive Channels for Data Transmission," (reprint of 1969 paper), in Data Transmission, L.E. Franks, editor, Dowden, Hutchinson and Ross, 1975.
37. A. Rosencwaig and A. Gersho, "Theory of the Photoacoustic Effect with Solids," J. Appl. Phys., vol. 47, No. 1, pp. 64-69, January 1976.
38. A. Gersho and B. Gopinath, "Multiplexed Filtering with Charge Transfer Devices," IEEE J. Solid-State Circuits, February 1976.
39. D. J. Goodman and A. Gersho, "Theory of an Adaptive Quantizer," Waveform Quantization and Coding, (reprint of 1974 paper), IEEE Press, N.S. Jayant, editor, 1976.
- 39a. D. J. Goodman and A. Gersho, "On a Class of Adaptive Quantizers," IEEE Inter. Symp. Information theory, (Abstract) June 1976.
40. M. Orentlicher and A. Gersho, "a Quantitative Model for Actin Myosin Interaction in Skeletal Muscle" Biophysical Journal, vol. 18, pp.141-159, April 1977
41. A. Gersho, "Quantization," IEEE Commun. Society, vol. 15, No. 5 pp. 16-29, September 1977
- 41a. A. Gersho, "Asymptotically Optimal Block Quantization," (Abstract), Conf. Digest, IEEE Int. Symposium on Information Theory, Ithaca, NY October 1977.
42. A. Gersho and B. Gopinath, "Charge-Routing Networks," Proc. IEEE Int. Conf. on Circuits and Systems, May 1978.
43. A. Gersho, Review of Book: Charge-Coupled Devices: Technology and Applications, by R. Melen and D. Buss, IEEE Press, IEEE Trans. Acoust. Speech, Signal Processing, April 1978.
44. A. Gersho, "Principles of Quantization," IEEE Trans. on Circuits and Systems, (Invited Paper) vol. CAS-25, No. 7, pp. 426-427, July 1978.
45. A. Gersho, "Communications Privacy," IEEE Commun. Magazine, November 1978.
46. A. Gersho and B. Gopinath, "Charge-Routing Networks," IEEE Trans. Circuits and Systems, vol. CAS-26, No. 2, pp. 81-92, February 1979.
47. A. Gersho, "Charge Transfer Filtering" (Invited Paper) Proc. IEEE, vol. 67, No. 2 pp. 196-218, February 1979.
48. A. Gersho, B. Gopinath, and A. Odlyzko, "Coefficient Inaccuracy in FIR Filters," Proc. IEEE Int. Conf. Acoust., Speech, Signal Processing, pp. 375-377, 1979.

49. A. Gersho, "On Perfect Secrecy Encryption of Analog Signals," (Abstract), Conf. Digest, IEEE Int. Symposium on Information Theory, Trieste, Italy, June 1979.
50. A. Gersho, "Asymptotically Optimal Block Quantization," IEEE Trans. on Inform. Theory, vol. IT-25, No. 4, pp. 373-380, July 1979
51. A. Gersho, B. Gopinath, and A. Odlyzko, "Coefficient Inaccuracy in Transversal Filtering," Bell System Tech. J., vol. 58, No. 10, pp. 2301-2316, December 1979.
52. A. Gersho, "Encryption of Analog Signals: Scrambling versus Digitization," Conf. Record, IEEE National Telecommunications Conf., December 1979.

1981

53. A. Gersho, "Readings in Pulse-Code Modulation," (Book Review) IEEE Commun. Magazine, vol. 19, No. 5, September 1981.
54. A. Gersho, "Performance Bounds for Analog Signal Encryption," Proc. 1981 Int. Telemetering Conf., pp. 133-138, October 1981.
55. A. Gersho and T.L. Lim, "Adaptive Cancellation of Intersymbol Interference for Data Transmission," Bell System Tech. J., vol. 60, No. 9, pp. 1996-2011, November 1981.
56. A. Gersho, "A Structural Approach to Vector Quantization," Proc. National Telecomm. Conf., New Orleans, pp. F4.1-F4.5, November 1981.

1982

57. A. Gersho, "On the Structure of Vector Quantizers," IEEE Trans. Inform. Theory, vol. 28, No. 2, pp. 157-166, March 1982.
58. A. Gersho and B. Ramamurthi, "Image Coding Using Vector Quantization," Proc. Calspace Investigators Conf., pp. 41-43 March 1982.
59. A. Gersho and B. Ramamurthi, "Image Coding Using Vector Quantization," Proc. IEEE Int. Conf. Acoust., Speech, Signal Processing, pp. 428-431 May 1982.
60. V. Cuperman and A. Gersho, "Adaptive Differential Vector Coding of Speech," Conf. Record, IEEE Global Telecomm. Conf., pp. 1092-1096, December 1982.

1983

61. B. Ramamurthi and A. Gersho, "Image Coding Using Segmented Codebooks," Proc. Int. Picture Coding Symposium, PCS 83, pp. 44-45, Davis, March 1983.
62. Cheng-Shu Wang and A. Gersho, "A Bound on the Number of Nearest Neighbors of a Euclidean Code," (Abstract), Conf. Digest, IEEE Int. Symp. on Inform. Theory, p. 43, September 1983.
63. A. Gersho and V. Cuperman, "Vector Predictive Source Coding" (Abstract), Conf. Digest, IEEE Int. Symp. on Inform. Theory, pp. 44-45 September 1983.
64. A. Gersho and D. Y. Cheng, "Fast Nearest Neighbor Search for Nonstructured Euclidean Codes," (Abstract), Conf. Digest, IEEE Int. Symp. on Inform. Theory, p.88, September 1983.

65. A. Gersho, "Quantization" (reprint of 1977 paper), in *Tutorials in Modern Commun.*, V.B. Lawrence, J. L. LoCicero, and L. B. Milstein, eds., Computer Science Press, Rockville, Maryland. pp. 5-14, 1983.
66. A. Gersho, "Charge-Coupled Devices: The Analog Shift Register Comes of Age," (reprint of 1975 paper), in *Tutorials in Modern Commun.*, V. B. Lawrence, J. L. LoCicero, and L. B. Milstein, eds., Computer Science Press, Rockville, Maryland. pp. 260-265, 1983.
67. A. Gersho and V. Cuperman, "Speech Waveform Coding Using Vector Quantization," *Conf. Record, Conf. Record, IEEE Global Telecomm. Conf.*, pp. 193-197-December 1983.
68. B. Ramamurthi, A. Gersho and A. Sekey, "Low-Rate Image Coding Using Vector Quantization," *Conf. Record, Conf. Record, IEEE Global Telecomm. Conf.*, pp. 184-187, December 1983.
69. A. Gersho and V. Cuperman, "Vector Quantization: A Pattern Matching Technique for Speech Coding," *IEEE Commun. Magazine*, vol. 21, No. 9, pp. 15-21, December 1983.

1984

70. A. Gersho, "Adaptive Filtering with Binary Reinforcement," *IEEE Trans. Inform. Theory*, vol.IT-30, pp. 191-199, March 1984.
71. A. Gersho and Yair Shoham, "Hierarchical Vector Quantization of Speech with Dynamic Codebook Allocation," *Proc. IEEE Int. Conf. Acoust., Speech, Signal Processing*, pp. 10.9.1-10.9.4, San Diego, March 1984.
72. A. Gersho, T. Ramstad, and I. Versvik, "Fully Vector-Quantized Subband Coding with Adaptive Codebook Allocation," *Proc. IEEE Int. Conf. Acoust., Speech, Signal Processing*, pp. 10.7.1-10.7.4, San Diego, March 1984.
73. D. Y. Cheng, A. Gersho, B. Ramamurthi, and Y. Shoham, "Fast Search Algorithms for Vector Quantization and Pattern Matching," *Proc. IEEE Int. Conf. Acoust., Speech, Signal Processing*, pp. 911.1-911.4, San Diego, March 1984.
74. B. Ramamurthi and A. Gersho, "Image Vector Quantization with a Perceptually-Based Cell Classifier," *Proc. IEEE Int. Conf. Acoust., Speech, Signal Processing*, pp. 32.10.1-32.10.4, San Diego, March 1984.
75. B. Ramamurthi and A. Gersho, "Edge-Oriented Spatial Filtering of Images with Application to Post-Processing of Vector-Quantized Images," *Proc. IEEE Int. Conf. Acoust., Speech, Signal Processing*, pp. 48.10.1-48.10.4, San Diego, March 1984.
76. A. Gersho and E. Biglieri, "Adaptive Cancellation of Channel Nonlinearities for Data Transmission," *Conf. Rec., 1984 IEEE Inter. Conf. on Commun.*, Amsterdam, May 1984, pp. 1239-1242.
77. A. Gersho and Victor Lawrence, "Multidimensional Signal Design for Voiceband Data Transmission," *Conf. Rec., 1984 IEEE Int. Conf. on Commun.*, Amsterdam, May 1984, pp. 377-380.
78. Y. Shoham and A. Gersho, "Pitch Synchronous Transform Coding of Speech at 9.6 Kb/s Based on Vector Quantization," *Conf. Rec., 1984 IEEE Int. Conf. on Commun.*, pp. 1179-1182, Amsterdam, May 1984.
79. A. Gersho and R. Steele, "Encryption of Analog Signals: A Perspective," *IEEE Trans. on Selected Areas in Commun.*, pp. 423-425, May 1984.

80. A. Gersho, "Perfect Secrecy Encryption of Analog Signals," IEEE Trans. on Selected Areas in Commun., pp. 460-466, May 1984.
81. A. Gersho, "Reduced Complexity Implementation of Passband Adaptive Equalizers," (Special Issue on Voiceband Data Commun.) IEEE Trans. on Selected Areas in Commun., vol. SAC-2, pp. 778-779, September 1984.
82. A. Gersho and V. Lawrence, "Multidimensional Signal Constellations for Voiceband Data Transmission," IEEE Journal on Selected Areas in Commun., (Special Issue on Voiceband Data Commun.) vol. SAC-2, pp. 687-702, September 1984.
83. E. Biglieri, A. Gersho, R.D. Gitlin, T. Lim, "Adaptive Cancellation of Nonlinear Intersymbol Interference for Voiceband Data Transmission," IEEE Journal on Selected Areas in Commun., (Special Issue on Voiceband Data Commun.) vol. SAC-2, pp. 765-777, September 1984.

1985

84. M. Yano and A. Gersho, "Adaptive Vector Quantization of Images by Progressive Codevector Replacement," Proc. IEEE Int. Conf. Acoust., Speech, Signal Processing, pp. 4.6.1-4.6.4, Tampa, March 1985.
85. G. Davidson, R. Aravind, T. Stanhope, and A. Gersho, "Real-Time Speech Compression with a VLSI Vector Quantization Processor," Proc. IEEE Int. Conf. Acoust., Speech, Signal Proc., pp. 37.6.1-37.6.4, Tampa, March 1985.
86. Y. Shoham and A. Gersho, "Efficient Codebook Allocation for an Arbitrary Set of Vector Quantizers" Proc. IEEE Int. Conf. Acoust., Speech, Signal Processing, pp. 43.7.1-43.7.4, Tampa, March 1985.
87. A. Gersho, "Adaptive Quantization," Proc. Seminar on Quantization and Adaptivity, pp. 41-49, Nice, France, May 1985.
88. J. H. Chen and A. Gersho, "Gain-Adaptive Vector Quantization for Medium-Rate Speech Coding," Conf. Rec., IEEE Int. Conf. on Commun., pp. 1456-1460, Chicago, June 1985.
89. V. Cuperman and A. Gersho, "Vector Predictive Coding of Speech at 16 Kb/s," IEEE Trans. on Commun., vol. COM-33, pp. 685-696, July 1985.
90. A. Gersho, "Vector Quantization: A New Direction in Source Coding," in Digital Commun., E. Biglieri and G. Prati, editors, Elsevier Science Publishers (North-Holland), 1986, pp. 267-281.
91. A. Gersho, "Principles of Quantization," in Quantization, P. Swaszek, editor, Van Nostrand Reinhold Co., pp. 7-13, New York, 1985. (reprint of 1978 paper)
92. A. Gersho, "Asymptotically Optimal Block Quantization," in Quantization, P. Swaszek, editor, Van Nostrand Reinhold Co., pp. 113-120, New York, 1985. (reprint of 1979 paper)

1986

93. Grant Davidson and A. Gersho, "Application of a VLSI Vector Quantization Processor to Real-Time Speech Coding," IEEE Journal on Selected Areas in Commun., vol. SAC-4, No. 1, pp. 112-124, January, 1986.
94. H. Koyama and A. Gersho, "A New Technique for Multipulse Excited LPC Speech Coding Using Vector Quantization," Proc. IEEE Phoenix Conf. on Computers and Commun., March, 1986.

- **95. Juin-Hwey Chen and A. Gersho, "Vector Adaptive Predictive Coding of Speech at 9.6 kb/s" Proc. IEEE Int. Conf. Acoust., Speech, Signal Processing, vol. 3, pp.
- 96. P. Cappello, G. Davidson, A. Gersho, C. Koc, and V. Somayazulu, "A Systolic Vector Quantization Processor for Real-Time Speech Coding," Proc. IEEE Int. Conf. Acoust., Speech, Signal Proc., vol. 3, pp. 2143-2146, Tokyo, April 8-11, 1986.
- 97. G. Davidson and A. Gersho, "Complexity Reduction Methods for Vector Excitation Coding," Proc. IEEE Int. Conf. Acoust., Speech, Signal Proc., vol. 4, pp. 3055-3058, Tokyo, April 8-11, 1986.
- 98. De-Yuan Cheng and A. Gersho, "A Fast Codebook Search Algorithm for Nearest-Neighbor Pattern Matching," Proc. IEEE Int. Conf. Acoust., Speech, Signal Processing, vol. 1, pp. 265-268, Tokyo, April 8-11, 1986.
- 99. R. Aravind and A. Gersho, "Low-Rate Image Coding with Finite-State Vector Quantization," Proc. IEEE Int. Conf. Acoust., Speech, Signal Processing, vol. 1, pp. 137-140, Tokyo, April 8-11, 1986.
- 100. Hitoshi Koyama and A. Gersho, "Fully Vector-Quantized Multipulse LPC at 4800 BPS," Proc. IEEE Int. Conf. Acoust., Speech, Signal Processing, vol. 1, pp. 445-448, Tokyo, April 8-11, 1986.
- 101. R. Aravind and A. Gersho, "Image Coding Below 0.5 Bits Per Pixel Using Vector Quantization," Proc. 1986 European Signal Processing Conf., (EUSIPCO 86), pp. 757-760, Amsterdam, September 1986.
- 102. A. Gersho, "Adaptive Vector Quantization," Annales des Telecommunications, vol. 41, no. 9-10, September-October 1986, pp. 470-480.
- 103. B. Ramamurthi and A. Gersho, "Nonlinear Space-Variant Post-Processing of Block Coded Images," IEEE Trans. Acoust., Speech, Signal Processing, vol. ASSP-34, No. 5, pp. 1258-1268, October 1986.
- 104. S. A. Townes, A. Gersho, T. P. Barnwell, III, R.C. R, G. D. Davidson, and J. H. Chen "4800 b/s Speech Compression Techniques for Mobile Satellite Systems," Proceedings 1986 IEEE Military Commun. Conf., pp. 32.6.1-32.6.5, October 5-9, 1986, Monterey, California.
- 105. B. Ramamurthi and A. Gersho, "Classified Vector Quantization of Images," IEEE Trans. on Commun., vol. COM-34, no. 11, pp. 1105-1115, November, 1986.

1987

- 106. R. Aravind and A. Gersho "Image Compression Based on Vector Quantization with Finite Memory (invited paper), Optical Engineering, vol. 26, No. 7, pp. 570-580 July, 1987.
- 107. J. H. Chen, G. Davidson, A. Gersho, and K. Zeger "Speech Coding for the Mobile Satellite Experiment," (invited paper), special session on Mobile Satellite Commun., Proceedings IEEE Inter. Conf. on Commun., pp 0756-0763, June 1987.
- 108. Kenneth Zeger and A. Gersho, "Real-Time Vector Predictive Coding of Speech," Proceedings IEEE Inter. Conf. on Commun., pp 1147-1152, June 1987.
- 109. Juin-Hwey Chen and A. Gersho "Covariance and Autocorrelation Methods for Vector Linear Prediction" Proc. IEEE Int. Conf. Acoust., Speech, Signal Proc., pp. 1545-1548, April 1987.
- 110. Juin-Hwey Chen and A. Gersho "Real-Time Vector APC Speech Coding at 4800 bps with Adaptive Postfiltering" Proc. Int. Conf. on Acoust., Speech, Signal Processing, pp. 2185-2188, April 1987.

111. Grant Davidson, Mei Yong, and A. Gersho "Real-Time Vector Excitation Coding of Speech at 4800 BPS" Proc. Int. Conf. on Acoust., Speech, Signal Processing, pp. 2189-2192, April 1987.
112. D. Jacques Vaisey and A. Gersho, "Variable Block Size Image Coding" Proc. Int. Conf. Acoust., Speech, Signal Processing, pp.1051-1054, April 1987.
113. Juin-Hwey Chen and A. Gersho, "Gain-Adaptive Vector Quantization with Application to Speech Coding," IEEE Trans. on Commun., COM-35, no.9, pp. 918-930, September, 1987.
114. A. Gersho, "Adaptive Equalization of Highly Dispersive Channels for Data Transmission," (reprint of 1969 paper) in Leon H. Sibul, editor, Adaptive Signal Processing, IEEE Press, New York, 1987, pp. 81-88.
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116. Kenneth Zeger and A. Gersho "Zero-Redundancy Channel Coding in Vector Quantisation," Electronics Letters, Vol. 23, No. 12, pp. 654-656, June 4, 1987.
117. W.Y. Chan, J.H. Chen, G. Davidson, and A. Gersho, "A Prototype 4800 bps Voice Terminal for NASA's Mobile Satellite Experiment," Conf. Record, IEEE Global Telecomm. Conf., Tokyo, Japan, November 1987, pp. 1135-1139.

1988

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119. Grant Davidson and A. Gersho, "Multiple-Stage Vector Excitation Coding of Speech Waveforms," Proc. IEEE Int.Conf. Acoust., Speech, Signal Processing, New York, April 1988, pp. 163-166.
120. Mei Yong, Grant Davidson and A. Gersho, "Encoding of LPC Spectral Parameters Using Switched-Adaptive Interframe Vector Prediction," Proc. IEEE Int. Conf. Acoust., Speech, Signal Processing, New York, April 1988, pp. 402-405.
121. D. Chase and A. Gersho, "Real-Time VQ Codebook Generation Hardware for Speech Processing," Proc. IEEE Int. Conf. Acoust., Speech, Signal Processing, New York, April 1988, pp. 1730-1733.
122. Jacques Vaisey and A. Gersho, "Simulated Annealing and Codebook Design," Proc. IEEE Int. Conf. Acoust., Speech, Signal Processing, New York, April 1988, pp. 1176-1179.
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