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## PROFESSIONAL INTERESTS

Statistical pattern recognition, nonparametric estimation, learning theory, information theory, wireless networks, sensor networks, adaptive/hybrid systems, signal processing, image and video processing, applied probability, econometrics and finance.

## EDUCATION

- **Massachusetts Institute of Technology**, Cambridge, MA 02139
  Ph.D. in Electrical Engineering, June 1991.   Dissertation: "Problems of Computational and Information Complexity in Machine Vision and Learning."    Advisor: Professor S.K. Mitter.

- **Stanford University**, Stanford, CA 94305
  M.S. in Electrical Engineering, June 1985.

- **Clarkson University**, Potsdam, NY 13676
  M.S.in Mathematics, May 1985.
  B.S. in Electrical Engineering, May 1984; B.S. in Mathematics, May 1983.

## CURRENT STATUS

- **Director**, Keller Center, Princeton University                                            9/11 - present
- **Professor**, Department of Electrical Engineering, Princeton University        7/04 - present
- **Affiliated Faculty**, Department of Operations Research and Financial Engineering
- **Affiliated Faculty**, Department of Philosophy

## PRIOR PROFESSIONAL EXPERIENCE

- **Princeton University**, Princeton, NJ 08544
  Master, Butler College, Princeton University                                                   7/04 - 7/12
  Associate Dean for Academic Affairs, School of Engineering and Applied Science 7/03 - 7/05
  Associate Professor, Department of Electrical Engineering.                             7/97 - 6/04
  Assistant Professor, Department of Electrical Engineering                              9/91 - 6/97

- **Susquehanna International Group**, Bala Cynwyd, PA 19004                    8/97 - 8/01
  Regular consultant in quantitative research, statistical arbitrage, and analysis of firm-wide stock trading.

- **Flarion Technologies, Inc.**, Bedminster, NJ 07921                              6/01 - 8/01
  Visiting researcher. Investigated downlink packet scheduling with quality-of-service requirements and throughput of wireless networks.

- **M.I.T. Lincoln Laboratory**, Lexington, MA 02173                               7/85-8/91
  Member of Technical Staff in Laser Radar Measurements Group. Investigated feasibility of laser radars for imaging and discrimination of vehicles in flight.

- **M.I.T.**, Cambridge, MA 02139                                                        9/90-8/91
  Graduate Resident in an undergraduate dormitory. Organized, advised, and provided support (personal, social, academic) for a floor of 42 students.

- **University of Massachusetts**, Boston, MA                                          1/86-5/86
  As a part-time faculty, taught a course entitled "Introduction to Engineering".

## AWARDS AND HONORS

- Best Paper Award, 3rd International Workshop on Hot Topics in Peer-to-peer Computing and Online Social Networking (HotPOST '11), (with S. Shang, P. Hui, P. Cuff), December, 2011.

- Excellence in Teaching Award from Undergraduate Engineering Council for Introduction to Electrical Signals and Systems course taught Fall 2010.

- Phi Beta Kappa Teaching Award, Princeton University, June 2009.

- President's Award for Distinguished Teaching, Princeton University, June 2007.

- Excellence in Teaching Award from Undergraduate Engineering Council for Introduction to Electrical Signals and Systems course taught Fall 2006.

- IEEE Fellow, 2004.

- Distinguished Teacher Award, School of Engineering and Applied Science, Princeton University, May 2004.

- Excellence in Teaching Award from Undergraduate Engineering Council for Introduction to Electrical Signals and Systems course taught Fall 2003.

- Co-supervised Senior thesis that won MacCracken Award for outstanding Senior thesis in Engineering and Applied Sciences, 2003.

- Faculty advisor for student that won Intel Research Award, 2002-2003.

- Walter Curtis Johnson Prize for Teaching Excellence in Electrical Engineering, 2002.

- Co-author of paper that won best student paper award at IEEE International Conference on Information Technology, Coding, and Compression, 2001.

- Excellence in Teaching Award from Undergraduate Engineering Council for Introduction to Electrical Signals and Systems course taught Fall 2000.

- Excellence in Teaching Award from Undergraduate Engineering Council for Introduction to Electrical Signals and Systems course taught Fall 1999.

- Co-supervised Senior thesis that won MacCracken Award for outstanding Senior thesis in Engineering and Applied Sciences, 1996.

- Senior Member of IEEE, 1996.

- Co-author of paper that won honorable mention for best student paper at IEEE Conference on Decision and Control, 1995.

- NSF Young Investigator Award (NYI), 1994.

- Emerson-Keyes Faculty Advancement Award from the School of Engineering and Applied Sciences, Princeton University, 1994.

- Co-supervised Senior thesis that won MacCracken Award for outstanding Senior thesis in Engineering and Applied Sciences, 1993.

- Excellence in Teaching Award from Undergraduate Engineering Council for Image Processing course taught Spring 1993.

- ARO (Army Research Office) Young Investigator Award, 1992.

- NSF Research Initiation Award, 1992.

- Excellence in Teaching Award from Undergraduate Engineering Council for Machine Vision course taught Fall 1991.

- Supervised Senior thesis at M.I.T. which won $2^{nd}$ prize for best undergraduate thesis in Electrical Engineering, 1987.

- Stanford University Fellowship, 1985.

- Frederica Clarkson Award for outstanding graduating Senior, Clarkson University, 1983.

- Hamlin-Darraugh Award for outstanding Senior in Mathematics Department, Clarkson University, 1983.

- Outstanding Sophomore Award, Mathematics Department, Clarkson University, 1982.

## BOOKS, MONOGRAPHS, EDITED BOOKS/SPECIAL ISSUES

- A. Akansu, S.R. Kulkarni, M. Avellaneda, A.R. Barron (Guest Editors), *IEEE Journal on Selected Topics in Signal Processing, Special Issue on Signal Processing Methods in Finance and Electronic Trading*, Vol. 6, No. 4, August 2012.

- I. Pollak, M. Avellaneda, E. Bacry, R. Cont, S.R. Kulkarni (Guest Editors), *Signal Processing Magazine, Special Issue of on Signal Processing for Financial Applications*, September 2011.

- G. Harman and S.R. Kulkarni, *An Elementary Introduction to Statistical Learning Theory*, Wiley, June, 2011.

- Q. Wang, S.R. Kulkarni, S. Verdú, "Universal Estimation of Information Measures for Analog Sources," *Foundations and Trends in Communications and Information Theory*, Vol. 5, No. 3, pp. 265-353, 2009.

- G. Harman and S.R. Kulkarni, *Reliable Reasoning: Induction and Statistical Learning Theory*, MIT Press, May, 2007.

## BOOK CHAPTERS

- G. Harman and S.R. Kulkarni, "Statistical Learning Theory and Induction," *Encyclopedia of the Sciences of Learning*, Norbert M. Seel, ed., pp. 3186-3188, Springer, 2012.

- S.R. Kulkarni and S.E. Posner, "Universal Output Prediction and Nonparametric Regression for Arbitrary Data," in *Learning, Control and Hybrid Systems*, edt. by Y. Yamamoto and S. Hara, Lecture Notes in Control and Information Sciences Vol. 241, Springer-Verlag, pp. 254-268, 1999.

- J. Hocherman-Frommer, S.R. Kulkarni, P.J. Ramadge, "Controller Switching Based on Output Predictions," in *Learning, Control and Hybrid Systems*, edt. by Y. Yamamoto and S. Hara, Lecture Notes in Control and Information Sciences Vol. 241, Springer-Verlag, pp. 135-149, 1999.

- S.R. Kulkarni and P.J. Ramadge, "On the Performance and Complexity of a Class of Hybrid Controller Switching Policies," in *Control Using Logic-Based Switching*, edt. by S. Morse, Lecture Notes in Control and Information Sciences Vol. 222, Springer-Verlag, pp. 248-261, 1997.

- S.R. Kulkarni, "A Review of Some Extensions to the PAC Learning Model," in *Learning and Geometry: Computational Approaches*, edt. by C. Smith and D. Keuker, pp. 43-64, Birkhauser, Boston, 1996.

- S.R. Kulkarni, "A Review of Some Extensions to the PAC Learning Model," in *Computing and Intelligent Systems*, edt. by S.S. Keerthi, Y. Narahari, N. Viswanadham, Tata McGraw-Hill, 1994.

- S.R. Kulkarni, S.K. Mitter, T.J. Richardson, "An Existence Theorem and Lattice Approximations to a Variational Problem," *Signal Processing, Part I: Signal Processing Theory*, IMA Vol. 22, edt. by Auslander et al., Springer-Verlag, pp. 189-210, 1990.

## JOURNAL PUBLICATIONS

**Under Review or In Press**

- J. Yu, S.R. Kulkarni, H.V. Poor, "Dimension Expansion and Customized Spring Potentials for Sensor Localization," submitted to *EURASIP Journal on Advances in Signal Processing.*

- J. Lundén, S.R. Kulkarni, V. Koivunen, H.V. Poor, "Multiagent reinforcement learning based spectrum sensing policies for cognitive radio networks," submitted to *IEEE Journal of Selected Topics in Signal Processing.*

- M. Ozay, I. Esnaola, F.T. Yarman-Vural, S.R. Kulkarni, H.V. Poor, "Machine Learning Methods for Attack Detection in the Smart Grid," submitted to *IEEE Transactions on Smart Grid.*

- M. Ozay, I. Esnaola, F.T. Yarman-Vural, S.R. Kulkarni, H.V. Poor, "Sparse Attack Construction and State Estimation in the Smart Grid: Centralized and Distributed Models," submitted to *IEEE Journal on Selected Areas in Communications - Special series on Smart Grid Communications.*

- M. Ozay, H. Zheng, F.T. Yarman-Vural, S.R. Kulkarni, H.V. Poor, "Consensus Segmentation for Level Selection and Fusion," submitted to *IEEE Trans. on Geoscience and Remote Sensing.*

- H. Zheng, S.R. Kulkarni and H.V. Poor, "From Consensus Clustering to Boolean Satisfiability: The Filtered Stochastic Local Search Algorithm," submitted to *Pattern Recognition.*

- D. Shutin, H. Zheng, S.R. Kulkarni, H.V. Poor, "Variational Bayesian Attribute-Distributed Learning," submitted to *IEEE Transactions on Pattern Analysis and Machine Intelligence.*

**Appeared**

86. M.K. Miller, G. Wang, S.R. Kulkarni, H.V. Poor, and D. Osherson, "Citizen Forecasts of the 2008 U.S. Presidential Election," *Politics & Policy*, Vol. 40, No. 6, pp. 1019-1052, 2012.

85. D. Shutin, S.R. Kulkarni, H.V. Poor, "Incremental Reformulated Automatic Relevance Determination," *IEEE Transactions on Signal Processing*, Vol. 60, Issue 9, pp. 4977-4981, Sept. 2012.

84. A. Jain, D. Gündüz, S.R. Kulkarni, H.V. Poor, S. Verdú, "Energy-Distortion Tradeoffs in Gaussian Joint Source-Channel Coding Problems," *IEEE Transactions on Information Theory*, Vol. 58, No. 5, pp. 3153-3168, May 2012.

83. D. Shutin, C. Zechner, S.R. Kulkarni, H.V. Poor, "Regularized Variational Bayesian Learning of Echo State Networks with Delay & Sum Readout," *Neural Computation*, Vol. 24, No. 4, pp. 967-995, April 2012.

82. J. Yu, S.R. Kulkarni, H.V. Poor, "Robust Ellipse and Spheroid Fitting," *Pattern Recognition Letters*, Vol. 33, Issue 5, pp. 492-499, April 2012.

81. A. Jain, S.R. Kulkarni, S. Verdú, "Energy Efficiency of Decode-and-Forward for Wideband Wireless Multicasting," *IEEE Transactions on Information Theory*, Vol. 57, No. 12, pp. 7695-7713, Dec. 2011.

80. D. Shutin, T. Buchgraber, S.R. Kulkarni, H.V. Poor, "Fast Variational Sparse Bayesian Learning with Automatic Relevance Determination," *IEEE Transactions on Signal Processing*, Vol. 59, No. 12, pp. 6257-6261, Dec. 2011.

79. A.B. Wagner, P. Viswanath, S.R. Kulkarni, "Probability Estimation in the Rare-Events Regime," *IEEE Transactions on Information Theory*, Vol. 57, No. 6, pp. 3207-3229, June 2011.

78. G. Wang, S.R. Kulkarni, H.V. Poor, D. Osherson, "Aggregating Large Sets of Probabilistic Forecasts by Weighted Coherent Adjustment," *Decision Analysis*, Vol. 8, No. 2, pp. 128-144, June 2011.

77. S.R. Kulkarni and G. Harman, "Statistical Learning: A Tutorial," *Wiley Interdisciplinary Reviews: Computational Statistics*, Vol. 3 pp. 543-556, 2011.

76. A. Jain, S.R. Kulkarni, S. Verdú, "Multicasting in Large Wireless Networks: Bounds on the Minimum Energy per Bit," *IEEE Transactions on Information Theory*, Vol. 57, No. 1, pp. 14-32, January 2011.

75. H. Zheng, S.R. Kulkarni, H.V. Poor, "Attribute-distributed Learning: Models, Limits and Algorithms," *IEEE Transactions on Signal Processing*, Vol. 59, No. 1, pp. 386-398, January 2011.

74. J. Yu, H. Zheng, S.R. Kulkarni, H.V Poor, "Two-Stage Outlier Elimination for Robust Curve and Surface Fitting," *EURASIP Journal on Advances in Signal Processing*, Vol. 2010, Article ID 154891, 13 pages, 2010.

73. S. Brunton, C.W. Rowley, S.R. Kulkarni, C. Clarkson, "Maximum Power Point Tracking for Photovoltaic Optimization Using Ripple-Based Extremum Seeking Control," *IEEE Transactions on Power Electronics*, Vol. 25, No. 10, pp. 2531-2540, October 2010.

72. F. Pérez-Cruz and S.R. Kulkarni, "Robust and Low Complexity Distributed Kernel Least Squares Learning in Sensor Networks," *IEEE Signal Processing Letters*, Vol. 17, No. 4, pp. 355-358, April 2010.

71. J. B. Predd, R. Seiringer, E. J. Lieb, D. Osherson, S.R. Kulkarni, H.V. Poor, "Probabilistic Coherence and Proper Scoring Rules," *IEEE Transactions on Information Theory*, Vol. 55, No. 10, pp. 4786-4792, October 2009.

70. G. Harman, S.R. Kulkarni, "Precis of Reliable Reasoning: Induction and Statistical Learning Theory" and "Response to Shafer, Thagard, Strevens, and Hanson," *Abstracta, Special Issue III*, pp. 5-9, 47-56, 2009.

69. C.-C. Wang, S.R. Kulkarni, H.V. Poor, "Finding All Small Error-Prone Substructures in LDPC Codes," *IEEE Transactions on Information Theory*, Vol. 55, No. 5, pp. 1976-1998, May 2009.

68. Q. Wang, S.R. Kulkarni, and S. Verdú, "Divergence estimation for multi-dimensional distributions via $k$-nearest-neighbor distances," *IEEE Transactions on Information Theory*, Vol. 55, No. 5, pp. 2392-2405, May 2009.

67. J.B. Predd, S.R. Kulkarni, H.V. Poor, "A Collaborative Training Algorithm for Distributed Learning," *IEEE Transactions on Information Theory*, Vol. 55, No. 4, pp. 1856-1871, April 2009.

66. J. Deng, Y.S. Han, S.R. Kulkarni, "Can Multiple Subchannels Improve the Delay Performance of RTS/CTS-based MAC Schemes?" *IEEE Transactions on Wireless Communications*, Vol. 8, No. 4, pp. 1591-1596, April 2009.

65. J.B. Predd, D. Osherson, S.R. Kulkarni, H.V. Poor, "Aggregating Forecasts of Chance from Incoherent and Abstaining Experts," *Decision Analysis*, Vol. 5, No. 4, pp. 177-189, December 2008.

64. A.P. George, W.B. Powell, and S.R. Kulkarni, "Value Function Approximation Using Hierarchical Aggregation or Multiattribute Resource Management," *Journal of Machine Learning Research*, Vol. 9, pp.2079–2111, October 2008.

63. H. Li, P. R. Barbosa, E. K. P. Chong, J. Hannig, and S. R. Kulkarni, "Zero-error target tracking with limited communication," *IEEE Journal on Selected Areas in Communications, special issue on Control and Communications*, Vol. 26, no. 4, pp. 686–694, May 2008.

62. A.C. Lozano, S.R. Kulkarni, P. Viswanath, "Throughput Scaling in Wireless Networks with Restricted Mobility," *IEEE Transactions on Wireless Communications*, Vol. 6, No. 2, pp. 670-679, February 2007.

61. C.-C. Wang, S.R. Kulkarni, H.V. Poor, "On Finite-Dimensional Bounds on $Z^m$ and Binary LDPC Codes with Belief Propagation Decoders," *IEEE Transactions on Information Theory*, Vol. 53, No. 1, pp. 56-81, January 2007.

60. G. Harman and S.R. Kulkarni, "The Problem of Induction," *Philosophy and Phenomenological Research*, Vol. 72, No. 3, pp. 559-575, 2006.

59. J.B. Predd, S.R. Kulkarni, H.V. Poor, "Distributed Learning for Decentralized Inference in Wireless Sensor Networks," *IEEE Signal Processing Magazine, Special Issue on Distributed Signal Processing in Wireless Sensor Networks*, Vol. 23, No. 4, pp. 56-69, July 2006.

58. H. Cai, S.R. Kulkarni, S. Verdú, "An Algorithm for Universal Lossless Compression with Side Information," *IEEE Transactions on Information Theory*, Vol. 52, pp.4008-4016, Sep. 2006.

57. H. Cai, S.R. Kulkarni, S. Verdú, "Universal Divergence Estimation for Finite-Alphabet Sources," *IEEE Transactions on Information Theory*, Vol. 52, pp. 3456-3475, Aug. 2006.

56. J. Hannig, E.K.P. Chong, S.R. Kulkarni, "Relative frequencies of generalized simulated annealing," *Mathematics of Operations Research*, Vol. 31, No. 1, pp. 199-216, February 2006.

55. A. Marar, W.B. Powell, S.R. Kulkarni, "Combining Cost-Based and Rule-Based Knowledge in Complex Resource Allocation Problems," *IIE Transactions*, Vol. 38, No. 2, pp. 159-172, 2006.

54. J. B. Predd, S.R. Kulkarni, H. V. Poor, "Consistency in Models of Distributed Learning Under Communication Constraints," *IEEE Transactions on Information Theory*, Vol. 52, No. 1, pp. 52-63, Jan. 2006.

53. C.-C. Wang, S.R. Kulkarni, H.V. Poor, "Density Evolution for Asymmetric Memoryless Channels," *IEEE Transactions on Information Theory*, Vol. 51, No. 12, pp. 4216-4236, Dec. 2005.

52. Q. Wang, S.R. Kulkarni, S. Verdú, "Divergence Estimation of Continuous Distributions Based on Data-Dependent Partitions," *IEEE Transactions on Information Theory*, Vol. 51, No. 9, pp. 3064-3074, Sept. 2005.

51. C.-C. Wang, S.R. Kulkarni, H.V. Poor, "Arbitrary Side Observations in Bandit Problems," *Advances in Applied Mathematics (special David Robbins memorial issue)*, Vol. 34, No. 4, pp. 903-938, May 2005.

50. C.-C. Wang, S.R. Kulkarni, H.V. Poor, "Bandit Problems With Side Observations," *IEEE Transactions on Automatic Control*, Vol. 50, No. 3, pp. 338-355, March 2005.

49. A. Reznik, S.R. Kulkarni, S. Verdú, "Degraded Gaussian Multi-Relay Channel: Capacity and Optimal Power Allocation," *IEEE Transactions on Information Theory*, Vol. 50, No. 12, pp.3037-3046, December 2004.

48. A. Jovicic, P. Viswanath, S.R. Kulkarni, "Upper Bounds to Transport Capacity of Wireless Networks," *IEEE Transactions on Information Theory*, Vol. 50, No. 11, pp. 2555-2565, November 2004.

47. A. Reznik, S.R. Kulkarni, S. Verdú, "A 'Small World' Approach to Heterogeneous Networks," *Communications in Information and Systems*, Vol. 3, No. 4, pp.325-348, 2003.

46. H. Cai, S.R. Kulkarni, S. Verdú, "Universal Estimation of Entropy Via Block Sorting," *IEEE Transactions on Information Theory*, Vol. 50, No. 7, pp. 1551-1561, July 2004.

45. S.R. Kulkarni and P. Viswanath, "A Deterministic Approach to Throughput Scaling in Wireless Networks," *IEEE Transactions on Information Theory*, Vol. 50, No. 6, pp. 1041-1049, June 2004.

44. R.J. Radke, P.J. Ramadge, S.R. Kulkarni, T. Echigo, "Efficiently Synthesizing Virtual Video," *IEEE Transactions on Circuits and Systems for Video Technology*, Vol. 13, No. 4, pp. 325-337, April 2003.

43. S. Sandilya and S.R. Kulkarni, "Principal Curves with Bounded Turn," *IEEE Transactions on Information Theory*, Vol. 48, No. 10, pp. 2789-2793, Oct. 2002.

42. S.R. Kulkarni, S.E. Posner, S. Sandilya, "Data-dependent $k_n$-NN and Kernel Estimators Consistent for Arbitrary Processes," *IEEE Transactions on Information Theory*, Vol. 48, No. 10, pp. 2785-2788, Oct. 2002.

41. M. Effros, K. Visweswariah, S.R. Kulkarni, S. Verdú, "Universal Lossless Source Coding With the Burrows Wheeler Transform," *IEEE Transactions on Information Theory*, Vol. 48, No. 5, pp. 1061-1081, May 2002.

40. S. Sandilya and S.R. Kulkarni, "Nonparametric Control Algorithms for Nonlinear Fading Memory Systems," *IEEE Transactions on Automatic Control*, Vol. 46, No. 7, pp. 1117-1121, July 2001.

39. K. Visweswariah, S.R. Kulkarni, S. Verdú, "Universal Variable-to-Fixed Length Source Codes," *IEEE Transactions on Information Theory*, Vol. 47, No. 4, pp. 1461-1472, May 2001.

38. P.L. Bartlett, S. Ben David, S.R. Kulkarni, "Learning Changing Concepts by Exploiting the Structure of Change," *Machine Learning*, Vol. 41, No., pp. 153-174, Nov. 2000.

37. K. Visweswariah, S.R. Kulkarni, S. Verdú, "Separation of Random Number Generation and Resolvability," *IEEE Transactions on Information Theory*, Vol. 46, No. 6, pp. 2237-2241, Sept. 2000.

36. K. Visweswariah, S.R. Kulkarni, S. Verdú, "Universal Coding of Nonstationary Sources," *IEEE Transactions on Information Theory*, Vol. 46, No. 4, pp. 1633-1637, July 2000.

35. K. Visweswariah, S.R. Kulkarni, S. Verdú, "Asymptotically Optimal Variable-to-Fixed Length Codes for Markov Sources," *Journal of Combinatorics, Information, and System Sciences*, Vol. 25, 2000.

34. S.R. Kulkarni and G. Lugosi, "Finite Time Lower Bounds for the Two-Armed Bandit Problem," *IEEE Transactions on Automatic Control*, Vol. 45, No. 4, pp. 711-714, April 2000.

33. Y.-P. Tan, D.D. Saur, S.R. Kulkarni, P.J. Ramadge, "Rapid Estimation of Camera Motion from Compressed Video With Application to Video Annotation," *IEEE Transactions on Circuits and Systems for Video Technology*, Vol. 10, No. 1, pp. 133-146, Feb. 2000.

32. M. Vidyasagar and S.R. Kulkarni, "Some Contributions to Fixed-Distribution Learning Theory," *IEEE Transactions on Automatic Control*, Vol. 45, No. 2, pp. 217-234, Feb. 2000.

31. E.K.P. Chong, I.-J. Wang, S.R. Kulkarni, "Noise Conditions for Prespecified Convergence Rates of Stochastic Approximation Algorithms," *IEEE Transactions on Information Theory*, Vol. 45, No. 2, pp. 810-814, March, 1999.

30. G. Morvai, S.R. Kulkarni, A.B. Nobel, "Regression Estimation from an Individual Stable Sequence," *Statistics*, Vol. 33, pp. 99-118, 1999.

29. S.R. Kulkarni and S.E. Posner, "Nonparametric Output Prediction for Nonlinear Fading Memory Systems," *IEEE Transactions on Automatic Control*, Vol. 44, No.1, pp. 29-37, Jan. 1999.

28. S. Di Gennaro, C. Horn, S.R. Kulkarni, P.J. Ramadge, "Reduction of Timed Hybrid Systems," *Discrete Event Dynamic Systems – Theory and Applications*, Vol. 8, No. 4, pp. 343-351, Dec. 1998.

27. S.R. Kulkarni, G. Lugosi, S.S. Venkatesh, "Learning Pattern Classification – A Survey," *IEEE Transactions on Information Theory*, Vo. 44, No. 6, pp. 2178-2206, Oct. 1998.

26. P.L. Bartlett and S.R. Kulkarni, "The Complexity of Model Classes, and Smoothing Noisy Data," *Systems and Control Letters*, Vol. 34, No. 3, pp. 133-140, June 1998.

25. J. Hocherman-Frommer, S.R. Kulkarni, P.J. Ramadge, "Controller Switching Based on Output Prediction Errors," *IEEE Transactions on Automatic Control*, Vol. 43, No. 5, pp. 596-607, May, 1998.

24. H. Schweitzer and S.R. Kulkarni, "Computational Limitations of Model-Based Recognition," *International Journal of Intelligent Systems*, Vol. 13, No. 5, pp. 431-443, May, 1998.

23. K. Visweswariah, S.R. Kulkarni, S. Verdú, "Source Codes as Random Number Generators," *IEEE Transactions on Information Theory*, Vol. 44, No. 2, pp. 462-471, March, 1998.

22. A.B. Nobel, G. Morvai, S.R. Kulkarni, "Density Estimation from an Individual Numerical Sequence," *IEEE Transactions on Information Theory*, Vol. 44, No. 2, pp. 537-541, March, 1998.

21. I.-J. Wang, E.K.P. Chong, S.R. Kulkarni, "Weighted Averaging and Stochastic Approximation," *Mathematics of Control, Signals, and Systems*, Vol. 10, No. 1, pp. 41-60, 1997.

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19. S.R. Kulkarni and M. Vidyasagar, "Learning Decision Rules for Pattern Classification Under a Family of Probability Measures," *IEEE Transactions on Information Theory*, Vol. 43, No. 1, pp. 154-166, January, 1997.

18. S.R. Kulkarni and P.J. Ramadge, "Model and Controller Switching Policies Based on Output Prediction Errors," *IEEE Transactions on Automatic Control*, Vol. 41, No. 11, pp. 1594-1604, November, 1996.

17. I.-J. Wang, E.K.P. Chong, and S.R. Kulkarni, "Equivalent Necessary and Sufficient Conditions on Noise Sequences for Stochastic Approximation Algorithms," *Advances in Applied Probability*, Vol. 28, No. 3, pp. 784-801, Sept., 1996.

16. S. Wang, B. Liu, S.R. Kulkarni, "Model-based Reconstruction of Multiple Circular and Elliptical Discs from a Limited Number of Projections," *IEEE Transactions on Image Processing*, Vol. 5, No. 9, pp. 1386-1390, Sept., 1996.

15. W.C. Karl, S.R. Kulkarni, G.C. Verghese, and A.S. Willsky, "Local Tests for Consistency of Support Hyperplane Data," *Journal of Mathematical Imaging and Vision*, Vol. 6, No. 2-3, pp. 249-267, June, 1996.

14. W. Lam and S.R. Kulkarni, "Extended Synchronizing Codewords for Binary Prefix Codes," *IEEE Transactions on Information Theory*, Vol. 42, No. 3, pp. 984-987, May, 1996.

13. S.R. Kulkarni and C. Horn, "An Alternative Proof for Convergence of Stochastic Approximation Algorithms," *IEEE Transactions on Automatic Control*, Vol. 41, No. 3, pp. 419-424, Mar., 1996.

12. S.R. Kulkarni and O. Zeitouni, "A General Classification Rule for Probability Measures," *Annals of Statistics*, Vol. 23, No. 4, pp. 1393-1407, 1995.

11. S.R. Kulkarni and S.E. Posner, "Rates of Convergence of Nearest Neighbor Estimation under Arbitrary Sampling," *IEEE Transactions on Information Theory*, Vol. 41, No. 4, pp. 1028-1039, July, 1995.

10. S.R. Kulkarni, S.K. Mitter, T.J. Richardson, J.N. Tsitsiklis, "Local Versus Non-local Computation of Length of Digitized Curves," *IEEE Transactions on Pattern Analysis and Machine Intelligence*, Vol. 16, No. 7, pp. 711-718, July, 1994.

9. R.M. Dudley, S.R. Kulkarni, T.J. Richardson, O. Zeitouni, "A Metric Entropy Bound is Not Sufficient for Learnability," *IEEE Transactions on Information Theory*, Vol. 40, No. 3, pp. 883-885, May, 1994.

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19. S.R. Kulkarni, S.K. Mitter, T.J. Richardson, J.N. Tsitsiklis, "On Local Versus Non-local Computation of Length of Digitized Curves," *Proc. of the 13th Conference Foundations of Software Technology & Theoretical Computer Science*, Bombay, India, Springer-Verlag, pp. 94-103. December 1993.

18. S.R. Kulkarni and C. Horn, "Convergence of the Robbins-Monro Algorithm Under Arbitrary Disturbances," *Proc. 32nd IEEE Conference on Decision and Control*, Vol. 1, pp. 537-544, December 1993.

17. S.R. Kulkarni, "A Review of Some Extensions to the PAC Learning Model," *Proc. of Silver Jubilee Workshop on Computing and Intelligent Systems,* pp. 122-137, Bangalore, India, December 1993.

16. D.C. Dodd, S.R. Kulkarni, and W.H. Wolf, "An Automatic Video-Based Vehicle Classification System," *Proc. IEEE Regional Control Conference,* NJIT, Aug. 1993.

15. S.R. Kulkarni, "Applications of PAC Learning to Problems in Geometric Reconstruction," *Proc. Twenty-seventh Annual Conf. on Information Sciences and Systems,* Johns Hopkins University, March 1993, pp. 229-234.

14. S.E. Posner, and S.R. Kulkarni, "On-Line Learning of Functions of Bounded Variation Under Various Sampling Schemes," *Proc. Sixth Annual Workshop on Computational Learning Theory,* pp.439-445, 1993.

13. S.R. Kulkarni and O. Zeitouni, "On Probably Correct Classification of Concepts," *Proc. Sixth Annual Workshop on Computational Learning Theory,* pp. 111-116, 1993.

12. S.E. Posner and S.R. Kulkarni, "On-line Learning of Linear Systems," *American Control Conference,* 1993.

11. W. Lam and S.R. Kulkarni, "Extended Synchronizing Codewords for Binary Prefix Codes," *IEEE International Symposium on Information Theory,* San Antonio, TX, Jan., 1993.

10. N.L.A. Chang, S.R. Kulkarni, and J. Koplowitz, "Adaptive Chain Coding for Arbitrary Curves," *SPIE Vol. 1830, Curves and Surfaces in Computer Vision and Graphics III*, pp. 296-307, 1992.

9. S.R. Kulkarni, S.K. Mitter, J.N. Tsitsiklis, and O. Zeitouni, "PAC Learning With Generalized Samples and an Application to Stochastic Geometry," *Proc. Fifth Annual Workshop on Computational Learning Theory*, pp. 172-179, 1992.

8. S.R. Kulkarni and D.N.C. Tse, "A Paradigm for Class Identification Problems," *Princeton Conference on Information Sciences and Systems*, pp. 442-447, 1992.

7. P. Milanfar, W.C. Karl, S.R. Kulkarni, and A.S. Willsky, "Geometric Aspects of Tomographic Signal Processing," *Workshop on Multidimensional Signal Processing*, Lake Placid, NY, Sept., 1991.

6. S.K. Mitter, and S.R. Kulkarni, "Learning and Adaptation in Machine Vision," *American Control Conference*, San Diego, May, 1990.

5. A.S. Lele, S.R. Kulkarni, A.S. Willsky, "Convex Set Estimation from Support Line Measurements and Applications to Target Reconstruction from Laser Radar Data," *SPIE Vol. 1222 Laser Radar V*, pp. 58-82, Los Angeles, Jan., 1990.

4. S.R. Kulkarni, and S.K. Mitter, "On Metric Entropy, Vapnik-Chervonenkis Dimension, and Learnability for a Class of Distributions," *AAAI Symposium on Minimal Length Encoding*, Stanford, March, 1990. Also, Center for Intelligent Control Systems Report CICS-160, M.I.T., 1989.

3. R.M. Marino, M.F. Reiley, K.I. Schultz, S.R. Kulkarni, A.S. Lele, "Near Term Laser Radars: Performance Analysis Through Simulations," *IRIS Active Systems*, Boulder, Oct., 1988. (SECRET)

2. F.K. Knight, S.R. Kulkarni, A.S. Lele, "3D Reconstruction of Targets from 2D Angle-Angle Images," *IRIS Active Systems*, Orlando, Oct., 1987. (SECRET)

1. S.R. Kulkarni, et al., "Image Reconstruction from Laser Radar Reflective Projections," *DARPA Strategic Systems Symposium*, Monterey, Oct., 1987. (SECRET)

**TECHNICAL REPORTS, MEMORANDA, AND OTHER**

- S.R. Kulkarni, "The Probability of Close Elections," contribution for Institute of Election Analysis, webpage http://www.leinsdorf.com, Nov. 16, 2000.

- S.R. Kulkarni, and S.K. Mitter, "Some Discrete Approximations to a Variational Method for Image Segmentation," Laboratory for Information and Decision Systems Report LIDS-P-2014, M.I.T., January, 1991.

- S.R. Kulkarni, A.S. Lele, M.F. Reiley, "On the Qualitative Differences Between Tomographic Reconstructions from Range-resolved Versus Doppler-resolved Data," Lincoln Laboratory Project Memorandum 52PM-ODT-0042, August, 1989.

- S.R. Kulkarni, "Minkowski Content and Lattice Approximations to a Variational Problem," Center for Intelligent Control Systems Report CICS-95, M.I.T., 1988.

- S.R. Kulkarni, and A.S. Lele, "A Multiple Target Tracking Algorithm Supporting RV/Decoy Discrimination During Deployment," Lincoln Laboratory Project Memorandum 52PM-ODT-0026, November, 1988. (SECRET)

- S.R. Kulkarni, and A.S. Lele, "TARMAN: A Computer Model for the Prediction of Laser Radar Signatures of Multiple Complex Dynamic Targets," Lincoln Laboratory Project Report ODT-7, November, 1987.

# GRANTS

## CURRENT AND FORMER

- **National Science Foundation**, Science and Technology Center on the Science of Information. Co-Principal Investigator (with faculty from Princeton, Purdue, Illinois, Berkeley, Bryn Mawr, Howard). My share is approximately $900,000 for the period 9/1/2010 - 8/31/2015.

- **Deutsche Telekom**. Routing as a Distributed Learning Problem. Principal Investigator. $346,000 for the period 7/1/2010 - 6/30/2014.

- **Office of Naval Research**. Distributed Learning for Active and Passive Sonar. Principal Investigator. $320,000 for the period 2/1/2007 - 1/31/2011.

- **Army Research Office**, MURI. Model Classes, Approximation, and Metrics for Dynamic Processing of Urban Terrain Data. Co-Principal Investigator (with faculty from Univ. South Carolina, UCLA, Texas A&M, Virginia Tech). My share is approximately $280,000 for the period 5/1/2007 - 4/30/2011.

- **Princeton Power Systems**. Algorithm Research and Testing for a High Efficiency Solar Power Conversion Technology, $78,370 for the period 7/13/06 - 7/13/08.

- **National Science Foundation**, Small Scale ITR (Information Technology Research). Distributed Learning in Sensor Networks. Principal Investigator. $210,000 for the period 9/1/03 - 8/31/06.

- Directed grant from donor (Don Dixon), in recognition for outstanding contributions to research, teaching, and advising. $60,000 for 2005-2006.

- **Draper Laboratory**, University IR&D Program. Distributed Learning in Sensor Networks. Principal Investigator. $70,000 for the period 7/1/03 - 6/30/04, $70,000 for the period 7/1/04 - 6/30/05.

- **Army Research Office**, MURI. Data Fusion in a Sensorweb. Co-Principal Investigator (with S. Verdú and faculty from M.I.T., Illinois). Grant total is $2,200,000, my share is approximately $375,000 for the period 6/1/00 - 5/31/05.

- **Army Research Office**, MURI Fellow. Data Fusion in a Sensorweb. Co-Principal Investigator (with S. Verdú). $148,000 to support a joint Ph.D. student for the period 9/1/00 - 8/31/03.

- **Princeton University Sophomore Initiative**. Enhancement of ELE 201 – Introduction to Electrical Signals and Systems. Principal Investigator. $22,200 for the period 7/1/02 - 6/30/04.

- **National Science Foundation**, Knowledge and Distributed Systems. Learning, Adaptation, and Layered Intelligent Systems. Co-Principal Investigator (with faculty from M.I.T., Berkeley, Illinois). Grant total is $400,000 per year, my share is approximately $162,000 for the period 10/1/98 - 9/30/01, extension through 9/30/02.

- **IBM Tokyo Research Center**. Video Browsing Using Mosaicking. Co-Principal Investigator (with P. Ramadge). $185,000 for the period 5/15/97 - 12/31/00.

- **Princeton University**, University Research Board AR Tuition Award. Principal Investigator. Tuition for S. Sandilya for '99-'00 academic year.

- **Intel Corporation**. Princeton Panorama Project. Co-Principal Investigator (with P. Ramadge). $80,000 for the period 8/1/96 - 7/31/97.

- **Princeton University**, 250th Anniversary Fund for Innovations in Teaching. New course development: Learning Theory and Epistemology. Co-Principal Investigator (with G. Harman, Philosophy). $34,000 plus AI support, 7/1/96 - 5/31/97.

- **N.J. Commission on Science and Technology**. N.J. Center for Multimedia Research. Co-Principal Investigator (with faculty from Princeton and NJIT). $500,000/year for five years, 1995-2000.

- **IBM Fellowship**. Video Analysis and Manipulation. Co-advisor (with P. Ramadge) for Ph.D. student Y.-P. Tan. Tuition plus stipend for '95-'96 and '96-97.

- **National Science Foundation**, Young Investigator Award (NYI). Foundations of Adaptive and Learning Systems. Principal Investigator. $312,500 for the period 8/15/94 - 7/31/99, extension to 7/31/00.

- **Princeton University**, University Research Board AR Tuition Award. Principal Investigator. Tuition for S.E. Posner for '93-'94 academic year.

- **National Science Foundation**, Group Travel Grant. Workshop on Computing and Intelligent Systems, Dec. 20-22, 1993, Bangalore India. Principal Investigator. $10,000 for the period 11/1/93 - 10/31/94.

- **Army Research Office**, Group Travel Grant. Workshop on Computing and Intelligent Systems, Dec. 20-22, 1993, Bangalore India. Principal Investigator. $15,000 for the period 12/1/93 - 5/31/94.

- **Siemens Corporate Research**, Electronic Eye Project. Co-Principal Investigator (with several Princeton faculty). $200,000 per year 11/1/93 - 10/31/95

- **BMFT (German Ministry)**, Artificial Eye Study. Co-Principal Investigator (with several Princeton faculty and Siemens Corporate Research).

- **National Science Foundation**, Small Scale Infrastructure Program. Experimental Facilities for Application-Directed System Synthesis. Co-principal Investigator (with W. Wolf, A. Wolfe, S. Malik, S.Y. Kung, B. Liu). $1,153,584 for the period 10/1/92 - 9/30/97.

- **Army Research Office**, Young Investigator Award. Extending and Unifying Formal Models in Machine Learning. Principal Investigator. $130,000 for the period 8/1/92 - 7/31/95.

- **National Science Foundation**, Research Initiation Award Extensions of Learning Models and Applications to Signal Processing and Geometric Reconstruction. Principal Investigator. $60,000 for the period 7/1/92 - 6/30/94.

# SUMMARY OF TEACHING ACTIVITIES AND ACCOMPLISHMENTS

- **ELE 201 Introduction to Electrical Signals and Systems**
  A sophomore-level required Electrical Engineering course. Taught Fall 1999, Fall 2000, Fall 2001, Fall 2002, Fall 2003, Fall 2004, Fall 2005, Fall 2006, Fall 2007, Fall 2008, Fall 2009, Fall 2010, Fall 2011.

- **ELE 222 Earth (Silicon), Wind (Wireless), and Fire (Fiber-optics): Technologies for the Non-Technologist**
  A course designed to introduce non-electrical engineering majors to important technological areas within electrical engineering. Co-taught with Profs. Sharad Malik and James Sturm in Fall 2002.

- **ELE 391 The Wireless Revolution: Telecommunications for the 21st Century**
  Junior level outreach course. Taught Spring 2009, Spring 2011.

- **ELE 481 Machine Vision**
  A senior level Electrical Engineering course. Taught Fall 1991.

- **ELE 488 Image Processing and Transmission**
  An upper-level undergraduate course, taken primarily by Electrical Engineering majors. Taught Spring 1992, Spring 1993, Spring 1994, Spring 1995.

- **ELE 530 Theory of Detection and Estimation**
  A graduate-level course taken primarily by students in Electrical Engineering with an interest in signals, communications, and control. Taught Spring 1994.

- **ELE 535 Machine Learning and Pattern Recognition**
  Taught Fall 1992, Fall 1993, Spring 1996, Spring 1997.

- **COS 598b/ELE 539b Open Problems in Human and Machine Intelligence**
  A graduate level topics course. Co-taught with Eric Ristad in Spring 1992.

- **ORF 534 Financial Engineering**
  A graduate-level course in the Department of Operations Research and Financial Engineering. Taught Spring 2000, Spring 2001.

- **ORF 535 Statistical Analysis of Large Financial Databases**
  A graduate-level course in the Department of Operations Research and Financial Engineering. Taught Spring 2002.

- **PHI/ELE 218 Learning Theory and Epistemology**
  A cross-listed course between the Departments of Philosophy and Electrical Engineering. Taken by students at a variety of levels with a variety of backgrounds. Co-taught with Prof. Gil Harman in Spring 1997, Fall 1997, Spring 1999, Spring 2001, Spring 2003, Spring 2007, Spring 2010, Spring 2012.

**HIGHLIGHTS**

- Have taught or co-taught courses in Electrical Engineering, Computer Science, Philosophy, and Operations Research & Financial Engineering.

- Phi Beta Kappa Award for Excellence in Undergraduate Teaching, Princeton University, June 2009.

- President's Award for Distinguished Teaching, Princeton University, May 2007.

- SEAS Distinguished Teacher Award, School of Engineering and Applied Science, Princeton University, May 2004.

- Seven E-Council Excellence in Teaching Awards for three different courses:
  – For ELE 481 Machine Vision taught Fall 1991
  – For ELE 488 Image Processing taught Spring 1993.
  – For ELE 201 Introduction to Electrical Signals and Systems taught Fall 1999.
  – For ELE 201 Introduction to Electrical Signals and Systems taught Fall 2000.
  – For ELE 201 Introduction to Electrical Signals and Systems taught Fall 2003.
  – For ELE 201 Introduction to Electrical Signals and Systems taught Fall 2006.
  – For ELE 201 Introduction to Electrical Signals and Systems taught Fall 2010.

- Significant overhaul of curriculum and labs in ELE 201 Introduction to Electrical Signals and Systems. Have attracted students outside of electrical engineering, including a number from the humanities and social sciences. Furthermore, in several years made the course available to qualified high school students through the High School Program run through the Teacher Preparation Program.

- Introduced a new undergraduate course on Machine Vision (ELE 481).

- Introduced a new graduate course on Machine Learning and Pattern Recognition (ELE 535).

- Introduced a new distribution course on Learning Theory and Epistemology (PHI/ELE 218) jointly with Prof. Harman of the Department of Philosophy.

- Have supervised or co-supervised over 100 independent semester/summer projects. Several of these have resulted in journal or conference papers, and three of these projects have won the Calvin-Dodd MacCracken Award for best senior thesis in Engineering and Applied Sciences (May 1993, May 1996, and May 2003).

# ADVISING

## PH.D. STUDENTS GRADUATED

- Dr. Steven Eli Posner. June, 1995. *Nonparametric Estimation, Regression, and Prediction, Under Minimal Regularity Conditions.* Currently with Goldman Sachs.

- Prof. Yap-Peng Tan (co-supervised with P. Ramadge). June, 1997.
  *Digital Video Analysis and Manipulation.* Currently with the Department of Electrical and Electronic Engineering, Nanyang Technological University, Singapore.

- Dr. Karthik Visweswariah (co-supervised with S. Verdú). Sept., 1999.
  *Topics in the Analysis of Universal Compression Algorithms.* Currently with IBM India Research Lab, Bangalore, India.

- Dr. Sathyakama Sandilya. Nov., 2000.
  *Topics in Nonparametric Statistics.* Currently with Bank of America Merrill Lynch.

- Prof. Richard Radke (co-advised with P. Ramadge). June, 2001.
  *Estimation Problems in Digital Video.* Currently with the Department of Electrical and Computer Engineering, RPI.

- Dr. Abraham George (ORFE student, co-advised with W. Powell). September, 2005. Currently with Macrosoft Inc.

- Dr. Alexander Reznik (co-advised with S. Verdú). August, 2005.
  *New Results in Network Information Theory.* Currently with InterDigital Communications Corporation.

- Dr. Chih-Chun Wang (co-advised with H.V. Poor). August, 2005.
  *Side Information in Bandit Problems and Low-Density Parity-Check Codes for Non-Symmetric Channels.* Currently with Department of Electrical and Computer Engineering, Purdue University.

- Dr. Haixiao Cai (co-advised with S. Verdú). September, 2005.
  *Universal Estimation of Information Measures for Finite-alphabet Sources.* Currently with Concordia Funds.

- Dr. Joel Predd (co-advised with H.V. Poor). June, 2006.
  *Topics in Distributed Inference.* Currently with RAND Corporation, Pittsburgh, PA.

- Dr. Sung-Hyun Son (co-advised with S.C. Schwartz). September, 2006.
  *Efficient Algorithms for Wireless Sensor & Satellite Communication Networks.* Currently with MIT Lincoln Laboratory, Lexington, MA.

- Dr. Aurelie Lozano. September, 2007.
  *Asymptotics of Boosting, Greedy Learning Algorithms, and Wireless Networks.* Currently with IBM T.J. Watson Research Center.

- Dr. Qing Wang (co-advised with S. Verdú). September, 2008.
  *Universal Divergence Estimators for Continuous-Alphabet Sources.* Currently with Credit Suisse.

- Dr. Aman Jain (co-advised with S. Verdú). August, 2010.
  *Energy Efficiency in Wireless Networks.* Currently with Goldman Sachs.

- Dr. Haipeng Zheng (co-advised with H.V. Poor). June, 2011.
  *Distributed Learning: Regression on Attribute-Distributed Data and Consensus Clustering.* Currently with Bank of America Merrill Lynch.

- Dr. Guanchun (Arvid) Wang (co-advised with H.V. Poor). July, 2011.
  *Topics in Probabilistic Judgment Aggregation.* Currently founding start-up company in China.

- Dr. Jieqi Yu (co-advised with H.V. Poor). June, 2012.
  *New Approaches to Reconstructing Geometric Models from Noisy Measurements.* Currently with Facebook.

## CURRENT PH.D. STUDENTS

- Tiance Wang (co-advising with P. Cuff).
- Shang Shang (co-advising with P. Cuff).
- Zhuo Zhang.

## MASTER'S STUDENTS

- Shinichi Kozu. M.S. May 1993. Joined NEC, Japan.
- Song Wang (co-supervised with B. Liu). M.S., June 1995. Joined Data Physics Corporation.
- Daniel Newman. M.S., June 1995. Joined ViaSat.
- Qingyi Zhang (co-supervised with P. Ramadge). M.S., November 2000.
- Robert Miller (co-supervised with P. Ramadge). M.S., August 2001. Joined Booz-Allen-Hamilton.

## GRADUATE ACADEMIC ADVISOR

For first year ISS students:

- Minerva Yeung '92-'93
- Andrew McKellips 93-'94
- Jei Gui '95-'96
- Xin Li '96-'97
- Boonchai Sriponpaew '97-'98
- Husheng Li '00-'01
- Sung-Hyun Son '01-'02
- Qiang Huang '01-'02
- Senem Velipasalar '02-'03
- Lan Dong '03-'04
- Jing Xiong '05-'06
- Haipeng Zheng '06-'07
- Alex Lorbert '07-'08
- Joe Hamburg '07-'08
- Sreechakra Goparaju '08-'09
- Si Chen, '11-'12
- Mehmet Basbug, '11-'12

**THESIS READER**

1. Wai-Man Lam (advisor: A. Reibman), May '92.

2. Kostantinos Diamantaras (advisor: S.Y. Kung), June '92.

3. Mark Goudreau (advisor: S.Y. Kung), May '93.

4. William Lynch (advisor: B. Liu, A. Reibman), May '93

5. Peyman Milanfar, a Ph.D. student of Prof. A. Willsky at M.I.T., June '93.

6. Sridhar Vembu (advisor: S. Verdú), Mar. '94.

7. Pushpak Bhattacharyya, a Ph.D. student at I.I.T., Bombay, Mar. '94.

8. Jung-Woo Lee (advisor: B. Dickinson), April '94.

9. Robert Crow (advisor: S. Schwartz), June '94.

10. Ellen Farrey (advisor: D. Dickinson), Aug. '94.

11. Nigel Lee (advisor: S. Schwartz), Nov. '94.

12. Wei Ding (advisor: B. Liu), April '95.

13. Charles Horn (advisor: P. Ramadge), June '95.

14. Wee Sun Lee, Ph.D. student at Australian National University, April '96.

15. Minerva Yeung (advisor: B. Liu), July, '96.

16. Tsungnan Lin (advisor: S.Y. Kung), Sept. '96.

17. Shang-Hung Lin (advisor: S.Y. Kung), Sept. '96.

18. Wenjun Zeng (advisor: B. Liu), April '97.

19. Yun-Ting (Claire) Lin (advisor: S.Y. Kung), Dec. '97.

20. Andrew McKellips (advisor: S. Verdú), July '98.

21. Richard Bang (advisor: S.C. Schwartz), Sept. '98.

22. R.S. Bichkar, Ph.D. student at IIT, Kharagpur, India, April '99.

23. Rajesh Sundaresan (advisor: S. Verdú), Aug. '99.

24. Jan Bajcsy (advisor: H. Kobayashi), Oct. '99.

25. Min Wu (advisor: B. Liu), April '01.

26. Pradeepa Yahampath, a Ph.D. student at Univ. of Manitoba, Aug. '01.

27. Arun Marar, ORFE student (advisor: W. Powell), Jan. '02.

28. Yingwei Yao (advisor: H.V. Poor), Aug. '02.

29. Shalinee Kishore (advisor: H.V. Poor and S.C. Schwartz), Oct. '02.

30. Wenmiao Lu, M.S. student at Nanyang Technological University, Singapore, Dec. '02.

31. Sudharman Jayaweera (advisor: H.V. Poor), Dec. '02.

32. Ying Zhu (advisor: S.C. Schwartz), Mar. '03.

33. Uri Erez, Ph.D. student at Tel-Aviv University, May '03.

34. Vitali Zagorodnov (advisor: P.J. Ramadge), Aug. '03.

35. Li Chen (advisor: H.V. Poor), July '04.

36. Erhan Bayraktar (advisor: H.V. Poor), July '04.

37. Mustafa Gursoy (advisor: H.V. Poor and S. Verdú), July '04.

38. Tiehan Lv (advisor: S.Y. Kung), July '04.

39. Alex Ihler, Ph.D. student at M.I.T., Feb. '05.

40. Mert Sabuncu (advisor: P. Ramadge), June '06.

41. Senem Velipasalar (advisor: W. Wolf), Sept. '06.

42. Batur Bicer, ORFE student (advisor: J. Mulvey), Sept. '06.

43. Lan Dong (advisor: S.C. Schwartz), Aug. '08.

44. Ankit Gupta (advisor: S. Verdú), July '09.

45. Bryan Conroy (advisor: P. Ramadge), Sep. '10.

46. Yongxin Xi (advisor: P. Ramadge), June '11.

47. Yihong Wu (advisor: S. Verdú), July '11.

48. Jae Ho Kim (advisor: W. Powell), Sep. '11.

49. Zhen (James) Xiang (advisor: P. Ramadge), May '12.

50. Lorne Applebaum (advisor: R. Calderbank), July '12.

51. Alexander Lorbert (advisor: P. Ramadge), Sep. '12.


## UNDERGRADUATE ACADEMIC ADVISING

- Academic Advisor for Class of 1995 from Spring '92 to Spring '95.
- Freshman Advisor, September, 1996 (Class of 2000).
- Freshman Advisor, September, 1997 (Class of 2001).
- Academic Advisor for Class of 2002, from Spring '99 to Spring '02.
- Freshman Advisor, September, 2002 (Class of 2006).
- Academic Advisor for two students in Class of 2003, from Spring '00 to Spring '03.


## UNDERGRADUATE RESEARCH ADVISEES

**Fall '91**: Stephen Lin, Co-advisor (with Bede Liu) for Nelson Chang, Tom Chang, Marc Erickson, Susan Kim, Brian Loomis

**Spring '92:** Nelson Chang, Stewart Taylor, Judy Pillay
Co-advisor (with Bede Liu) for Lee An, Chris Guarriello,
Michael Marucheck, Edward Niu, Wael Sinno, Lirenn Tsai

**Fall '92:** Daniel Dodd, John Paz
Co-advisor (with Bede Liu) for Warren Chain, Keith Frazier,
Jesse Lerman, Wael Sinno, Ravi Srinivasan, David Sullivan, Jason Wang

**Spring '93:** Jessie Lerman, Co-advisor (with Wayne Wolf) for Daniel Dodd,
Co-advisor (with Bede Liu) for Ravi Srinivasan

**Summer '93:** Research supervisor for Samuel Rosa of Staten Island College
as part of Princeton University Title IX Program.

**Fall '93:** Jesse Lerman, Co-advisor (with Peter Ramadge) for Rozaimi Ghani,
Greg Moyer, Deepti Panchawagh

**Spring '94:** Jessie Lerman, Co-advisor (with Peter Ramadge) for Thomas Watson,
Chad Peterman, Rozaimi Ghani, Paul Riskind

**Fall '94:** Co-advisor (with Peter Ramadge) for Thomas Watson,

M. Shawn Mendelovich, Prisdha Dharma, Martin Sawicki

**Spring '95:** Co-advisor (with Peter Ramadge) for Thomas Watson,
M. Shawn Mendelovich, Martin Sawicki
Co-advisor (with A. Wolfe) Andrew Wen, Peter Kovac, Davyd Ramirez

**Fall '95:** Co-advisor (with Peter Ramadge) for Adam Mersereau, Drew Sauer,
Sameet Mehta, Raj De Datta, Sanjeev Ramabhadran, Glenn Kashan

**Spring '96:** Adam Mersereau
Co-advisor (with P. Ramadge) for Drew Sauer, Glenn Kashan

**Fall '96:** Co-advisor (with P. Ramadge) for Sal Desiano, Swati Dutta-Roy,
Mike Madden, Jessica Eden Miller

**Spring '97:** Adam Mersereau
Co-advisor (with P. Ramadge) for Sal Desiano

**Summer '97:** Co-advisor (with P. Ramadge, S. Schwartz as part of Princeton
Summer Institute) for Hubie Chen (Stanford University),
Kevin Chou (Cooper Union)

**Fall '99:** Co-advisor (with P. Ramadge) for Michael Lindahl,
Co-advisor (with W. Wolf) for George Nyako

**Spring '00:** Dave Kulansky, Josh Model.

**Fall '01:** Co-advisor (with H.V. Poor) for Andrew Lookingbill, Sean McCormick,
Andrew Morabito, Eric Carty-Fickes, Christian Garcia

**Spring '02:** Co-advisor (with H.V. Poor) for Adam Yoxtheimer, Dan Usas

**Fall '02:** David Bradley, Co-advisor (with P. Bogucki) for Brett Antonides,
Co-advisor (with R. Stengel) for David Lieb, Mark Siano,
Co-advisor (with H.V. Poor) for Ali Kamaliddin (exchange student from Oxford)

**Spring '03:** David Bradley, Co-advisor (with P. Bogucki) for Brett Antonides,
Co-advisor (with H.V. Poor) for Ali Kamaliddin (exchange student from Oxford)

**Fall '04:** Melissa Chen, Jennifer Huang, Emily Moxley, Thomas Zychinski

**Fall '06:** Arthur Shum
Co-advisor (with C. Rowley) for Charles Clarkson, Alex Limpaecher

**Spring '07:** Co-advisor (with C. Rowley) for Charles Clarkson

**Fall '07:** Jennifer Howard

**Spring '09:** Co-advisor (with N. Leonard) for Jennifer Howard, Nathan Bickford

**Fall '09:** David Benjamin, Eric Cohen, W. Nicholas Greene

**Summer '10:** Co-advisor (with P. Cuff) for Hamza Aftab, Nevin Raj (student at Harvard)

**Fall '11:** Kanika Pasricha

# SERVICE AND PROFESSIONAL ACTIVITIES

## DEPARTMENTAL SERVICE

- Information Sciences and Systems Seminars (Spring 1992 to Fall 1994)
- Undergraduate Advisor for ISS Class of 1995 (Spring 1992 to Spring 1995)
- Coordinated Communications and Signal Processing General Exam, Fall 1992
- Undergraduate Education Committee (Fall 1992 to Fall 1995)
- Computer Policy Committee (Spring 1993 to Spring 1995)
- Chair of Undergraduate Education Committee (Spring 1996 to Fall 1997)
- Freshman Advisor, September, 1996 (Class of 2000).
- Coordinated Communications and Signal Processing General Exam, Spring 1997
- Freshman Advisor, September, 1997 (Class of 2001).
- Academic advisor for Class of 2002, from Spring 1999 to 2002.
- ABET retreat with School of Engineering and Applied Science, Spring 1999.
- Departmental ABET coordinator (with B. Dickinson), 1999-2003
- Undergraduate Curriculum Committee, 2000 - 2002.
- Undergraduate Laboratory Committee, 2000 - 2002.
- Space and Infrastructure Committee, 2002.
- Undergraduate Program Committee, 2002 to 2006.
- Department Hiring Committee, 2007-2008
- General Exam Committee, 2008-2009.
- Hiring Committee for Department Manager, Fall 2009.
- Department Hiring Committee, 2009-2010.
- Graduate Program Committee, 2010-2011.
- Department Executive Committee, 2011-2012.
- IEEE Faculty Representative, 2002 to present.

## SEAS AND UNIVERSITY SERVICE

- Search Committee for Assistant Dean of Multicultural Affairs, Spring 1993
- Faculty Fellow at Forbes College, Fall 1992 to 2004
- Undergraduate Life Committee, 1998 - 1999
- Seminar/short course, for Engineering Council, Princeton, NJ "Introduction to LaTeX", Dec. 5, 2001.
- Discussion Leader, English Language Program, Princeton University, March 11, 2002.
- School of Engineering and Applied Science ABET Committee, 2002 to 2005
- Committee on Discipline, Fall 2002 to Spring 2004
- Faculty Fellow, Charter Club, 2002 to 2004
- Associate Dean for Academic Affairs, July 1, 2003 to 2005.
- Strategic Planning Committee, School of Engineering & Applied Science, April 2003 to 2004.

- Chair, Ad-Hoc Committee on SEAS Computing Requirement, 2003.
- Co-chair (with K. Vanderlick), SEAS MEng Program, July 1, 2003 to 2004.
- Panelist, Undergraduate Research Symposium, April 3, 2004.
- Chair, Search committee for Associate Dean for Graduate Affairs, Summer 2004.
- University Middle States Review meeting, April 26, 2004.
- Participant, Panel Review, Office of Research and Project Administration, Oct. 13, 2004.
- Participant, Widmeyer Communications initial research interview for the Undergraduate Admission Office, Nov. 30, 2004.
- Organized/Moderated panel on "Engineering for a Better World" for Alumni Leadership Council, Oct. 22, 2004.
- Panelist on "Campus Life Leadership: Residential Life" for Women in Leadership Event, sponsored by development Office, Feb. 4, 2005.
- Review committee for Dean of Undergraduate Students, March 2005.
- Faculty Panelist for Admission Office for April Hosting, April 15, 2005.
- 4-year College Brainstorming group, Summer 2005.
- Faculty Panelist for Admission Office for April Hosting, April 21, 2006.
- Special Ad-Hoc Committee for Dean of the College and Office of Admission, June 2006.
- Orientation to Residential Colleges for new staff from Office of Admission, Aug. 21, 2006.
- University Dining Committee, Fall 2005 - Spring 2006.
- Search Committee for Dean of Religious Life, Spring 2007.
- Reappointment review for Director of University Health Services, Feb. 2007.
- Faculty Panelist for Admission Office for April Hosting, April 13, 2007.
- Core Group for Alcohol Coalition, Fall 2007.
- Founding Co-Chair (with Agatha Offorjebe '09), Alcohol Coalition Committee, Fall 2007 - Spring 2008.
- Reappointment review for Director of Athletics, 2008.
- Reappointment review for Executive Vice President, 2008.
- Faculty Panelist for Admission Office for April Hosting, April 11, 2008.
- Presentation on Butler College for Development Office, Class of 1967, Oct. 25, 2008.
- McGraw Center External Review Committee meeting, Dec. 7, 2008.
- Healthier Princeton Advisory Board, Spring 2006 - 2009.
- Interview committee for McGraw Center Director, Spring 2009.
- Chair of committee to review Neuroscience Proposals, SEAS, Spring 2009.
- Presentation for Development Office, "Teaching Broadly", July 21, 2009.
- Interview committee for Director of Counseling and Psychological Services, Summer 2009.
- Master of Ceremonies, new Butler College facilities dedication, Sept. 24, 2009.
- Class of 1940 dedication for new Butler College Memorial Lounge and Courtyard, Oct. 3, 2009.
- Participant, "Coming Back and Moving Forward," Association of Black Princeton Alumni, Oct. 23, 2009.
- Interview committee for Director of Public Safety, Oct. 2009.
- Workshop leader, lunch workshop for post-docs on academic job search and interviews, Council on Science and Technology, Nov. 19, 2009.

- Speaker for Development Office, Class of 1940 Luncheon, Nov. 20, 2009.
- Search Committee for Senior Associate Director of Athletics (Compliance and Campus Affairs), Feb. 2010.
- Bogle Hall Dedication, Butler College, April 9, 2010.
- Interview candidates for Council on Science and Technology professional specialists, Oct. 2010.
- Trustee Meeting, Grounds and Building Committee, Butler post-occupancy review, Nov. 19, 2010.
- Working group to review pre-orientation activities, Oct. 2010 - Jan. 2011.
- Yoseloff Hall Dedication, Butler College, May 20, 2011.
- Class of 1976 Hall Dedication, Butler College, May 27, 2011.
- Interview candidates for Associate Dean of Religious Life, June 2011.
- Interview candidates for Director of Pace Center, Nov. 2011.
- Trustee Meeting, Academic Affairs Committee, graduate programs, Nov. 19, 2011.
- Cognitive Science Program Committee, Fall 1992 to present.
- Frist Campus Center Advisory Board, Spring 2005 - present.
- Robotics and Intelligent Systems Program Committee, Spring 1993 to present.
- Engineering Management Systems Certificate Program Committee, 2006 - present.
- Transportation Systems Program Committee, Fall 1993 to present.
- Alcohol Coalition Committee, Summer 2008 - present.
- Undergraduate Life Committee, Fall 2008 - Spring 2011.
- Public Safety Advisory Committee, 2010 - present.
- National College Health Improvement Project (NCHIP), Learning Collaborative on High-Risk Drinking, 2011-2012.
- Academic Athletic Fellow, Football team, 2005 - present.
- Facutly Fellow, Butler College, 2012 - present.

## PROFESSIONAL LEADERSHIP, SERVICE, AND OTHER ACTIVITIES

### Advisory Councils/Boards
- **Engineering Advisory Council** for School of Engineering, Clarkson University, August 2003 to 2004.
- **Engineering Leadership Council** for School of Engineering, Clarkson University, August 2004 to present.
- **Advisory Board**, Convexus Advisors, San Francisco, CA, September 2006 to May 2007.
- **Technical Advisory Board**, SightLogix, Princeton, NJ, 2004 to present.
- **Advisory Board**, Preceptor Associates, Princeton, NJ, May 2005 to 2009.
- **Advisory Board**, Sterraclimb, Princeton, NJ, 2010 to present.
- **Advisory Board**, Mindprint PLUS, Princeton, NJ, 2012 - present.
- **Faculty Advisory Committee**, Labyrinth Books, 2008 - present.
- **Board of Trustees**, Princeton University Press, 2011 - present.

### Editorial Boards, Editorial Activities

- **BBS Associate** for the journal Brain and Behavioral Sciences (Spring '92 to present)
- **Associate Editor** for *IEEE Transactions on Information Theory*, 1999.
- **Editorial Board** for *Foundations and Trends in Communications and Information Theory*, June 2003 to present.
- **Guest Editor**, special issue of *Signal Processing Magazine* on Signal Processing for Financial Applications, September, 2011.
- **Guest Editor**, for special issue of *Journal on Selected Topics in Signal Processing* on Signal Processing Methods in Finance and Electronic Trading, August, 2012.

### Consulting and Visiting Positions

- **Expert Witness**, Omniplanar Inc. in case of UPS vs. Omniplanar Inc. involving machine-readable labels. Spent approximately two weeks preparing expert witness report during May and June, 1992 Spent approximately two weeks for depositions during May through August, 1993.
- **Visiting Research Fellow**, Australian National University, January 1996.
- **Technical Consultant**, Susquehanna International Group, 1997-2001. Regular consultant involving quantitative research, statistical arbitrage, and analysis of firm-wide stock trading.
- **Visiting Researcher**, Flarion Technologies, Inc., Summer 2001. Investigated downlink packet scheduling with quality-of-service requirements and throughput of wireless networks.
- **Chief Scientific Consultant**, Convexus Advisors, Aug. 2006 - May 2007. Regular consultant involving algorithmic trading, quantitative research, statistical arbitrage, pattern recognition, machine learning for a quantitative hedge fund.
- **Expert Witness**, Kirkland and Ellis, LLP, involving video compression. March 2009.

### Conference and Workshop Organizer

- **Co-organizer** (with M. Orchard) for 30th Conference on Information Sciences and Systems (CISS '96), March 1996.
- **Co-organizer** (with K. Vanderlick) for 11 SEAS Strategic Planning Workshops, Princeton University. Fall 2003.
- **Co-organizer** (with M. Chiang) for 38th Conference on Information Sciences and Systems (CISS '04), March 2004.
- **Co-organizer** (with A. Offorjebe) for 3 workshops on High-Risk Drinking, Princeton University, Spring 2008.
- **Co-organizer** (with J. Finnie, et al.) for workshop with 18 colleges and universities on "High-Risk Drinking: Catalyzing a Culture Change", Princeton University, Spring 2009.

### Conference/Workshop Program Committees, Session Chair, etc.

- **Session Chair**, Conference on Information Sciences and Systems, March 1992.
- **Program Committee**, IEEE Regional Controls Conference, June, 1994.
- **Publications Chair**, International Symposium on Information Theory 1998.
- **Program Committee**, Symposium on Advances in System Theory, Oct., 1999.
- **Session Chair**, Financial Engineering and Insurance Workshop, Princeton University, November 1999.
- **Program Committee**, International Symposium on Information Theory 2000.
- **Session Chair**, Conference on Information Sciences and Systems, March 2000.
- **Session Chair**, Conference on Information Sciences and Systems, March 2002.

- **Program Committee**, International Symposium on Information Theory 2002.
- **Program Committee**, International Symposium on Information Theory 2004.
- **Program Committee**, Student Papers Contest, Sarnoff Symposium, 2006.
- **Session Chair**, International Symposium on Information Theory 2006, July 2006.
- **Program Committee**, International Symposium on Information Theory 2008.
- **Session Chair**, Kickoff Meeting, NSF Center on the Science of Information, Chicago, IL, Oct 6-7, 2010.
- **Program Committee**, International Symposium on Information Theory 2010.
- **Program Committee**, Machine Learning for Signal Processing, 2010.
- **Session Chair**, "The Economic Challenge", Princeton University, Dec 5-6, 2011.
- **Session Chair**, "Quantitative Trading Conference", Princeton University, March 31, 2012.

**Invited Workshops/Panelists, Panel Reviews**

- **Invited Panelist**, IROS '92 (International Conference on Intelligent Robots and Systems, Raleigh, NC). Panel discussion on "Major Issues/Directions for Machine Learning," for a Workshop on *Dynamic World Autonomous Systems*, July 7-10, 1992.
- **Invited Participant**, ARO Workshop on Machine Intelligence, Feb. 1993.
- **Invited Panelist**, NSF Review Panel for Research Initiation Awards, April 1993.
- **Invited Panelist**, NSF Review Panel for CAREERS Awards, Jan. 1995.
- **Invited Participant**, NSF Workshop on Learning and Adaptation in Natural and Artificial Systems, Washington, D.C., Nov. 13-14, 1995.
- **Invited Panelist**, "The Business of Research", Fourth Annual LIDS Student Conference, MIT, Cambridge, MA, Jan. 28-29, 1999.
- **Invited Panelist**, NSF Review Panel for Learning and Intelligent Systems, Jan., 1999.
- **Invited Panelist**, Workshop on Communications and Network Technology for Distributed Robotics, Draper Labs, Cambridge, MA, May 21, 2002.
- **Invited Panelist**, Wireless Communications and Networking Conference, "The Business and Technical Case for Sensor Networks", New Orleans, March 17-20, 2003.
- **Invited Panelist**, NSF Review Panel for Information Technology Research, April, 2003.
- **Invited Keynote Speaker and Participant**, Strategic Planning Workshop, "Optimizing the Harvey Mudd College Experience", October 20, 2006.
- **Invited Panelist**, Battle of the Quants, New York, NY, Feb. 7, 2007.
- **Invited Panelist**, Panel discussion on "What Structures Can Support the Development of the Whole Student?", Leadership Coalition President's Symposium, Bringing Theory to Practice, Washington, DC, Nov. 10-11, 2008.
- **Invited Speaker and Panelist**, Panel on Estimation, Inference, and Learning, Symposium on Paths Ahead in the Science of Information and Decision Systems, MIT, Oct. 12-14, 2009.
- **Invited Keynote Speaker**, "Science of Information Meets the Liberal Arts," Workshop on Information, Bryn Mawr College, Bryn Mawr, PA, Oct. 26, 2012.

**Invited Book Reviewer**

- **Invited Reviewer**, book draft *Discrete Stochastic Processes* by R. Gallager for Kluwer Academic Publishers, May, 1994.
- **Invited Reviewer**, book draft *Learning and Neural Networks* by M. Vidyasagar for Springer-Verlag, Sept., 1995.

- **Invited Reviewer**, book draft *Structure and Interpretation of Signals and Systems* by E. Lee and P. Varaiya for Academic Press, 2000.
- **Invited Reviewer**, book proposal *Learning, Adaptation, and Decision Making with Finite Data* by V. Saligrama, M. Dahleh, S.K. Mitter for Princeton University Press, 2001.
- **Invited Reviewer**, *The Theory of Probability: Explorations and Applications* by S. Venkatesh, Cambridge University Press, 2012.

**Paper and Grant Reviews**
- Ongoing service as reviewer for a number of grant agencies, journals, and conferences.

**Miscellaneous**
- **IT Society Liaison** to the IEEE Press, 1998-2000.
- **Princeton University Liaison** for IEEE Central Jersey Chapter, 2002 to present.
- Committee to interview faculty candidates for KAUST, spring 2010.

## SEMINARS, PRESENTATIONS, WORKSHOPS, CONFERENCES

1. Seminar, "Extensions of PAC Learning for Applications to Signal Processing and Geometric Reconstruction," M.I.T., May, 1991.

2. Presentation at CISS'92, Princeton University, "A Paradigm For Class Identification Problems," March 19, 1992.

3. Presentation at IBM, Thomas J. Watson Research Center, Hawthorne, NY, "Proposal to Study Theoretical Foundations of Handwriting Production and Recognition," March 27, 1992.

4. Invited Seminar for Cognitive Science Seminar Series, Princeton Univ., "Formal Models of Machine Learning," April 20, 1992.

5. Presentation for NTT Visit, Princeton Univ., "Formal Models for Machine Learning," April 29, 1992.

6. Presentation Corporate Affiliates Program, Princeton University, "Formal Models for Machine Learning," May 5, 1992.

7. Attendee at NEC Workshop on Computational Learning and Cognition, May 27-28, 1992.

8. Invited panelist/presentation at IROS '92 (International Conference on Intelligent Robots and Systems, Raleigh, NC), As part of a panel discussion for a Workshop on *Dynamic World Autonomous Systems*, "Major Issues/Directions for Machine Learning," July 7-10, 1992.

9. Presentation at COLT'92, University of Pittsburgh, "Learning With Generalized Examples and an Application to Stochastic Geometry," July 27-29, 1992.

10. Presentation for NSF Infrastructure Site Visit, Princeton Univ., "Some Ongoing Work/ Directions in Image Understanding and Machine Learning," July 31, 1992.

11. Invited Seminar, Siemens Corporate Research, Princeton, NJ., "Tomographic and Convex Set Reconstruction Techniques Applied to Laser Radar Data," August 6, 1992.

12. Invited participant for Workshop on Machine Intelligence sponsored by ARO, University of Pennsylvania, Feb. 9-10, 1993.

13. Presentation as part of Final Workshop for Electronic Eye Study, Cologne, Germany, "Research Issues in Learning and Adaptation for an Electronic Eye," March 16-17, 1993.

14. Invited presentation, CISS'93, Johns Hopkins Univ., "Applications of PAC Learning to Problems in Geometric Reconstruction," March 24, 1993.

15. Presentation for meeting of Institute for Transportation Engineers as part of presentation of ongoing work at Princeton on Intelligent Transportation Systems, "Image Processing/Computer Vision and Learning/Adaptation in Intelligent Transportation Systems," April 1, 1993.

16. Presentation of ongoing work at Princeton on Intelligent Transportation Systems for Dr. Ray Brandinger, Executive Director of the New Jersey Commission on Science and Technology. "Image Processing/Computer Vision and Learning/Adaptation in Intelligent Transportation Systems," April 14, 1993.

17. Invited Seminar and relations/recruiting at the Dept. of Electrical and Computer Engineering, University of Puerto Rico, Mayaguez. "Some Recent Work in Image Processing at Princeton University," May 13, 1993.

18. Presentation (with Bede Liu, Hisashi Kobayashi) of some work in image processing (video coding, chain coding) and ATM networks for Werner Wedham, et al. from Sharp Corporation, June 2, 1993.

19. Presentation at IVHS Day at Siemens Corporate Research. Participants from Siemens Corporate Research, Siemens Automotive, and Princeton University. "Image Processing/Computer Vision and Learning/Adaptation in Intelligent Transportation Systems," June 8, 1993.

20. Presentation at Annual Workshop on Computational Learning Theory, Santa Cruz, CA. "On Probably Correct Classification of Concepts," July 26, 1993.

21. Presentation at Annual Workshop on Computational Learning Theory, Santa Cruz, CA. "On-line Learning of Functions of Bounded Variation Under Various Sampling Schemes," July 28, 1993.

22. Presentation at 31st Annual Allerton Conference on Communication, Control, and Computation, Univ. of Illinois, "On Bandit Problems With Side Observations and Learnability," Sept. 29, 1993.

23. Invited participant for NASA-ARO Workshop on Formal Models for Intelligent Control, M.I.T., Sept. 30 - Oct. 2, 1993.

24. Invited Seminar in Statistics Seminar Series, Princeton University, "Stochastic Approximation Under Arbitrary Disturbances," Nov. 17, 1993.

25. Presentation at 13th Conference on Foundations of Software Technology and Theoretical Computer Science, I.I.T. Bombay, India, "On Local Versus Non-local Computation of Length of Digitized Curves," Dec. 14, 1993.

26. Invited participant and presentation at the Silver Jubilee Workshop on Computing and Intelligent Systems, I.I.Sc. Bangalore, India, "Stochastic Approximation Under Arbitrary Disturbances," Dec. 21, 1993.

27. Presentation at Prospective Graduate Student Recruiting Weekend, Dept. of Electrical Engineering, Princeton University, March 25, 1994.

28. Invited Seminar, Department of Electrical Engineering, Technion, Haifa, Israel, "Nearest Neighbor Estimation Under Arbitrary Sampling," June 16, 1994.

29. Presentation at 1994 IEEE International Symposium on Information Theory, "Learning Decision Rules for Pattern Classification Under a Family of Probability Measures," June 27, 1994

30. Presentation at SIAM Annual Meeting, "Recovering Convergence Results for Stochastic Approximation from Persistently Disturbing Conditions," July 27, 1994.

31. Invited presentation at SPIE Conference on Neural and Stochastic Methods in Image and Signal Processing, "Variational Versus Markov Random Field Methods for Image Segmentation," July 28, 1994.

32. Invited Presentation to Freshman Engineers in Class of 1998 as part of Merck Colloquium Series, "Image Processing: A Booming Technology," November 6, 1994.

33. Presentation as part of Workshop for Electronic Eye Project, Siemens Corporate Research, Princeton, "Motion Detection and Tracking," November 28, 1994.

34. Presentation at 1995 IEEE Information Theory Workshop "Nonparametric Regression Estimation for Arbitrary Processes," Rydzyna, Poland, June 25-29, 1995.

35. Presentation at 1995 IEEE International Symposium on Information Theory, "Existence of Strongly Consistent Rules for Estimation and Classification," Whistler, Canada, Sept. 18-22, 1995.

36. Participant in Workshop on Control Using Logic-Based Switching, Block Island, RI, Sept. 30 - Oct. 1, 1995.

37. Presentation at 1995 Allerton Conference, "An Overview of Some Results on Nonparametric Estimation for Arbitrary Processes," Univ. of Illinois, Oct. 4-6, 1995.

38. Invited Participant in NSF Workshop on Learning and Adaptation in Natural and Artificial Systems, Washington, D.C., Nov. 13-14, 1995.

39. Invited Seminar, "Nearest Neighbor Estimation Under Arbitrary Sampling," Department of Mathematics, Center for Systems and Control, Rutgers University, New Brunswick, NJ, Oct. 13, 1995.

40. Participant in Workshop on Verification and Control of Hybrid Systems, Rutgers University, Oct. 22-25, 1995.

41. Presentation at 1995 IEEE Conference on Decision and Control, "Universal Prediction of Nonlinear Systems," New Orleans, LA, Dec. 13-15, 1995.

42. Presentation at 1995 IEEE Conference on Decision and Control, "Necessary and Sufficient Conditions for the Convergence of Stochastic Approximation Algorithms Under Arbitrary Disturbances," New Orleans, LA, Dec. 13-15, 1995.

43. Presentation at 1995 IEEE Conference on Decision and Control, "On the Memory Requirements of Convergent On-line Decision Rules," New Orleans, LA, Dec. 13-15, 1995.

44. Invited Seminar, "Nonparametric Regression Estimation Under for Arbitrary Processes and Universal Output Prediction," Department of Systems Engineering, Australian National University, Canberra, Australia, Jan. 18, 1996.

45. Invited Seminar, "Nonparametric Regression Estimation Under for Arbitrary Processes and Universal Output Prediction," Department of Electrical Engineering, Technical University of Budapest, Budapest, Hungary, Mar. 6, 1996.

46. Invited Seminar, "Nonparametric Regression Estimation Under for Arbitrary Processes and Universal Output Prediction," Department of Computer Science, Concordia University, Montreal, Canada, Mar. 13, 1996.

47. Invited Seminar, "Nonparametric Regression Estimation Under for Arbitrary Processes and Universal Output Prediction," Department of Electrical Engineering, McGill University, Montreal, Canada, Mar. 14, 1996.

48. Seminar, "Some New Techniques in Video Analysis and Manipulation," Department of Mathematics, State University of New York at Potsdam, Potsdam, NY, Mar. 15, 1996.

49. Invited Seminar, "Nonparametric Regression Estimation Under for Arbitrary Processes and Universal Output Prediction," Department of Electrical Engineering, University of Manitoba, Winnipeg, Canada, May 27, 1996.

50. Invited Seminar, "Some New Techniques in Video Analysis and Manipulation," Department of Electrical Engineering, Purdue University, West Lafayette, IN, May 28, 1996.

51. Seminar, "Nonparametric Regression Estimation Under for Arbitrary Processes and Universal Output Prediction," Department of Electrical Engineering, University of Illinois, Urbana-Champaign, IL, May 30, 1996.

52. Invited Seminar, "Some New Techniques in Video Analysis and Manipulation," Department of Electrical Engineering, University of Illinois, Urbana-Champaign, IL, May 31, 1996.

53. Invited Seminar, "Nonparametric Regression Estimation Under for Arbitrary Processes and Universal Output Prediction," Department of Electrical Engineering, University of Illinois, Urbana-Champaign, IL, Sept. 9, 1996.

54. Invited Seminar, "Nonparametric Regression Estimation Under for Arbitrary Processes and Universal Output Prediction," Laboratory for Information and Decision Systems, M.I.T., Cambridge, MA, Oct. 8, 1996.

55. Participant, Interim Progress Meeting, "Princeton Panorama Project," Intel Corporation, Chandler, AZ, Jan. 18, 1997.

56. Participant, Conference on Mathematical Finance, Institute for Advanced Study, Princeton, NJ, Sept. 26, 1997.

57. Invited Participant, Workshop on Learning, Intelligent, and Hybrid Systems, Bangalore, India, Jan. 4-8, 1998.

58. Participant, International Symposium on Information Theory, Cambridge, MA, Aug. 17-21, 1998.

59. Invited plenary speaker, Fourth Annual LIDS Student Conference, MIT, Cambridge, MA, Jan. 28-29, 1999.

60. Invited Panelist for discussion on "The Business of Research" Fourth Annual LIDS Student Conference, MIT, Cambridge, MA, Jan. 28-29, 1999.

61. Speaker, Corporate Affiliates Program, Dept. of Electrical Engineering, Princeton University, "Some Techniques in Video Analysis and Manipulation", May, 1999.

62. Invited Participant, Symposium on Advances in System Theory, Cambridge, MA, Oct. 15-16, 1999

63. Session chair and participant, Financial Engineering and Insurance Workshop, Princeton University, Nov., 1999.

64. Speaker and Participant, MURI technical planning meeting, MIT, Cambridge, MA, May, 2000.

65. Speaker and Participant, MURI Kickoff Meeting, Army Research Laboratory, Beltsville, MD, July, 2000.

66. Participant, TRAC Meeting, Fort Leavenworth, Kansas, Dec. 1, 2000.

67. Speaker and Participant, MURI technical planning meeting, MIT, Cambridge, MA, March, 2001.

68. Speaker and Participant, MURI Review Meeting, Army Research Laboratory, Beltsville, MD, June, 2001.

69. Seminar, Flarion Technologies, Bedminster, NJ "Downlink Packet Scheduling with QoS Requirements", Sept. 11, 2001.

70. Invited Seminar, sponsored by Engineering Council, Princeton, NJ "Introduction to LaTeX", Dec. 5, 2001.

71. Invited Discussion Leader, "Communicating With Your Head of Course," part of AI Concerns Over Lunch series, English Language Program, Princeton University, March 11, 2002.

72. Invited Seminar, "Throughput of Wireless Networks," Department of Electrical and Computer Engineering, Clarkson University, March 28, 2002.

73. Invited Panelist and Participant, Workshop on Communications and Network Technology for Distributed Robotics, Draper Labs, Cambridge, MA, May 21, 2002.

74. Speaker and Participant, MURI Review Meeting, Army Research Laboratory, Beltsville, MD, June 14, 2002.

75. Participant, Review meeting for Decision-Making Under Uncertainty MURI's, Berkeley/Stanford/Cornell and UCLA/UC Irvine/Illinois, Berkeley, CA, July 16-17, 2002.

76. Invited Seminar, "Throughput Scaling in Wireless and Heterogeneous Networks," Department of Electrical Engineering, Yale University, Feb. 26, 2003.

77. Invited Panelist, Speaker, and Participant, Wireless Communications and Networking Conference, "The Business and Technical Case for Sensor Networks", New Orleans, March 17-20, 2003.

78. Invited Seminar, "Universal Output Prediction for Nonlinear Systems," Department of Mathematics and Department of Electrical and Computer Engineering, Clarkson University, April 3, 2003.

79. Invited Seminar, "Throughput Scaling in Wireless and Heterogeneous Networks," Systems Research Center and Center for Satellite and Hybrid Communications Networks, University of Maryland, May 2, 2003.

80. Speaker, Corporate Affiliates Program, Dept. of Electrical Engineering, Princeton University, "Throughput Scaling in Wireless Networks", May 8, 2003.

81. Invited Seminar, "Throughput Scaling in Wireless and Heterogeneous Networks," Department of Electrical Engineering, University of Colorado, May 19, 2003.

82. Invited Seminar, "Throughput Scaling in Wireless and Heterogeneous Networks," Department of Electrical Engineering, Colorado State University, May 22, 2003.

83. Invited Speaker and Participant, Twelfth Yale Workshop on Adaptive and Learning Systems Yale University, May 28-30, 2003.

84. Speaker, "Distributed Learning, Adaptation, and Coordination in Sensor Networks", Draper Laboratory, IR&D Project Kick-off, July 25, 2003.

85. Invited Panelist, Academic Job Search Workshop, sponsored by McGraw Center for Teaching and Learning and Career Services, Princeton University, Sept. 15, 2003.

86. Invited Speaker, "Engineering at Princeton: Frontiers, Outreach, and Strategic Planning", Princeton University Class of 1940, Annual Dinner, Dec. 4, 2003.

87. Speaker, "Distributed Learning, Adaptation, and Coordination in Sensor Networks", Draper Laboratory, IR&D Project Mid-Year Review, January 16, 2004.

88. Attendee, Program in Computational and Applied Mathematics student conference, Princeton, Mar. 9, 2004.

89. Panelist, panel discussion on undergraduate research, Undergraduate Research Symposium, Princeton, April 3, 2004.

90. Invited Seminar, "Engineering for a Better World", Clarkson University, April 9, 2004.

91. Invited Speaker (with T. Kyle Vanderlick), "Engineering for a Better World", Oxford-Princeton Partnership meeting, April 16, 2004.

92. Invited Speaker (with T. Kyle Vanderlick), "Engineering for a Better World", Princeton University, Development Leadership Council, April 16, 2004.

93. Invited Presentation, "Engineering for a Better World", Clarkson University, Trustee subcommittee meeting, Murray Hill, NJ, June 15, 2004.

94. Participant, International Symposium on Information Theory, Chicago, IL, June 27 - July 2, 2004.

95. Speaker, "Distributed Learning, Adaptation, and Coordination in Sensor Networks", Draper Laboratory, IR&D Project Final Review, July 19, 2004.

96. Organized/Moderated panel on "Engineering for a Better World" for Alumni Leadership Council, Oct. 22, 2004.

97. Participant, IEEE Conference on Decision and Control, Paradise Island, Bahamas, Dec. 13-17, 2004.

98. Participant, Dean's Leadership Council meeting, Clarkson University, Potsdam, NY, Jan. 14-15, 2005.

99. Speaker, "Distributed Learning, Adaptation, and Coordination in Sensor Networks", mid-year review, Draper Laboratory, Cambridge, MA, January 21, 2005.

100. Invited speaker and participant, 13th Yale Workshop on Adaptive and Learning Systems, "Distributed Learning, with Limited Communication", Yale University, New Haven, CT, May 30-June 1, 2005.

101. Speaker, "Distributed Learning, Adaptation, and Coordination in Sensor Networks", final review, Draper Laboratory, Cambridge, MA, July 1, 2005.

102. Participant, Dean's Leadership Council meeting, Clarkson University, Potsdam, NY, Oct. 27-28, 2005.

103. Participant, ARO MURI Final Review, Adelphi, MD, Dec. 2, 2005.

104. Participant, Engineering Leadership Council meeting, Clarkson University, Potsdam, NY, April 13-15, 2006.

105. Invited Seminar, "Distributed Inference: Aggregating Probability Forecasts and Collaborative Regression", MIT, Cambridge, MA, May 4, 2006.

106. Invited Participant, Workshop on Frontiers of Statistics, Princeton University, Princeton, NJ, May 18-20, 2006.

107. Invited Speaker, Workshop on Networked Sensing, Information, and Control, "Distributed Inference in Sensor Networks: Part 1: Aggregating Probability Forecasts", Boston University, Boston, MA, May 24-26, 2006.

108. Speaker, "Signal Correspondence and Distributed Learning and Inference", Office of Naval Research, June 22, 2006.

109. Participant and Session Chair, International Symposium on Information Theory, Seattle, WA, July 9-14, 2006.

110. Participant, Engineering Leadership Council meeting, Clarkson University, Potsdam, NY, Oct. 5-7, 2006.

111. Invited Keynote Speaker and Participant, "Optimizing a University Experience", Strategic Planning Workshop on Optimizing the Harvey Mudd College Experience, Claremont, CA, Oct. 20, 2006.

112. Invited Panelist, Battle of the Quants, New York, NY, Feb. 7, 2007.

113. Invited Seminar, "Distributed Learning in Sensor Networks", Syracuse University, Syracuse, NY, March 28, 2007.

114. Presentation at Kickoff meeting for ONR Grant, "Distributed Learning for Active and Passive Sonar", Office of Naval Research, Arlington, VA, May 17, 2007.

115. Presentation at ARO MURI Kickoff meeting, "Distributed Learning for Dynamic Modeling of 3D Urban Terrain", Rice University, Sept. 10, 2007.

116. Invited respondent, Reliable Reasoning Symposium, Princeton University, Nov. 30, 2007.

117. Center for Networks Science and Application Workshop, Princeton University, Dec. 6, 2007.

118. IBM Security Day, Princeton University, Dec. 7, 2007.

119. Co-organizer, Alcohol Coalition Workshop, "Reasons for High-Risk Drinking and Ways to Address Them", Princeton University, Feb. 15, 2008.

120. Co-organizer, Alcohol Coalition Workshop, "Structures Affecting High-Risk Drinking", Princeton University, Feb. 22, 2008.

121. Co-organizer, Alcohol Coalition Workshop, "Responsibilities Regarding High-Risk Drinking", Princeton University, Feb. 29, 2008.

122. Presentation for ONR Review, "Distributed Learning for Active and Passive Sonar", Office of Naval Research, Arlington, VA, April 22, 2008.

123. Participant, Workshop on Distributed Detection and Estimation, Virginia Tech, Blacksburg, VA, July 15, 2008.

124. Poster presentation for ONR Annual Review, "Distributed Learning for Active and Passive Sonar", University of Washington, Seattle, WA, Aug. 5-7, 2008.

125. Invited panelist, Panel discussion on "What Structures Can Support the Development of the Whole Student?", Leadership Coalition President's Symposium, Bringing Theory to Practice, Washington, DC, Nov. 10-11, 2008.

126. Presentation/discussion on "Learning Theory and Pattern Recognition" at Mercer House, Princeton, NJ, Nov. 14, 2008.

127. Participant, Alcohol Coalition Workshop, "The University's Alcohol Policy and Enforcement: What Works & What Doesn't", Princeton University, Dec. 5, 2008.

128. Co-organizer and participant, Alcohol Coalition Workshop with 18 colleges and universities on "High-Risk Drinking: Catalyzing a Culture Change", Princeton University, April 2-3, 2009.

129. Presentation for ONR Review, "Distributed Learning for Active and Passive Sonar", Office of Naval Research, Arlington, VA, April 30, 2009.

130. Participant, Clarkson University, Engineering Leadership Council meeting, Chicago, IL, April 30 - May 1, 2009.

131. Invited speaker, "Teaching Broadly," Princeton University, Development Office, July 21, 2009.

132. Poster presentation for ONR Annual Review, "Distributed Learning for Active and Passive Sonar," University of Washington, Seattle, WA, Aug. 4-6, 2009.

133. Invited seminar, "Wireless Communications," for students in Center for Mobile Communication Studies (Prof. James Katz, Director), Sept. 11, 2009.

134. Master of ceremonies, New Butler College facilities dedication, Princeton University, Sept. 24, 2009.

135. Participant, Review meeting, ARO MURI on Dynamic Modeling of 3D Urban Terrain," Virginia Tech, Blacksburg, VA, Oct. 19, 2009.

136. Invited speaker and panelist, "Some Possible Paths Ahead in Estimation, Inference, and Learning," symposium on Paths Ahead in the Science of Information and Decision Systems, MIT, Oct. 12-14, 2009.

137. Presentation/discussion on "Learning Theory, Artificial Intelligence, and Epistemology" at Mercer House, Princeton, NJ, Dec. 4, 2009.

138. Invited presentation, "Machine Learning: The Promise of Artificial Intelligence," Princeton Chamber of Commerce, Business Before Business, Mar. 17, 2010.

139. Session Chair, Knowledge Extraction, Kick-off meeting, NSF Science and Technology Center on the Science of Information, Chicago, IL, Oct. 6-7, 2010.

140. Participant, Clarkson University Engineering Leadership Council meeting, Poughkeepsie, NY, April 14-15, 2011.

141. Presentation, "Machine Learning: The Promise of Artificial Intelligence," Princeton Alumni Association, Jacksonville, FL, April 20, 2011.

142. Attendee, TiEcon 2011, Santa Clara, CA, May 13-14, 2011.

143. Invited seminar, "Aggregating Probability Forecasts from Incoherent and Abstaining Experts," Tradeworx, Oct. 25, 2011.

144. Invited speaker, "Teaching Broadly," Annual Giving Parents Fund, Development Office, Princeton University, February 21, 2012.

145. Attendee and Session Chair, "Quantitative Trading Conference," Princeton University, March 31, 2012.

146. Attendee "Workshop on Governing Science," Princeton University, April 13-14, 2012.

147. Participant, Clarkson University, Engineering Leadership Council meeting, Potsdam, NY, Sept. 27-29, 2012.

148. Presentation/discussion on "Voting Theory" at Mercer House, Princeton, NJ, Oct. 12, 2012.

149. Attendee "Princeton Day of Statistics," Princeton, NJ, Oct. 19, 2012.

150. Invited keynote speaker, "Science of Information Meets the Liberal Arts," Workshop on Information, Bryn Mawr College, Bryn Mawr, PA, Oct. 26, 2012.