Andrew C. Singer

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CURRENT ACADEMIC POSITIONS

Professor in the Department of Electrical and Computer Engineering,
Professor in the Coordinated Science Laboratory,
Director, Technology Entrepreneur Center, College of Engineering,
University of Illinois at Urbana Champaign

ADDRESS 110 Coordinated Science Laboratory, 1308 W. Main St., Urbana, IL, 61801.
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PROFESSIONAL INTERESTS

Research and teaching in electrical and computer engineering, innovation and entrepreneurship. Research interests include signal processing and communication systems, adaptive decision making, and financial modeling.

EDUCATION

June 1996 **Massachusetts Institute of Technology**, Cambridge, MA
Ph.D. degree in Electrical Engineering and Computer Science

Feb. 1992 **Massachusetts Institute of Technology**, Cambridge, MA
S.M. degree in Electrical Engineering and Computer Science

Feb. 1990 **Massachusetts Institute of Technology**, Cambridge, MA
S.B. degree in Electrical Engineering and Computer Science

AWARDS/HONORS

2012 Invited to join inaugural Curation Board of the National Center for Engineering Pathways to Innovation (Epicenter), an initiative funded by the National Science Foundation.

2010 Invited to serve as a Franklin Fellow at the U.S. Department of State.

2009 Elected to the grade of Fellow in the Institute of Electrical and Electronics Engineers (IEEE), "for contributions to signal processing techniques for digital communication."

2009 Pride of CASE V Gold Award for Best Student Alumni Programming from the Council for Advancement and Support of Education District V for the Technology Entrepreneur Center's Silicon Valley Alumni Workshop.

2009 Special-Topic Evening Session Award, for the talk entitled, "Trends and Challenges in Optical Communications Front-End," International Solid State Circuits Conference.

2008 Best Paper Award for the IEEE Signal Processing Magazine for the paper entitled "Turbo Equalization" which appeared in the January 2004 issue.

2008 Selected for participation in National Academy of Engineering, "Frontiers of Engineering" symposium.

2007 Invited keynote, Texas Instruments Developers Conference, 2007.

2007 Invited keynote, National Instruments, NI WEEK, 2007.

2006 Best Paper Award for the IEEE Journal of Solid State Circuits for the paper entitled "An MLSE Receiver for Electronic Dispersion Compensation of OC-192 Fiber Links."

2002-2009 Donald Biggar Willet Faculty Scholar, College of Engineering, University of Illinois at Urbana-Champaign.

2000 Xerox Award for Outstanding Faculty Research, College of Engineering, University of Illinois at Urbana-Champaign.

2000 National Science Foundation CAREER Award.

2000 Office of Naval Research Special Research Award in Ocean Acoustics.

2000,2001 Incomplete List of Teachers Ranked Excellent by their Students, University of Illinois at Urbana-Champaign, Spring 2000, Fall 2000, Fall 2001.

1998 Lockheed Martin Special Recognition Award.

APPOINTMENTS AND RELATED EXPERIENCE

12/08 – Pres. **Dx Photonics,** Champaign, IL. Member of Board of Directors.

12/07 – Pres. **Mimosa Acoustics,** Champaign, IL. Member of Board of Directors.

02/10 – Pres. **Innovate @ Illinois,** Champaign, IL. Host of monthly television program showcasing entrepreneurship and innovation in the University of Illinois Community.

06/05 – Pres. **University of Illinois at Urbana-Champaign**, Urbana, IL
Director, Technology Entrepreneur Center, College of Engineering. Oversee activities in the College of Engineering relating to innovation and entrepreneurship, including curricula for undergraduate and graduate certificate programs, distance learning programs for entrepreneurship and innovation, Innovation Living Learning Community, the Lemelson-MIT Illinois Student Prize, the V. Dale Cozad New Venture Competition, Illini-TEC Forums in Chicago, Silicon Valley and Chicago Student Trips, and the annual NCIIA Invention to Venture Workshops, among a host of other on-campus student and faculty-oriented activities.

08/08 – Pres. **University of Illinois at Urbana-Champaign**, Urbana, IL
Professor in the Electrical and Computer Engineering Department and the Coordinated Science Laboratory. Research sponsors include the Office of Naval Research, the National Science Foundation, Defense Advanced Research Projects Agency, and industry. Network Connectivity theme leader across the five centers of the Microelectronics Advanced Research Corporation (MARCO) Focus Center Research Program. Co-PI for ONR Multi-University Research Initiative on Underwater Acoustic Communications.

02/09 – Pres. **Champaign Signal Processing**, Champaign, IL
Consultant and expert witness for communications, signal processing and integrated

circuit industries. Testified in U.S. Federal District Court as well as before the United States International Trade Commission.

3/07 - 2/09 **Finisar Corporation,** Champaign, IL
Sr. Scientist in Optical Products Division (upon acquisition of Intersymbol Communications, Inc., 3/2007). Research and development in new product areas and Director of the Intersymbol Communications division.

8/00 - 3/07 **Intersymbol Communications, Inc.**, Champaign, IL
Co-Founder and Chief Executive Officer. Co-founded and raised over $10M for a Venture Capital-backed integrated circuit (IC) company creating signal processing-enhanced optical communications ICs. Designed and built the world's first 10Gb/s adaptive MLSE-based receivers for electronic dispersion compensation in high-speed optical communications. Intersymbol was acquired by Kodeos Communications in March, 2006 and by Finisar Corporation (NASDAQ:FNSR) in March, 2007.

8/03 – 8/08 **University of Illinois at Urbana-Champaign**, Urbana, IL
Associate Professor in the Electrical and Computer Engineering Department and the Coordinated Science Laboratory.

8/98 - 8/03 **University of Illinois at Urbana-Champaign**, Urbana, IL
Assistant Professor in the Electrical and Computer Engineering Department and the Coordinated Science Laboratory.

9/96 - 8/98 **Sanders, A Lockheed Martin Company** (Now BAE Systems), Nashua NH
Principle investigator under the Army Research Laboratory Program for Advanced Telecommunications. Signal processing lead for ATD-111 Airborne LIDAR mine and submarine detection program. Research areas include underwater acoustic and wireless RF communications; detection systems; real-time algorithm development and implementation, and multi-sensor data fusion. Customers include the US Army, Navy and other agencies in the Department of Defense.

5/96-9/96 **Research Laboratory of Electronics, MIT**, Cambridge, MA
Postdoctoral Affiliate in the Digital Signal Processing Group

BOOKS AND BOOK SECTIONS

N. Shanbhag, A. C. Singer, and H-M Bae, "Signal Processing for High Speed Links," Section for Chapter on "Applications," *Handbook of Signal Processing Systems,* Edited by S.S. Bhattacharyya, E.F. Deprettere, R. Leupers, and J. Takala, Springer, 2010.

J. Buck, M. Daniel, and A. Singer, *Computer Explorations in Signals and Systems Using Matlab*, Prentice Hall *Signal Processing* Series, Prentice Hall, November 1996. Second Edition 2001. Over 15,000 copies sold.

A.C. Singer, "Solitons," Section for Chapter on "Nonlinear Signals and Systems," *The DSP Handbook*, Edited by V. Madisetti and D. Williams, CRC Press, *1997.*

PEER REVIEWED JOURNAL PUBLICATIONS

1. A.C. Singer, G.W. Wornell, and A.V. Oppenheim, "Nonlinear Autoregressive Modeling and Estimation in the Presence of Noise," *Digital Signal Processing*, vol. 4, no. 4, pp. 207-221, October 1994.
2. A.C. Singer and A.V. Oppenheim, "Circuit Implementations of Soliton Systems," *International Journal of Bifurcation and Chaos*, vol. 9, no. 4, pp. 571-590, April 1999.
3. A.C. Singer, A.V. Oppenheim, and G.W. Wornell, "Detection and Estimation of Multiplexed Soliton Signals," *IEEE Transactions on Signal Processing*, vol. 47, no. 10, pp. 2768-2782, October 1999.
4. A.C. Singer and M. Feder, "Universal Linear Prediction by Model Order Weighting," *IEEE Transactions on Signal Processing*, vol. 47, no. 10, pp. 2685-2699, October 1999.
5. D. Baron and A. C. Singer, "On the Cost of Worst-Case Coding Constraints" *IEEE Trans. Information Theory*, vol. 47, pp. 3088-3090, November 2001.
6. M. J. Lopez, and A. C. Singer, "A DFE Coefficient Placement Algorithm for Digital Communications," *IEEE Transactions on Communications*, vol. 49, no. 8, pp. 1334 -1338, Aug. 2001.
7. M. Tuechler, R. Koetter, and A.C. Singer, "Turbo Equalization: Principles and New Results", *IEEE Transactions on Communications*, vol. 50, no. 5, pp.754-767, May 2002.
8. M. Tuechler, A.C. Singer, and R. Koetter, "Minimum Mean Square Error Equalization with Priors," *IEEE Transactions on Signal Processing*, vol. 50 no. 3, pp. 673 -683, March 2002.
9. N. Cadalli, D. C. Munson, and A.C. Singer, "Bistatic Receiver Model for Airborne Lidar Returns Incident on an Imaging Array From Underwater Objects" *Applied Optics*, vol. 41, no. 18, pp. 3638-3649, June 2002.
10. A.C. Singer, S.S. Kozat, and M. Feder, "Universal linear least squares prediction: upper and lower bounds," *IEEE Transactions on Information Theory*, vol. 48, no. 8, pp. 2354-2362, August, 2002.
11. J. Nelson, A.C. Singer, and R. Koetter, "Linear Iterative Turbo Equalization (LITE) for Dual Channels," *IEEE Transactions on Communications*, pp. 860-864, June 2003.
12. Y. Jiang, R. Koetter, and A.C. Singer, "On the Separability of Demodulation and Decoding for Communications over Multiple-Antenna Block Fading Channels," *IEEE Transactions on Information Theory*, vol. 49, no. 10, pp. 2709-2713, October 2003.
13. M. Tuechler, R. Koetter, and A.C. Singer, "Graphical models for coded data transmission over intersymbol interference channels," European Transactions on Telecommunications, v. 15, n. 4, July/August, 2004, *Selected Papers from the 5th International ITG Conference on Source and Channel Coding*, pp. 307-321
14. S. Song, A.C. Singer, and K.-M. Sung, "Soft input channel estimation for turbo equalization," *IEEE Transactions on Signal Processing*, vol. 52, no. 10 , Oct. 2004 pp. 2885 – 2894.

15. R. Koetter, A.C. Singer, and M. Tuechler, "Turbo Equalization," *IEEE Signal Processing Magazine*, invited paper, *Special Issue on Graphical Models*, vol. 21, no. 1, Jan. 2004, pp. 67 – 80.
16. Feder, M.; Figueiredo, M.A.T.; Hero, A.O.; Lee, C.-H.; Loeliger, H.-A.; Nowak, R.; Singer, A.C.; Yu, B.; Guest Editorial: Special Issue on Machine Learning Methods in Signal Processing; *IEEE Transactions on Signal Processing*, vol. 52, no. 8, Aug. 2004, pp. 2152 – 2152.
17. R.J. Drost and A.C. Singer, "Factor graph methods for three-dimensional shape reconstruction as applied to LIDAR imaging" *Journal of the Optical Society of America A (Optics, Image Science and Vision)*, vol. 21, no. 10, Oct. 2004, pp. 1855-68.
18. S.-J. Lee, N. R. Shanbhag and A.C. Singer, "Energy-efficient VLSI architecture for linear turbo equalizer," *Journal of VLSI Signal Processing Systems for Signal, Image, and Video Technology*, vol. 39, no. 1-2 SPEC.ISS., January/February, 2005, pp. 49-62.
19. S.-J. Lee, N.R. Shanbhag, and A.C. Singer, "A 285-MHz MAP Decoder in 0.18μm CMOS," *IEEE Journal of Solid-State Circuits*, vol. 40, no. 8, Aug. 2005, pp. 1718 - 1725.
20. S.-J. Lee, A.C. Singer, and N. R. Shanbhag, "Linear Turbo Equalization Analysis via Linearized BER Transfer and EXIT Charts," *IEEE Transactions on Signal Processing*, vol. 53, no. 8, Part 1, Aug. 2005. pp. 2883 - 2897.
21. J.K. Nelson, A.C. Singer, U. Madhow, and C. Mc Gahey, "BAD:Bidirectional Arbitrated Decision Feedback Equalization", *IEEE Transactions on Communications*, vol. 53, no. 2, February, 2005, p 214-218.
22. S.-J. Lee, N.R. Shanbhag, and A.C. Singer, "Area-Efficient, High-Throughput MAP Decoder Architectures," *IEEE Transactions on Very Large Scale Integration (VLSI) Systems*, vol. 13, no. 8, Aug. 2005, p 921-33.
23. C.J. Lam and A.C. Singer, "Bayesian Beamforming for DOA Uncertainty: Theory and Implementation", *IEEE Transactions on Signal Processing*, vol. 54, no. 11, Nov. 2006 pp. 4435 - 4445
24. H. M. Bae, J. Ashbrook, J. Park, N. Shanbhag, A.C. Singer, and S. Chopra, "An MLSE receiver for electronic-dispersion compensation of OC-192 links," *Journal of Solid-State Circuits Conference, Journal of Solid State Circuits*, vol. 41, no. 11, Nov. 2006, pp. 2541 - 2554
25. J.W. Choi, B. Shim, A.C. Singer, and N.I. Cho, "Low-Power filtering via minimum power soft error cancellation (MP-SEC)," *IEEE Transactions on Signal Processing*, vol. 55, no. 10, Oct. 2007 pp. 5084 – 5096.
26. R. Drost, A.C. Singer, "Factor Graph Algorithms for Equalization," *IEEE Transactions on Signal Processing*, vol. 55, no. 5, Part 2, May 2007, pp. 2052 - 2065
27. A. Sen Gupta, A.C. Singer, "Successive Interference Cancellation using Constellation Structure," *IEEE Transactions on Signal Processing*, vol. 55, no. 12, Dec. 2007 pp. 5716 – 5730.

28. S. S. Kozat and A.C. Singer, "Universal Piecewise Linear Prediction via Context Trees," *IEEE Transactions on Signal Processing*, July, 2007, vol. 55(7), Part 2, pp. 3730-3745 .
29. S.S. Song and A.C. Singer, "Blind OFDM Channel Estimation Using FIR Constraints: Reduced Complexity and Identifiability" *IEEE Transactions on Information Theory*, vol. 53, no. 3, March 2007, pp. 1136 - 1147
30. S.S. Song and A.C. Singer, "Pilot-Aided OFDM Channel Estimation in the Presence of the Guard Band," *IEEE Transactions on Communications*, vol. 55(8), August, 2007, pp. 1459-1465.
31. Y. Jiang, A. Ashikhmin, R. Koetter, A. C. Singer, "Extremal Problems of Information Combining", *IEEE Transactions on Information Theory*, Volume 54, Issue 1, Jan. 2008 pp. 51 - 71.
32. S.S. Kozat and A.C. Singer "Universal Switching Linear Least Squares Prediction," *IEEE Transactions on Signal Processing*, vol. 56, no. 1, Jan. 2008. pp. 189 – 204.
33. H.M. Bae, J. Ashbrook, N.R. Shanbhag, and A.C. Singer "Fast Power Transient Management for OC-192 WDM Add/Drop Networks" *IEEE Journal of Solid-State Circuits*, vol. 43, no. 12, Dec. 2008, pp. 2958 – 2966.
34. K.M. Guan, S.S. Kozat and A.C. Singer "Adaptive reference levels in a level-crossing analog-to-digital converter," *Eurasip Journal on Advances in Signal Processing*, vol. 2008. pp. 1-11.
35. A.C. Singer, N.R. Shanbhag, and H.M. Bae, "Electronic Dispersion Compensation," *IEEE Signal Processing Magazine*, vol. 25, no. 6, Nov. 2008, pp. 110 – 130.
36. A. Sen Gupta and A.C. Singer, "Interference Suppression for Memoryless Nonlinear Multiuser Systems Using Constellation Structure," *IEEE Transactions on Signal Processing*, vol. 56, no. 11, Nov. 2008, pp. 5589 – 5604.
37. A.C. Singer, J.K. Nelson and S.S. Kozat, "Signal Processing for Underwater Acoustic Communications," *IEEE Communications Magazine*, invited, vol. 47, no. 1, Jan. 2009, pp. 90-96.
38. S. Kozat and A.C. Singer "Switching Strategies for Sequential Decision Problems with Multiplicative Loss with Application to Portfolios," *IEEE Transactions on Signal Processing*, vol. 57, no. 6, June 2009, pp. 2192 – 2208.
39. S. Kozat and A.C. Singer, "Competitive Prediction Under Additive Noise," *IEEE Transactions on Signal Processing*, vol. 57, no. 9, Sept. 2009, pp. 3698 – 3703.
40. J.W. Choi, B. Shim, A.C. Singer, and N.I Cho, "Low-Complexity Decoding Via Reduced Dimension Maximum Likelihood Search," *IEEE Transactions on Signal Processing*, vol. 58(3):2 , p.p. 1780 – 1793, 2010.
41. S.S. Kozat, A.T. Erdogan, A.C. Singer and A.H. Sayed, "Steady-State MSE Performance Analysis of Mixture Approaches to Adaptive Filtering," *IEEE Transactions on Signal Processing*, vol. 58, no. 8, August, 2010, pp. 4050-4063.
42. S.S. Kozat and A.C. Singer, "Universal Randomized Switching," *IEEE Transactions on Signal Processing*, vol. 58 , no. 3 , Part: 2, 2010 , pp. 1922 – 1927.

43. J.W. Choi, A.C. Singer, J. Lee, and N.-I. Cho, "Improved linear soft-input soft-output detection via soft feedback interference cancellation," *IEEE Transactions on Communications,* vol. 58, no. 3, 2010 , pp. 986 - 996.
44. S.S. Kozat, A.T. Erdogan, A.C. Singer, and A.H. Sayed, "Unbiased Model Combinations for Adaptive Filtering," *IEEE Transactions on Signal Processing*, vol. 58, no. 8, August, 2010, pp.4421-4427.
45. S.S. Kozat and A.C. Singer, "Universal Semi-constant Rebalanced Portfolios," *Journal of Mathematical Finance,* vol. 21, no. 2, pp. 293-311, 2011.
46. M. Tuechler and A.C. Singer, "Turbo Equalization: An Overview," *IEEE Transactions on Information Theory,* vol. 57, no. 2, pp. 920-952, 2011.
47. J.W. Choi, T.J. Riedl, K. Kim, A.C. Singer, and J.C. Preisig, "Adaptive Linear Turbo Equalization Over Doubly Selective Channels," *IEEE Journal of Oceanic Engineering*, vol. 36, no. 4, pp. 473-489, 2011.
48. R.R. Chen, A. Chockalingam, G. Leus, R. Raheli, A.C. Singer, "Introduction to the Issue on Soft Detection for Wireless Transmission," *IEEE Journal of Selected Topics in Signal Processing,* vol. 5, no. 8, pp. 1397-1399, 2011.
49. A. Sen Gupta, J.K. Nelson, W. Zhou, A.C. Singer, and J.C. Preisig, "A Geometric Approach to Improve Interference Mitigation in Multi-User Detection and Equalization," *IEEE Transactions on Signal Processing,* vol. 59(4), pp. 1694-1705, 2011.
50. H. Wan, R.R. Chen, J.W. Choi, A.C. Singer, J.C. Preisig, B. Farhang-Boroujeny, "Markov Chain Monte Carlo Detection for Frequency-Selective Channels Using List Channel Estimates," *IEEE Journal of Selected Topics in Signal Processing*, vol. 5(8), 2011.
51. S.S. Kozat, A.T. Erdogan, A.C. Singer, A.H. Sayed, "Transient Analysis of Adaptive Affine Combinations," *IEEE Transactions on Signal Processing*, vol. 59, no. 12, pp. 6227 – 6232, 2011.
52. M. Effros, G.D. Forney, Jr., F.R. Kschischang, M. Medard, A.C. Singer, A. Vardy, "The Scientific Legacy of Ralf Koetter," *IEEE Transactions on Information Theory*, vol. 57, no. 2, pp. 589 – 592, 2011.
53. A.J. Bean and A.C. Singer, "Universal Switching and Side Information Portfolios Under Transaction Costs Using Factor Graphs," *IEEE Journal on Selected Topics in Signal Processing*, accepted 2011, to appear 2012.
54. G. Zeitler, G. Kramer, and A.C. Singer, "Bayesian Parameter Estimation Using Single-Bit Dithered Quantization," *IEEE Transactions on Signal Processing*, accepted 2011, to appear 2012.
55. G. Zeitler, A.C. Singer, and G. Kramer, "Low-Precision A/D Conversion for Maximum Information Rate in Channels with Memory," *IEEE Transactions on Communications,* accepted 2011, to appear 2012.

PEER REVIEWED CONFERENCE ARTICLES

1. A.C. Singer, G.W. Wornell, and A.V. Oppenheim, "Codebook Prediction: A Nonlinear Signal Modeling Paradigm," *Proceedings of the International Conference on*

Acoustics, Speech, and Signal Processing, pp. 325-8, vol. 5, San Francisco, CA, March 1992.

2. C. Meyers, A.C. Singer, F. Shin, and E. Church, "Modeling Chaotic Systems with Hidden Markov Models," *Proceedings of the International Conference on Acoustics, Speech, and Signal Processing*, pp. 565-8, vol. 5, San Francisco, CA, March 1992.
3. A.C. Singer, "Signaling Techniques Using Solitons," *Proceedings of the International Conference on Acoustics, Speech, and Signal Processing*, pp. 1336-9, vol. 2, Detroit, MI, May 1995.
4. A.C. Singer, "A New Circuit for Communication Using Solitons," *Proceedings of the IEEE Workshop on Nonlinear Signal and Image Processing*, pp. 150-3, vol. 1, Halkidiki, Greece, June 1995.
5. A.C. Singer, "Detection and Estimation of Soliton Signals," *Proceedings of the International Conference on Acoustics, Speech, and Signal Processing*, pp. 1625-8, vol. 3, Atlanta, GA, May 1996.
6. A.C. Singer, "Lattice Filters for Adaptive Underwater Equalization," *IEEE Underwater Acoustic Signal Processing Workshop*, Kingston, RI, Oct., 1997.
7. R. Learned, A.C. Singer, and G. Wornell, "Iterative Decision Feedback Joint Detection and Decoding for Multiple Access Communications," *Proc. 1998 ARL Conference on Advanced Telecommunications / Information Distribution Research*.
8. A.C. Singer and M. Feder, "Robust Channel Equalization via Universal Adaptive Filtering," *Proc. 1998 ARL Conference on Advanced Telecommunications / Information Distribution Research*.
9. R. Learned and A.C. Singer, "Coding Enhanced Joint Detection for Multiple Access Communications," *Proc. 1998 International Conference on Acoustics, Speech, and Signal Processing*, pp. 3193-6, vol. 6.
10. R. Learned and A.C. Singer, "Iterative Joint Detection and Decoding for Multiple Access Communications Using Feedback," *SPIE-Int. Soc. Opt. Eng. Proceedings of Spie - the International Society for Optical Engineering*, vol. 3393, pp.154-161, 1998.
11. A.C. Singer and M. Feder, "Twice Universal Linear Prediction of Individual Sequences," *Proceedings of 1998 IEEE International Symposium on Information Theory*, p.135, 1998.
12. M. Feder and A.C. Singer, "Universal Data Compression and Linear Prediction," *Proceedings of the 1998 IEEE Data Compression Conference*, pp. 511-520, Snowbird, Utah, 1998.
13. M.J. Lopez, A.C. Singer, S.L. Whitney, and G.S. Edelson, "A DFE Coefficient Placement Algorithm for Underwater Digital Acoustic Communications," *Proceedings of OCEANS '99*, Sept. 13-16, Seattle, WA, 1999.
14. A. Singer, J. Nelson, and R. Koetter, "Linear Iterative Turbo Equalization (LITE) for Dual Channels," *Proc. of the Thirty-third Asilomar Conf. on Signals, Systems, and Computers*, October 24-27, pp. 1670-1674, Monterey, CA, 1999.

15. A.C. Singer and S. Kozat, "On Universal Linear Prediction of Gaussian Data," *Proceedings of the 2000 IEEE Conference on Acoustics, Speech, and Signal Processing*, Istanbul, Turkey, vol. 1, 2000, pp. 13-16.
16. A.C. Singer and S. Kozat, "Multi-Stage Adaptation Algorithms for Filtering Processes of Unknown Order," *Proc. of the First IEEE Sensor Array and Multi-channel Signa*l *Processing Workshop*, March 16-17, Cambridge, MA, 2000, pp. 380-4.
17. R. Koetter, A.C. Singer, and M. Tuechler, "Iterative Correction of Intersymbol Interference via Equalization and Decoding with Priors," *Proceedings of the 2000 International Symposium on Information Theory*, Sorrento Italy, June 25-30, 2000.
18. A.C. Singer and M. Feder, "Universal Linear Least-Squares Prediction," *Proceedings of the Int. Symposium on Information Theory*, Sorrento, Italy, June 25-30, 2000.
19. N. Cadalli, P. Shargo, D. C. Munson, Jr., A.C. Singer, "3-D Tomographic Imaging of Ocean Mines from Real and Simulated LIDAR Returns," *SPIE 46th Annual Meeting: The International Symposium on Optical Science and Technology*, San Diego, CA, June 25-30, 2000.
20. J. Nelson, R. Koetter, and A.C. Singer, "Evolution of Priors in the LITE," *Proc. 4th Conference on Information Sciences and Systems*, Princeton, NJ, March 15-17, 2000.
21. C. McGahey, A.C. Singer and U. Madhow, "BAD: A Bi-directional Arbitrated Decision Feedback Equalizer," *Proc. 34th Conference on Information Sciences and Systems*, Princeton, NJ, March 15-17, 2000.
22. P. Shargo, N. Cadalli, A.C. Singer, D. Munson, "A Tomographic Framework for LIDAR Imaging," *Proc. International Conference on Acoustics, Speech, and Signal Processing*, Salt Lake City, UT, 2001, pp. 1893-1896, vol. 3.
23. N. Cadalli, P. Shargo, D. Munson, A.C. Singer, "3-D Tomographic Imaging of Ocean Mines from Real and Simulated Lidar Returns," *SPIE's 46th Annual Meeting: The International Symposium on Optical Science and Technology*, San Diego, CA, 29 July - 3 August 2001.
24. J.K. Nelson, A.C. Singer, R. Koetter, "Evolution of Prior Information in SISO Equalization" *Proc. 2001 International Symposium on Information Theory*, 2001, p. 74.
25. M. Tuechler, A.C. Singer, and R. Koetter, "Hybrid equalization strategies for iterative equalization and decoding," *Proceedings of the 2001 International Symposium on Information Theory*, 2001.
26. R. Drost, D. Munson, A.C. Singer, "A Shape from Silhouette Approach to Imaging Ocean Mines," *SPIE 46th Annual Meeting: The International Symposium on Optical Science and Technology*, San Diego, CA, 29 July-3 August, 2001, vol. 4488, pp. 115-122.
27. S.S. Kozat and A.C. Singer, "Further Results in Multistage Adaptive Filtering", *Proceedings of ICASSP*, Orlando, FL, vol. 2, 2002, pp. II/1329-II/1332.
28. S. Song, A.C. Singer, and K.-M. Sung, " Turbo equalization with an unknown channel," *Proc. ICASSP 2002*, vol. 3, pp. III.2805-III.2808, 2002.
29. S.S. Kozat and A.C. Singer, "A Lower bound on the Performance of Sequential Prediction", *Proc. IEEE ISIT 2002*, Switzerland, 2002, p. 147.

30. C.J. Lam and A.C. Singer "A Sequential Bayesian Beamformer for Gauss-Markov Signals," *Second IEEE Sensor Array and Multi-channel Signal Processing Workshop*, August 2002, Washington, DC, pp. 28-32.
31. S.-J. Lee, N. R. Shanbhag, and A.C. Singer, "Low-Power Turbo equalizer architecture," in *Proc. of IEEE Signal Processing Systems(SiPS):Design and Implementation*, pp. 33-38, October 2002.
32. Y. Jiang, R. Koetter, and A.C. Singer, "On the Separation of Demodulation and Decoding for Communications over Multiple-Antenna Channel," *Proceedings of IEEE International Symposium on Information Theory*, pp. 92, July 2003.
33. J.K. Nelson, A.C. Singer, and U. Madhow, "Asymptotic efficiency of the BAD algorithm," *Proc. 2003 IEEE Workshop on Statistical Signal Processing*, 2003, p 86-9.
34. S-J. Lee, A.C. Singer, and N. R. Shanbhag, "Analysis of linear Turbo-Equalizer via EXIT chart," *Proceedings of Global Telecommunication Conference*, 2003, pt. 4, pp. 2237-2242 vol. 4.
35. S.-J. Lee, N. R. Shanbhag, and A.C. Singer, "A low-power VLSI architecture for Turbo decoding," *Proceedings of IEEE International Symposium on Low Power Electronics Design (ISLPED'03)*, 2003, pp. 366-371
36. A. Sen Gupta and A.C. Singer, "Linear complexity multi-user detector using joint successive interference cancellation," *Proceedings of Asilomar Conference on Signals, Systems, Computers*, Pacific Grove, CA, November 9-12, 2003. 2003, pt. 1, pp. 157-61 vol. 1.
37. M. Tuechler, R. Koetter, and A.C. Singer, "Graphical models for coded data transmission over intersymbol interference channels," in *Proceedings of the 5th ITG Conference on Source and Channel Coding*, Erlangen, Germany, January 2004.
38. C. J. Lam and A.C. Singer, "Fast Adaptive Bayesian Beamforming using the FFT," *Proceedings of the IEEE Workshop on Statistical Signal Processing*, St Louis, MO, September 2003.
39. R. J. Drost and A.C. Singer, "Image Segmentation Using Factor Graphs," *2003 IEEE Workshop on Statistical Signal Processing*, St. Louis, MO, September 28 - October 1, 2003, pp. 150-153.
40. S.J. Lee and A.C. Singer, "Convergence Analysis of Linear Turbo Equalizer," *Proceedings of the 37th Asilomar Conference on Signals, Systems, and Computers*, November 2003, pt. 1, pp. 667-71, vol.1.
41. S.J. Lee, N.R. Shanbhag, and A.C. Singer,"Area-efficient high-throughput VLSI architecture for MAP-based Turbo equalizer," *Proceedings of IEEE Workshop on Signal Processing Systems*, 2003, pp. 87-92.
42. Y. Jiang, R. Koetter, and A.C. Singer, "On the Gaussian Approximation in the Analysis of Iterative MIMO Processing," *Proceedings of the 37th Asilomar Conference on Signals, Systems and Computers*, November 2003, pt. 1, pp. 1105-1109, vol.1
43. J.K. Nelson and A.C. Singer, "Asymptotic efficiency of a blind maximum likelihood sequence detector" *Proc. Asilomar Conference on Signals, Systems and Computers*, 2003, pp. 1667-1671.

44. A. Sen Gupta and A.C. Singer, " Near-far resistant multi-user detector using energy contours," *Proc. ICASSP 2004*, Montreal, Canada, May 21-24, 2004, pp. IV-993-IV-996.
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PUBLISHED PATENT APPLICATIONS

Hyeon Min Bae, Naresh Shanbhag, Andrew Singer, "A Method and Apparatus of Improved Baseband Phase-Locked Loop," Filed 2007. US Patent Application Number 20,100,067,636 .

UNIVERSITY SERVICE (past 5 years)

Director, Technology Entrepreneur Center, College of Engineering, providing undergraduate and graduate curricula and activities in engineering entrepreneurship and innovation for COE students with over 2000 students enrolled in courses and programs annually.

Organizer and host of annual Lemelson-MIT Illinois Student Prize, Cozad Business Plan Competition, and National Collegiate Inventor and Innovators Alliance "Invention to Venture" workshops, supervise operation of the Student Innovation Incubator and the Innovation Living Learning Community.

External Search Committees: College of Business Dean, IESE Head, IESE Faculty, CSL Finance Manager.

Departmental Committees: Chair, ECE Public Relations, ECE Graduate, ECE Graduate Student Recruitment, ECE Advisory, ECE Fellowship, ECE graduate recruiting.

College Committees: Chair, CBAG Online Education Initiatives Committee, Chair, Center for Innovation and Design

University Committees: Enterprise Works Incubator External Advisory Board, Vice President for Technology and Economic Development Advisory Board, Co-Chair University Committee on Entrepreneurship, Engineering College Course evaluation, Senator, Faculty Senate, Participant, Chancellor's Visioning Excellence Retreat, Facilitator, Chancellor's Visioning Excellence Campus-wide Workshops, Co-Chair Campus Roundtable on Entrepreneurship.

PROFESSIONAL SOCIETY SERVICE

IEEE Signal Processing Society Liaison to *Computing in Science and Engineering.*

Inaugural Curation Board Member of the National Center for Engineering Pathways to Innovation (Epicenter), an initiative funded by the National Science Foundation.

Invited participant on National Science Foundation review panels for Information Technology Research, Signal Processing, Mathematical Foundations, Career Award, and Computer Communications Research.

Invited reviewer for science funding agencies from the United States, Canada, Israel, Switzerland and the European Union.

Invited annual reviewer for the National Collegiate Inventor and Innovators Alliance proposals.

Invited member, Global Venture Laboratory.

Invited external reviewer of graduate thesis research and served as Doctoral dissertation outside international expert for theses in Norway on Underwater Acoustic Communications and Turbo Equalization (Norwegian University of Science and Technology, Trondheim), Germany on Turbo Equalization (Technical University of Munich) and Information-Theoretic Quantization and Analog/Digital Conversion (Technical University of Munich), Israel on Generalized Sampling Theory (Tel Aviv University) and Switzerland on Digital Estimation (ETH).

MIT Educational Council Member, 1994-present.

Associate Editor, *IEEE Transactions on Signal Processing* (2 terms), Guest Editor-In-Chief, *IEEE Transactions on Signal Processing -- Special Issue on Machine Learning Methods in Signal Processing*, Guest Associate Editor *IEEE Transactions on Information Theory – Special Issue on Facets of Coding Theory: From Algorithms to Networks,* 2010. Guest Editor-In-Chief, *IEEE Journal on Special Topics in Signal Processing – Special Issue on Special Issue on Soft Detection for Wireless Transmission, 2011.*

Program committee for *IEEE DSP Workshop*, annually 2004-2012, *IEEE Statistical Signal Processing Workshop*, annually 2003-2012, *IEEE International Conference on Acoustic Speech and Signal Processing,* annually 2003-2012, *IEEE International Symposium on Information Theory*, 2008, 2011, 2012.

Member of IEEE Signal Processing Society, IEEE Communications Society, IEEE Information Theory Society, IEEE Oceanic Engineering Society.

Conference organizing committee and Publicity Chair, *IEEE International Symposium on Information Theory,* 2004, Technical Co-Chair *Allerton Conference on Communications, Computing, and Control*, 2005, General Co-Chair, *Allerton Conference on Communications, Computing, and Control*, 2006, Publicity Chair, *IEEE International Conference on Acoustics Speech and Signal Processing*, 2008.

Member of the Signal Processing Theory and Methods (SPTM) technical committee of the IEEE Signal Processing Society, 2004-2011, and the IEEE Machine Learning for Signal Processing technical committee of the IEEE Signal Processing Society, 2007-2012.

Regularly review articles for *IEEE Transactions on Signal Processing, IEEE Signal Processing Letters, IEEE Journal on Special Topics in Signal Processing, IEEE Transactions on Information Theory*, *IEEE Transactions on Circuits and Systems*, *IEEE Transactions on Communications, IEEE Journal of Oceanic Engineering, Acoustical Society of America, Eurasip Journal on Signal Processing, Journal of Applied Optics, Journal of the Optical Society of America, Physica D, SIAM, and others.*

BACKGROUND AND OTHER INTERESTS

United States citizen. Married. Enjoy swimming, biking, running, triathlon, ultra-distance events (ironman, marathon, ultra-marathon) and trail running.