

Andrew C. Singer

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CURRENT ACADEMIC POSITIONS

Fox Family Professor in the Department of Electrical and Computer Engineering,
Professor in the Coordinated Science Laboratory,
Director, Technology Entrepreneur Center, College of Engineering,
Dean's Special Advisor on Innovation and Entrepreneurship, 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 engineering entrepreneurship. Research interests include signal processing and communication circuits and systems, adaptive decision making, 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

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 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.
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**

Consultant and expert witness to telecommunication, circuits, and signal processing industries. Recent cases include:

Fujitsu Network Communications, Inc. v. Tellabs, Inc., 1:09-cv-4530 (Filed 7/27/2009 in the Northern District of Illinois); Tellabs, Inc. v. Fujitsu Network Communications, Inc., 08-CV-3379 (Filed 6/11/2008 in the Northern District of Illinois); Retained by Sidley Austin as testifying expert for both infringement and non-infringement aspects, representing Tellabs, Inc. Deposition and court testimony.

In re Certain Semiconductor Chips and Products Containing Same, ITC Investigation No. 337-TA-753 (Filed 12/1/2010 before the International Trade Commission); Retained by Finnegan, Henderson, Farabow, Garrett & Dunner on behalf of Rambus as a testifying expert for infringement. Deposition and court testimony.

Hill-Rom, Inc. v. Stryker Corp., 1:11-CV-01120-JMS-DKL (Filed 8/15/2011 in the Southern District of Indiana); Retained by Kirland Ellis on behalf of Hill-Rom, Inc. as a testifying expert for infringement. Deposition testimony.

Mobile Telecommunications Technologies, LLC v. Clearwire Corporation, Clearwire Wireless, LLC, and Clearwire US, LLC, Case No. 2:12-CV-308, in the Eastern District of Texas; Retained by Shook, Hardy & Bacon, L.L.P. on behalf of Clearwire Wireless as a testifying expert for noninfringement. Deposition testimony.

Mobile Telecommunications Technologies, LLC v. Sprint Nextel Corp., Case No. 2:12-cv-832-JRG-RSP (Eastern District of Texas); Retained by Shook, Hardy & Bacon, L.L.P. on behalf of Sprint Nextel Corp as a testifying expert for noninfringement. Deposition testimony.

Spherix Inc. v. Cisco Systems, Inc., Civ. No. 1:14-cv-393-SLR (D. Del.); Retained by Kirkland Ellis on behalf of Cisco Systems as a testifying expert for noninfringement.

Reexamination Control No. 95/002,051 Inter Partes Reexamination of: U.S. Patent No. 7,568,246; Retained by Barnes & Thornburg LLP on behalf of Hill-Rom as a consultant and expert witness.

Inter Partes Review U.S. Patent No. 6,222,848; Retained by Kirkland Ellis on behalf of Cisco Systems as a consultant and expert witness.

Case No. IPR2014-01379, Inter Partes Review of U.S. Patent No. 6,744,375; Retained by Erise IP, P.A. as an expert witness and consultant on behalf of Garmin International.

- 11/14 – Pres. **OceanComm, Incorporated**, Champaign, IL. Founder and Chief Executive Officer. SBIR-funded technology company commercializing underwater acoustic modem technology.
- 12/08 – Pres. **Diagnostic Photonics**, Champaign, IL. Member of Board of Directors.
- 12/07 – Pres. **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 in the Electrical and Computer Engineering Department. Research sponsors include the Office of Naval Research, the National Science Foundation, Defense Advanced Research Projects Agency, and 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, Underwater Acoustic Communications Laboratory.
- 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 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.
- 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. 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 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 μ m CMOS," *IEEE Journal of Solid-State Circuits*, vol. 40, no. 8, Aug. 2005, pp. 1718 - 1725.

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