

# Andrew C. Singer

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## CURRENT ACADEMIC POSITIONS

Fox Family Professor  
Interim Director, Siebel Center for Design  
Director, Technology Entrepreneur Center and Special Advisor to the Dean  
for Innovation and Entrepreneurship, College of Engineering  
Professor, Department of Electrical and Computer Engineering,  
Department of Industrial and Enterprise Systems Engineering,  
Department of Business Administration, College of Business  
Interim Innovation Thread Lead, Carle-Illinois College of Medicine  
University of Illinois at Urbana Champaign

ADDRESS 110 Coordinated Science Laboratory, 1308 W. Main St., Urbana, IL, 61801.  
Tel: (217) 244-9263. Email: [acsinger@illinois.edu](mailto:acsinger@illinois.edu) <http://www.illinois.edu/~acsinger>

## PROFESSIONAL INTERESTS

Research and teaching in electrical and computer engineering, and engineering entrepreneurship. Research interests include adaptive and statistical signal processing, communication systems, and machine learning.

## 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

2016 Technical University of Munich Institute for Advanced Study Fellow  
2014 Invested as Fox Family Endowed Professor, for “scholarship and teaching focus on economic development, entrepreneurship, and transfer of technology locally, in the state, and in the nation.”  
2014 Selected as a Distinguished Lecturer for the Signal Processing Society of the Institute of Electrical and Electronics Engineers (IEEE).  
2013 Entrepreneur Advocacy Award, Champaign County Innovation Celebration.  
2012 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, “for contributions to signal processing techniques for digital communication.”  
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.
- 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

##### 4/07-Present **Consultant and Expert Witness**

Recent cases include: Fujitsu Network Communications, Inc. v. **Tellabs, Inc.**, No. 1:09-cv-4530 (Filed 7/27/2009 in the Northern District of Illinois); **Tellabs, Inc.** v. Fujitsu Network Communications, Inc., No. 08-CV-3379 (Filed 6/11/2008 in the Northern District of Illinois); In re Certain Semiconductor Chips and Products Containing Same, ITC Inv. No. 337-TA-753, on behalf of **Rambus** (Filed 12/1/2010 at the International Trade Commission); **Hill-Rom, Inc.** v. Stryker Corp., No. 1:11-CV-01120-JMS-DKL (Filed 8/15/2011 in the Southern District of Indiana); Mobile Telecommunications Technologies, LLC v. **Clearwire Corporation, Clearwire Wireless, LLC, and Clearwire US, LLC**, No. 2:12-CV-308 (Filed 5/24/2012 in the Eastern District of Texas); Mobile Telecommunications Technologies, LLC v. **Sprint Nextel Corp.**, No. 2:12-cv-832-JRG-RSP (Filed 12/31/2012 in the Eastern District of Texas); Inter Partes Reexamination of: U.S. Patent No. 7,568,246, No. 95/002,051, on behalf of **Hill-Rom** (Filed 7/20/2012 at the PTAB); Spherix Inc. v. **Cisco Systems, Inc.**, No. 1:14-cv-393-SLR (Filed 3/28/2014 in the District of Delaware); Inter Partes Review of U.S. Patent No. 6,744,375, No. IPR2014-01379, on behalf of **Garmin International** (Filed 8/25/2014 at the PTAB); Cellular Communications Equipment LLC v. **LG Electronics, Inc., et al.**, No. 6:14-CV-00982-JRG (Filed 12/19/2014 in the Eastern District of Texas); Core Wireless Licensing S.a.r.l. v. **Apple Inc.**, Nos. 3:15-cv-5007-RS and 5:15-cv-5008-PSG (Filed 9/10/14 in the Northern District of California); In re Certain Audio Processing Hardware and Software and Products Containing the Same, ITC Inv. No. 337-TA-949, on behalf of **Conexant** (Filed 2/9/2015 at the International Trade Commission); Cellular Communications Equipment LLC v. **AT&T Inc., et al.**, No. 2:15-cv-0576 (Filed 4/30/2015 in the Eastern District of Texas); Certain Audio Processing Hardware, Software, and Products Containing the Same, ITC Inv. No. 337-TA-1026, on behalf of **Samsung** (Filed 9/19/2016 at the International Trade Commission); Andrea Electronics Corp. v. **Samsung Electronics America, Inc. et al.**, No. 2:16-cv-05217-JMA (Filed 9/19/2016 in the Eastern District of New York); TC Technology LLC v. **Sprint Corp. & Sprint Spectrum L.P.**, No. 1:16-cv-153-RGA (Filed 3/10/2016 in the District of Delaware); Quanergy Systems, Inc. v. **Velodyne LiDAR, Inc.**, No. 5:16-cv-05251-EJD (Filed 9/13/2016 in the Northern District of California)

- 12/16 – Pres. **LISNR, Inc.** Technical advisor for acoustic communications.
- 11/14 – Pres. **OceanComm, Incorporated**, Champaign, IL. Co-Founder and Chief Executive Officer. SBIR-and ONR-funded technology company commercializing underwater acoustic wireless communication technology.
- 12/08 – Pres. **Diagnostic Photonics**, Chicago, IL. Member of Board of Directors.
- 12/07 – 12/15 **Mimosa Acoustics**, Champaign, IL. Member of Board of Directors.
- 02/10 – 6/12 **Innovate @ Illinois**, Champaign, IL. Host of monthly television program showcasing entrepreneurship and innovation in the University of Illinois Community.
- 8/13 – Pres. **University of Illinois at Urbana-Champaign**, Urbana, IL  
Fox Family Professor with primary academic appointment as Professor in the Electrical and Computer Engineering Department. Research sponsors include the Office of Naval Research, the National Science Foundation, Department of Energy, Defense Advanced Research Projects Agency, and commercial industry. Assistant Director and Stochastic Information Processing Systems theme-lead for the Systems on Nanoscale Information fabriCs (SONIC) Center, one of six STARNET centers funded by DARPA and SRC. Director, Signal Processing and Communication Systems Laboratory.
- 06/05 – Pres. **University of Illinois at Urbana-Champaign**, Urbana, IL  
Interim Director, Siebel Center for Design; Director, Technology Entrepreneur Center; Unit Head, Innovation, Leadership, and Engineering Entrepreneurship; Special Advisor to the Dean for Innovation and Entrepreneurship, College of Engineering; Championed the creation of and oversee all activities in the College of Engineering relating to the new bachelor's degree in Innovation, Leadership, and Engineering Entrepreneurship (ILEE), and all curricula for undergraduate and graduate and distance learning programs for entrepreneurship and innovation. Oversee the Faculty Entrepreneurial Fellows Program, as well as the activities of the Innovation Living Learning Community, the Illinois Innovation Prize, the V. Dale Cozad New Venture Competition, Silicon Valley and Chicago Student Trips, among a host of other on-campus student and faculty-oriented activities. Co-chair for the Campus Roundtable on Entrepreneurship. Chair of the Provost's Core Committee for the creation of the Siebel Center for Design. Interim Innovation Thread Lead, Carle-Illinois College of Medicine.
- 8/08 – 8/13 **University of Illinois at Urbana-Champaign**, Urbana, IL  
Professor in the Electrical and Computer Engineering Department and the Coordinated Science Laboratory. 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.
- 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. Air-acoustic and underwater acoustic adaptive beamforming and automatic target detection and classification systems.
- 5/96-9/96 **Research Laboratory of Electronics (RLE), MIT**, Cambridge, MA  
Postdoctoral Affiliate in the Digital Signal Processing Group at RLE.

#### 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 17,000 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 0.18 $\mu$ m 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, pp. 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*, Volume 6, No. 4, pp. 351- 365, August 2012.
54. G. Zeitler, G. Kramer, and A.C. Singer, "Bayesian Parameter Estimation Using Single-Bit Dithered Quantization," *IEEE Transactions on Signal Processing*, Vol. 60, No. 6, pp. 2713 -2726, June 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*, Volume 6, No. 9, pp. 2511- 2521, September 2012.
56. J. W. Choi, B. Shim, and A.C. Singer, "Efficient Soft-Input Soft-Output Tree Detection via an Improved Path Metric," *IEEE Trans. Information Theory*," vol. 58, pp. 1518-1533, March 2012.
57. R.J. Drost, and A.C. Singer, "Fast Recursive Equalizers for 1D and 2D Linear Equalization," *IEEE Transactions on Signal Processing*, Vol. 60, No. 12, pp. 3886-3891, July 2012.
58. L.N. Rajan, M. Lu, N.R. Shanbhag, and A.C. Singer, and N.R. Shanbhag, "BER-Optimal Analog-to-Digital Converters for Communication Links," *IEEE Transactions on Signal Processing*, Volume: 60, No. 7, pp. 3683- 3691, July 2012.
59. S.S. Kozat, K.M. Guan, and A.C. Singer, "Tracking the best level set in a level-crossing analog-to-digital converter," *Digital Signal Processing*, vol. 23, no. 1, pp. 478-487, Jan. 2013.
60. K. Kim, N. Kalantarova, S.S. Kozat, and A.C. Singer, "Linear MMSE-Optimal Turbo Equalization Using Context Trees," *IEEE Transactions on Signal Processing*, Volume: 61, no. 12, pp. 3041-3055, June 2013.
61. K. Kim, J. W. Choi, S. S. Kozat, and A. C. Singer, "Low Complexity Turbo-Equalization: A Clustering Approach," *IEEE Communications Letters*, vol. 18, no. 6, pp. 1063-1066, June 2014.
62. R. M. Corey and A. C. Singer, "A Multistage Architecture for Statistical Inference with Stochastic Signal Acquisition", *Journal of Signal Processing Systems*, vol. 84, no. 3, pp. 425-434, Jul. 2015.
63. Y. Lin, M. Keel, A. Faust, A. Xu, N. Shanbhag, E. Rosenbaum, A. Singer, "A Study of BER-optimal ADC-based Receiver for Serial Links," *IEEE Transactions on Circuits and Systems I*, vol. 63, no. 5, May 2016, pp. 693 – 704.

64. M. A. Donmez, M. Raginsky and A. C. Singer, "Online Optimization Under Adversarial Perturbations," in *IEEE Journal of Selected Topics in Signal Processing*, vol. 10, no. 2, pp. 256-269, March 2016.

#### 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.
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Christopher Cole, Daniel Mahgerefteh, TheLinh Nguyen, Andrew Singer, Naresh Shanbhag, "Phase Shift Keyed Modulation of Optical Signal Using Chirp Managed Laser," Filed 2008, US Patent Number 8,068,742, Filed July 10, 2008, Granted Nov. 29, 2011.

Jonathan B. Ashbrook, Andrew C. Singer, Naresh R. Shanbhag, Robert J. Drost, "Tuning System and Method Using a Simulated Bit Error Rate for Use in an Electronic Dispersion Compensator," US Patent Number 8,102,938, Filed April, 2008, Granted, Jan. 24, 2012.

A.C. Singer and N.R. Shanbhag, "Method and System Having Adjustable Analog-To-Digital Conversion Levels," Filed May 19, 2011, issued June 11, 2013, US Patent Number 8,462,037.

Hyeon Min Bae, N.R. Shanbhag, A.C. Singer, "Baseband Phase-Locked Loop," Filed 2007, issued Jan. 22, 2013. US Patent number US8358729 B2.

T.J. Riedl, A.C. Singer, "System and method for broadband doppler compensation," US Patent number 9,608,738, issued Mar 28, 2017.

## UNIVERSITY SERVICE (past 5 years)

Interim Director of the Siebel Center for Design. Campus Core Committee Chair, Design Center Initiative and Building. Oversee \$48MM project for the development, design, and construction of a new campus-wide design center.

Innovation, Leadership, and Engineering Entrepreneurship (ILEE) degree and academic unit founding Director and Unit Head.

Director, Technology Entrepreneur Center and Special Advisor to the Dean on Innovation and Entrepreneurship, College of Engineering, providing undergraduate and graduate curricula and activities in engineering entrepreneurship and innovation for COE students with over 5000 students enrolled in courses and programs annually.

Organizer and host of annual Illinois Innovation Prize, Cozad New Venture Competition, and NSF I-Corps Site, supervise operation of the Student Innovation Incubator and the Innovation Living Learning Community.

Departmental Committees: ECE Advisory Committee, ECE Faculty Representative to the Faculty Senate, Chair, ECE Conflict Management Oversight committee.

College Committees: Chair, Center for Innovation and Design; Co-Chair Provost's Roundtable on Entrepreneurship.

National Science Foundation Innovation Corps (NSF I-Corps) Program (PI for Illinois I-Corps Site and co-PI for Illinois-Michigan-Purdue Regional Node).

#### PROFESSIONAL SOCIETY SERVICE

*Computing in Science and Engineering*, Editorial board member, IEEE Signal Processing Society liaison.

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, Small Business Innovative Research, Engineering, 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 Venturewell (formerly National Collegiate Inventor and Innovators Alliance) proposals.

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 Regional Chair, 2017-present, 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 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.

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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 running and triathlon, and trail running.