

Venugopal V. Veeravalli

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EDUCATION

University of Illinois at Urbana-Champaign, Ph.D. in *Electrical Engineering*, October, 1992

Dissertation: *Topics in Decentralized Detection*

Advisors: Prof. H. Vincent Poor and Prof. Tamer Başar

Carnegie-Mellon University, Pittsburgh, PA, M.S. in *Electrical Engineering*, May, 1987

Thesis: *Detection of Digital Signals in Erased Magnetic Disks*

Indian Institute of Technology, Bombay, B. Tech. (B.S.) in *Electrical Engineering*, May, 1985

PROFESSIONAL EXPERIENCE

Henry Magnuski Professor, (2016-present), *University of Illinois at Urbana-Champaign*.

Professor, (2005-present), Department of ECE; also affiliated with Department of Statistics, Coordinated Science Laboratory, and Information Trust Institute, *University of Illinois at Urbana-Champaign*.

Director, (2007-2015), *Illinois Center for Wireless Systems*, University of Illinois at Urbana-Champaign.

Program Director, (2003-2005), CISE/CCF/TF, *National Science Foundation*, Arlington, VA

Associate Professor, (2000-2005), Department of ECE, and Coordinated Science Laboratory, *University of Illinois at Urbana-Champaign*

Visiting Professor, Spring 2009, *IISc Bangalore, India*; Fall 2008, *MIT*, Cambridge, MA

Assistant Professor, (1996-2000), School of Electrical Engineering, *Cornell University*. (Also member of graduate fields of Applied Mathematics and Statistical Science.)

Visiting Assistant Professor, (1994-1996), ECE Department, *Rice University*

Assistant Professor, (1993-1994), EE Department, *City College and Graduate School, CUNY*

Postdoctoral Fellow, (1992-1993), Division of Applied Sciences, *Harvard University*

AWARDS AND HONORS

Henry Magnuski Professorship, University of Illinois at Urbana-Champaign, 2016-.

Abraham Wald Prize in Sequential Analysis, 2016.

IEEE Signal Processing Society Distinguished Lecturer, 2010-2011.

List of Teachers Ranked as Excellent by their Students, University of Illinois, Spring 2007, Fall 2007, Spring 2010, Fall 2010 (two courses), Spring 2012, Fall 2013, Spring 2013, Spring 2014, Spring 2015, Fall 2015, Spring 2016, Spring 2017 (two courses).

IEEE Signal Processing Society Young Author Best Paper Award, 2006 (with Jean-Francois Chamberland) for “Decentralized Detection in Sensor Networks,” (see publication [J27]).

Fellow of the IEEE, 2006, “for contributions to wireless communications and sensor networks.”

Xerox Award for Faculty Research, College of Engineering, Illinois, 2003.

Beckman Associate of the Center for Advanced Study, Illinois, 2002-2003.

Michael Tien Excellence in Teaching Award, College of Engineering, Cornell University, 1999.

PECASE (Presidential Early Career Award for Scientists and Engineers), 1999, to recognize outstanding research in wireless communications and for innovations in teaching. This is “the highest honor bestowed by the U.S. government on outstanding new scientists and engineers who are in the early stages of establishing their independent research careers.”

CAREER Award, National Science Foundation, 1998.

IEEE Browder J. Thompson Prize Award, 1996, an award given to an outstanding paper by authors under the age of 30 selected from all the publications of the IEEE. The award winning paper: “A Sequential Procedure for Multihypothesis Testing” (see publication [J9]).

Institute Silver Medal, IIT, Bombay, 1985.

MEMBERSHIPS

Fellow, *IEEE*, and *IEEE Information Theory, Communications, Signal Processing* societies.

Chair of the Ithaca Section of the IEEE, 1998-2000.

Member, ASEE.

Member, Institute of Mathematical Statistics (IMS)

Member, *Bernoulli* Society

MAJOR CONSULTING ACTIVITIES

Sidley Austin LLP/ Huawei Technologies, expert witness consulting, Chicago, IL 2017, 2018.

Marshall, Gerstein & Borun/Gogo Wireless, expert witness consulting, Chicago, IL, 2012 and 2013.

WilmerHale/Apple, expert witness consulting with deposition experience, Boston, MA, 2011, 2012, 2013 and 2014.

Qualcomm, Inc, San Diego, CA, 2009 and 2010

Bartlit-Beck/3COM, expert witness consulting, Chicago, IL, 2001 and 2002.

Nortel Networks, Richardson, TX. 1995 and 1996.

MAJOR EXTERNAL SERVICE ACTIVITIES

Program Director, (2003-2005), CISE/CCF/TF, *National Science Foundation*, Arlington, VA

Technical Program Committee Co-Chair, *IEEE International Symposium on Information Theory*, Paris, France, 2018.

General Co-Chair, *IEEE International Symposium on Information Theory*, Honolulu, Hawaii, June 2014.

Technical Program Chair, *IEEE Communication Theory Workshop*, Maui, Hawaii, May 2012.

Coorganizer of the *National Academy of Engineering*, 2001 Frontiers of Engineering Conference

Invited Participant in the *National Academy of Engineering*, Frontiers of Engineering Conference, Irvine, CA, September 2000

Member of the Big Data SIG of the *IEEE Signal Processing Society*, 2017 -

Member of the SPTM Technical Committee of the *IEEE Signal Processing Society*, 2011 - 2016.

Member of the Board of Governors of the *IEEE Information Theory Society*, 2004-2007.

Guest Editor, *IEEE JSTSP Special Issue on Learning-Based Decision Making*, October 2013.

Guest Editor, *IEEE JSTSP Special Issue on Anomalous Pattern Discovery*, February 2013.

Guest Editor, *EURASIP Journal on Advances in Signal Processing (JASP) on Wireless Location Estimation and Tracking*, May 2008.

Guest Editor, *IEEE Signal Processing Magazine, Special Issue on Resource-Constrained Signal Processing, Communications, and Networking*, May 2007.

Associate Editor, Detection & Estimation for *IEEE Transactions on Information Theory*, 2000-2004

Associate Editor for *IEEE Transactions on Wireless Communications*, 2000-2001

Editorial Board Member for *Journal of Statistical Theory and Practice*, 2007-2011

Editorial Board Member for *Journal of Advances in Information Fusion*, 2003-2008.

Editorial Board Member for *Communications in Information and Systems (CIS)*, 2001-present

Chair, IEEE Ithaca Section, 1999 – 2000

Coorganizer of *NSF/ONR Workshop on Future Directions in Systems and Control Research in Communication Networks*, Airlie, VA, November 1998

Invited Panelist at the NSF workshop on “Real-time Learning and Decision Making in Dynamical Systems,” Alexandria, VA, Feb 2018.

Invited Speaker at the NSF planning working on “Cognitive Networks,” Los Angeles, CA, Nov 2009.

Invited Speaker at the NSF planning workshop on “Critical Infrastructures,” Arlington, VA, Nov 2006.

Panelist at *DOE/ONR/NSF Workshop on Foundations of Information/Decision Fusion and Applications to Engineering*, Washington D.C., August 1996

Member of NSF review panel to evaluate the CENS STC at UCLA, June 2006

Member of NSF CAREER External Advisory Committee (COV), October 2006.

General Co-Chair for 2003, 2004 *Allerton Conference on Communication, Control, and Computing*

Tutorial Chair for *IEEE ISIT 2004*, Chicago, IL, June-July, 2004

MAJOR CAMPUS SERVICE ACTIVITIES

Member, Illinois Data Science Initiative (iDSI) steering committee

Member, Polsky Center Expansion steering committee

Chair, Distinguished Colloquium Committee, ECE Department, 2016-2017

Chair, Curriculum Committee, ECE Department, 2014-2015

Chair, Faculty Professional Recognition Committee, ECE Department, 2010-2013

Member, Senate and Senate Committee on Information Technology, 2011-2014

Chair, Vodafone Awards Committee, College of Engineering, 2003-2008

RESEARCH ACTIVITIES

Summary: Veeravalli's research interests span the theoretical areas of statistical inference, machine learning, and information theory, with applications to data science, wireless communications, and cyberphysical systems.

Current Research Topics

- Adaptive and active sequential stochastic optimization and learning
 - Anomaly detection and identification in large datasets
 - Rate analysis for detection of sparse mixtures in large datasets
 - Quickest change detection in large sensor networks, including event detection in power systems using PMU measurements
 - Interference management techniques with transmitter/receiver cooperation
 - Uncoordinated dynamic spectrum access
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PUBLICATIONS

Note: Many of these publications are available on <http://vvv.ece.illinois.edu>

Books

[B2] P. Moulin and V.V. Veeravalli. *Statistical Inference for Engineers and Data Scientists*. To be published by Cambridge University Press in Fall 2018.

[B1] V.V. Veeravalli and A. ElGamal. *Interference Management in Wireless Networks: Fundamental Bounds and the Role of Cooperation*. Cambridge University Press, 2018.

Book Chapters

[BC8] V.V. Veeravalli and T. Banerjee. "Quickest Change Detection." In *E-Reference Signal Processing*. Elsevier, 2013. Also available at <http://arxiv.org/pdf/1210.5552v1.pdf>.

[BC7] V.V. Veeravalli. "Fundamentals of Detection Theory." In *Mathematical Foundations for Signal Processing, Communications and Networking*, T. Chen, D. Rajan, and E. Serpedin (Eds.), Cambridge University Press, 2011.

[BC6] S. Sundhar Ram, V. V. Veeravalli and A. Nedic, "Distributed and Recursive Estimation." In *Sensor Networks: When Theory meets Practice*, G. Ferrari, (Ed.), Springer 2010.

[BC5] J. Fuemmeler and V.V. Veeravalli. "Smart Sleeping Policies for Energy-Efficient Tracking in Sensor Networks." In *Networked Sensing Information and Control*, V. Saligrama, (Ed.), Springer 2008.

[BC4] V.V. Veeravalli and J.-F. Chamberland. "Detection in Sensor Networks." In *Wireless Sensor Networks. Signal Processing and Communications Perspectives*, A. Swami et al (Eds.), Wiley, 2007.

[BC3] C. Pandit, J. Huang, S. Meyn, M. Medard, and V.V. Veeravalli, "Entropy, Inference, and Channel Coding." *Wireless Communications, The IMA Volumes in Mathematics and its Applications*, P. Agrawal et al (Eds.), Springer, 2007.

[BC2] A.G. Tartakovsky and V.V. Veeravalli. "Change-Point Detection in Multichannel and Distributed Systems With Applications." In *Applied Sequential Methodologies: An Edited Volume*, N. Mukhopadhyay, S. Datta, and S. Chattopadhyay (Eds.), Marcel-Dekker, 2004.

[BC1] V.V. Veeravalli, T. Başar and H.V. Poor. “Decentralized Sequential Detection with a Fusion Center Performing the Sequential Test.” *IEEE Transactions on Information Theory*, 39(2): 433-442, March 1993. Reprinted as pages 186–195 in “Selected Papers on Sensor and Data Fusion,” F. A. Sadjadi (Edt.), *SPIE Milestone Series, Volume MS 124, SPIE Engineering Press, 1996*.

Journal Papers Under Review

[P3] T.S. Lau, W.P. Tay, and V.V. Veeravalli. “A Semi-Parametric Binning Approach to Quickest Change Detection.” Submitted to *IEEE Transactions on Signal Processing*, Jan 2018.

[P2] S. Zou, G. Fellouris, and V.V. Veeravalli. “Quickest Change Detection under Transient Dynamics: Theory and Asymptotic Analysis.” Submitted to *IEEE Transactions on Information Theory*, Nov 2017.

[P1] M. Bande, A. El Gamal, and V.V. Veeravalli. “Degrees of Freedom in Wireless Interference Networks with Cooperative Transmission and Backhaul Load Constraints.” Submitted to *IEEE Transactions on Information Theory*, Oct 2016, revised May 2017.

Journal Publications

[J91] C. Wilson, V.V. Veeravalli and A. Nedic. “Adaptive Sequential Stochastic Optimization.” To appear in *IEEE Transactions on Automatic Control*, March 2019.

[J90] Y. Bu, S. Zou, Y. Liang and V.V. Veeravalli. “Estimation of KL Divergence: Optimal Minimax Rate.” To appear in *IEEE Transactions on Information Theory*, 2018.

[J89] Y. Li, S. Nitinawarat and V.V. Veeravalli. “Universal Sequential Outlier Hypothesis Testing.” *Sequential Analysis*, 36:3, 309-344, September 2017.

[J88] G. Rovatsos, X. Jiang, A.D. Dominguez-Garcia, and V.V. Veeravalli. “Statistical Power System Line Outage Detection Under Transient Dynamics.” *IEEE Transactions on Signal Processing*, 65(11):2787-2797, June 2017.

[J87] S. Nitinawarat and V.V. Veeravalli. “Universal Scheme for Optimal Search and Stop.” *Bernoulli*, 23(3): 1759-1783, March 2017.

[J86] M. Kim, X. Zhang, J.G. Ligo, F. Farnoud, V.V. Veeravalli, O. Milenkovic. “MetaCRAM: An Integrated Pipeline for Metagenomic Taxonomy Identification and Compression.” *BMC Bioinformatics*, February 2016.

[J85] T. Banerjee and V.V. Veeravalli. “Data-Efficient Minimax Quickest Change Detection with Composite Post-change Hypothesis.” *IEEE Transactions on Information Theory*, 61(9): 5172 - 5184, September, 2015.

[J84] T. Banerjee and V.V. Veeravalli. “Data-Efficient Quickest Change Detection in Sensor Networks.” *IEEE Transactions on Signal Processing*, 63(14): 3727-3735, July 2015.

[J83] T. Banerjee and V.V. Veeravalli. “Data-Efficient Minimax Quickest Change Detection in a Decentralized System.” *Sequential Analysis*, 34(2): 148-170, May 2015.

[J82] Y.C. Chen, T. Banerjee, A.D. Dominguez-Garcia, and V.V. Veeravalli. “Quickest Line Outage Detection and Identification.” *IEEE Transactions on Power Systems*, pp. 1 - 10, February 2015.

[J81] S. Nitinawarat and V.V. Veeravalli. “Controlled Sensing for Sequential Multihypothesis Testing with Controlled Markovian Observations and Non-Uniform Control Cost.” *Sequential Analysis*, 34(1): 1-24, February 2015.

[J80] J. Ligo, G. Atia, and V.V. Veeravalli. “A Controlled Sensing Approach to Graph Classification.” *IEEE Transactions on Signal Processing*, 62(24): 6468-6480, December 2014.

[J79] A. Tajer, V.V. Veeravalli and H.V. Poor. “Outlying Sequence Detection in Large Data Sets: A data-driven approach”. *IEEE Signal Processing Magazine, Special Issue on Signal Processing for Big Data*, 31(5): 44-56, September, 2014.

- [J78] C. Wilson and V.V. Veeravalli. “Degrees of Freedom for the Constant MIMO Interference Channel with CoMP Transmission.” *IEEE Transactions on Communications*, 62(8): 2894 - 2904, August 2014.
- [J77] Y. Li, S. Nitinawarat and V.V. Veeravalli. “Universal Outlier Hypothesis Testing.” *IEEE Transactions on Information Theory*, 60(7): 4066-4082, July 2014.
- [J76] A. ElGamal, V.S. Annapureddy, and V.V. Veeravalli. “Interference Channels with CoMP: Degrees of Freedom, Message Assignment, and Fractional Reuse.” *IEEE Transactions on Information Theory*, 60(6): 3483-3498, June 2014.
- [J75] T. Banerjee and V.V. Veeravalli. “Data-Efficient Quickest Change Detection.” *Sri Lankan Journal of Applied Statistics, Special Issue: Modern Statistical Methodologies in the Cutting Edge of Science*, pp 183-208, Nov 2014. (**Invited.**)
- [J74] V. Raghavan and V.V. Veeravalli. “Ensemble Properties of RVQ-Based Limited-Feedback Beamforming Codebooks.” *IEEE Transactions on Information Theory*, 59(12): 8224-8249, December 2013.
- [J73] T. Banerjee and V.V. Veeravalli. “Data-Efficient Quickest Change Detection in Minimax Settings.” *IEEE Transactions on Information Theory*, 59(10): 6917 - 6931, October 2013.
- [J72] V. Raghavan, S. Hanly and V.V. Veeravalli. “Statistical Beamforming on the Grassmann Manifold for the Two-User Broadcast Channel.” *IEEE Transactions on Information Theory*, 59(10): 6464 - 6489, October 2013.
- [J71] S. Nitinawarat, G. Atia and V.V. Veeravalli. “Controlled Sensing for Multihypothesis Testing.” *IEEE Transactions on Automatic Control*, 58(10): 2451 - 2464, October 2013.
- [J70] A. Nayyar, T. Basar, D. Teneketsis, and V. V. Veeravalli. “Optimal Strategies for Communication and Remote Estimation with an Energy Harvesting Sensor.” *IEEE Transactions on Automatic Control*, 58(9): 2246 - 2260, September 2013.
- [J69] C. Wilson and V.V. Veeravalli. “A Convergent Version of the Max SINR Algorithm for the MIMO Interference Channel.” *IEEE Transactions on Wireless Communication*, 12(6):2952-2961, June 2013.
- [J68] V.S. Annapureddy, A. ElGamal and V.V. Veeravalli. “Degrees of Freedom of Interference Channels with CoMP Transmission and Reception.” *IEEE Transactions on Information Theory*, 58(9): 5740-5760, September 2012.
- [J67] S. Sundhar Ram, A. Nedich, V. V. Veeravalli. “A New Class of Distributed Optimization Algorithms: Application to Regression of Distributed Data.” *Optimization Methods and Software*, 27(1): 71-88, February 2012.
- [J66] T. Banerjee and V.V. Veeravalli. “Data Efficient Quickest Change Detection with On-Off Observation Control.” *Sequential Analysis*, 31: 1-38, January 2012.
- [J65] V.V. Veeravalli and P.K. Varshney, “Distributed Inference in Wireless Sensor Networks.” *Philosophical Transactions of the Royal Society A*, 370: 100-117, January 2012. (**Invited survey paper.**)
- [J64] G.K. Atia, V.V. Veeravalli and J.A. Fuemmeler. “Sensor Scheduling for Energy-Efficient Target Tracking in Sensor Networks .” *IEEE Transactions on Signal Processing*, 59(10): 4923 - 4937 , October 2011.
- [J63] J.A. Fuemmeler, G.K. Atia and V.V. Veeravalli. “Sleep Control for Tracking in Sensor Networks.” *IEEE Transactions on Signal Processing*, 59(9): 4354 - 4366, September 2011.
- [J62] V.S. Annapureddy and V.V. Veeravalli. “Sum Capacity of MIMO Interference Channels in the Low Interference Regime.” *IEEE Transactions on Information Theory*, 57(5): 2565 - 2581, May 2011.
- [J61] R. Tandra, A. Sahai, and V.V. Veeravalli. “Unified Space-Time Metrics to Evaluate Spectrum Sensing.” *IEEE Communications Magazine*, 49(3): 54 - 61, March 2011
- [J60] J. Unnikrishnan, D. Huang, S.P. Meyn, A. Surana and V.V. Veeravalli. “Universal and Composite Hypothesis Testing via Mismatched Divergence.” *IEEE Transactions on Information Theory*, 57(3): . 1587-1603, March 2011.

- [J59] V. Raghavan, A.M. Sayeed, and V.V. Veeravalli. "Semiunitary Precoding for Spatially Correlated MIMO Channels." *IEEE Transactions on Information Theory*, 57(3): 1284-1298, March 2011.
- [J58] J. Unnikrishnan, V.V. Veeravalli and S.P. Meyn. "Minimax Robust Quickest Change Detection." *IEEE Transactions on Information Theory*, 57(3): 1604-1614, March 2011.
- [J57] C. Lin, V.V. Veeravalli and S.P. Meyn. "A Random Search Framework for Convergence Analysis of Distributed Beamforming with Feedback." *IEEE Transactions on Information Theory*, 56(12): 6133-6141, December 2010.
- [J56] S. Sundhar Ram, A Nedic and V. V. Veeravalli. "Distributed Stochastic Subgradient Projection Algorithms for Convex Optimization." *Journal of Optimization Theory and Applications*, 147(3):516-545, July 2010.
- [J55] J. Fuemmeler and V.V. Veeravalli. "Energy Efficient Multi-Object Tracking in Sensor Networks." *IEEE Transactions on Signal Processing*, 58(7): 3742-3750, July 2010.
- [J54] V. Raghavan and V.V. Veeravalli. "Quickest Change Detection of a Markov Process Across a Sensor Array." *IEEE Transactions on Information Theory*, 56(4): 1961-1981, April 2010.
- [J53] S. Sundhar Ram, V. V. Veeravalli and A. Nedic. "Distributed and Recursive Parameter Estimation in Parametrized Linear State-Space Models." *IEEE Transactions on Automatic Control*, 55(2): 488-492, February 2010.
- [J52] J. Unnikrishnan and V.V. Veeravalli. "Algorithms for Dynamic Spectrum Access with Learning for Cognitive Radio." *IEEE Transactions on Signal Processing*, 58 (2):750-760, February 2010.
- [J51] V. S. Annapureddy and V.V. Veeravalli. "Gaussian Interference Networks: Sum Capacity in the Low Interference Regime and New Outer Bounds on the Capacity Region." *IEEE Transactions on Information Theory*, 55(7): 3032-3050, July 2009.
- [J50] S. Sundhar Ram, A. Nedic and V.V. Veeravalli. "Incremental Stochastic Subgradient Algorithms for Convex Optimization." *SIAM Journal on Optimization*, 20 (2): 691-717, February 2009.
- [J49] V. Raghavan, V.V. Veeravalli and A.M. Sayeed. "Quantized Multimode Precoding in Spatially Correlated Multi-Antenna Channels." *IEEE Transactions on Signal Processing*, 56(12): 6017-6030, December 2008.
- [J48] A.G. Tartakovsky and V.V. Veeravalli. "Asymptotically Optimal Quickest Change Detection in Distributed Sensor Systems." *Sequential Analysis*, 27(4): 441-475, October 2008.
- [J47] C. Lin, V. Raghavan and V.V. Veeravalli. "To Code or Not To Code Across Time: Space-Time Coding with Feedback." *IEEE JSAC Special Issue on Limited Feedback*, 26(8):1558-1598, October 2008.
- [J46] J. Fuemmeler and V.V. Veeravalli. "Smart Sleeping Policies for Energy Efficient Tracking in Sensor Networks." *IEEE Transactions on Signal Processing*, 56(5): 2091-2102, May 2008.
- [J45] S. Appadwedula, V.V. Veeravalli and D.L. Jones. "Decentralized Detection With Censoring Sensors." *IEEE Transactions on Signal Processing*, 56(4): 1362-1373, April 2008.
- [J44] J. Unnikrishnan and V.V. Veeravalli. "Cooperative Sensing for Primary Detection in Cognitive Radio." *IEEE Journal on Selected Topics in Signal Processing, Special Issue on Dynamic Spectrum Access*, 2(1): 18-27, February 2008.
- [J43] C. Lin and V.V. Veeravalli. "Optimal Linear Dispersion Codes for Correlated MIMO Channels." *IEEE Transactions on Wireless Communications*, 7(2): 657-666, February 2008.
- [J42] J. Chen and V.V. Veeravalli. "Capacity Results for Block-Stationary Gaussian Fading Channels with a Peak Power Constraint." *IEEE Transactions on Information Theory*, 53 (12): 4498-4520, December 2007.
- [J41] Y. Liang, V.V. Veeravalli and H.V. Poor "Resource Allocation for Wireless Fading Relay Channels: Max-Min Solution." *IEEE Transactions on Information Theory, Special Issue on Models, Theory and Codes for Relaying and Cooperation in Communication Networks*, 53(10): 3432-3453, October 2007 .

- [J40] J.-F. Chamberland and V.V. Veeravalli. "Wireless Sensors in Distributed Detection Applications." *IEEE Signal Processing Magazine Special Issue on Resource-Constrained Signal Processing, Communications, and Networking*, 24(3): 16-25, May 2007.
- [J39] Y. Liang and V.V. Veeravalli. "Cooperative Relay Broadcast Channels." *IEEE Transactions on Information Theory*, 53(3): 900-928, March 2007.
- [J38] R. Prakash and V.V. Veeravalli. "Centralized Wireless Data Systems with User Arrivals and Departures." *IEEE Transactions on Information Theory*, 53(2): 695-713, February 2007.
- [J37] J.-F. Chamberland and V.V. Veeravalli. "How Dense Should a Sensor Network be for Decentralized Detection with Correlated Observations?." *IEEE Transactions on Information Theory*, 52(11):5099-5106, November 2006.
- [J36] Y. Liang and V.V. Veeravalli. "Gaussian Orthogonal Relay Channels: Optimal Resource Allocation." *IEEE Transactions on Information Theory*, 51(9):3284 - 3289, Sept 2005.
- [J35] V.V. Veeravalli, Y. Liang and A.M. Sayeed. "Correlated MIMO wireless channels: capacity, optimal signaling, and asymptotics." *IEEE Transactions on Information Theory*, 51(6):2058-2072, June 2005.
- [J34] S. Appadwedula, V.V. Veeravalli, and D.L. Jones. "Energy Efficient Detection in Sensor Networks." *IEEE JSAC Special Issue on Sensor Networks*, 23(4): 693-702, April 2005.
- [J33] Y. Liang and V.V. Veeravalli. "Capacity of Noncoherent Time-Selective Block Fading Channels." *IEEE Transactions on Information Theory*, 50(12):3095-3110, December 2004.
- [J32] A.G. Tartakovsky and V.V. Veeravalli. "General Asymptotic Bayesian Theory of Quickest Change Detection." *SIAM: Theory of Probability and its Applications*, 49(3):458-497, 2004.
- [J31] J.-F. Chamberland and V.V. Veeravalli. "Asymptotic Results for Decentralized Detection in Power Constrained Wireless Sensor Networks." *IEEE JSAC Special Issue on Fundamental Performance Limits of Wireless Sensor Networks*. 22(6):1007-1015, August 2004.
- [J30] J.-F. Chamberland and V.V. Veeravalli. "Decentralized Dynamic Power Control for Cellular CDMA Systems." *IEEE Transactions on Wireless Communications*, 2(3): 549-559, May 2003.
- [J29] A. Mantravadi, V.V. Veeravalli and H. Viswanathan. "Spectral Efficiency of MIMO Multiaccess Systems with Single-user decoding." *IEEE Journal on Selected areas in Communications: Special Issue on MIMO Systems and Applications*, 21(3): 382-394, April 2003.
- [J28] R. Prakash and V.V. Veeravalli. "Locally Optimal Soft Handoff Algorithms." *IEEE Transactions on Vehicular Technology*, 52(2): 347-356, March 2003.
- [J27] J.-F. Chamberland and V.V. Veeravalli. "Decentralized Detection in Sensor Networks." *IEEE Transactions on Signal Processing*, 51(2): 407-416, February 2003. (**IEEE Signal Processing Society 2006 Young Author Best Paper Award.**)
- [J26] A. Mantravadi and V.V. Veeravalli. "MMSE detection in asynchronous CDMA systems: An equivalence result." *IEEE Transactions on Information theory*, 48(12): 3128-38, December 2002.
- [J25] V.V. Veeravalli and A. Mantravadi. "The Coding-Spreading Tradeoff in CDMA Systems." *IEEE JSAC Special Issue on Multiuser Detection Techniques*, 20(2): 396-408, February 2002.
- [J24] V.V. Veeravalli. "On Performance Analysis for Signaling on Correlated Fading Channels." *IEEE Transactions on Communications*. 49(11): 1879-85, November 2001.
- [J23] A. Mantravadi and V.V. Veeravalli. "Chip-Matched Filtering and Discrete Sufficient Statistics for Asynchronous Band-limited CDMA Systems." *IEEE Transactions on Communications*. 49(8): 1457-67, August 2001.
- [J22] D.R. Brown, M. Motani, V.V. Veeravalli, H.V. Poor and C.R. Johnson. "On the Performance of Linear Parallel Interference Cancellation." *IEEE Transactions on Information Theory*. 47(5): 1957-70, July 2001.
- [J21] V.V. Veeravalli. "Decentralized Quickest Change Detection." *IEEE Transactions on Information*

Theory. 47(4): 1657-65, May 2001.

[J20] R. Prakash and V.V. Veeravalli. "Adaptive Hard Handoff Algorithms." *IEEE Journal on Selected Areas in Communications - Wireless Communication Series*. 18(11): 2456 -2464, November 2000.

[J19] V. Dragalin, A.G. Tartakovsky and V.V. Veeravalli. "Multihypothesis Sequential Probability Ratio Tests, Part II: Accurate Expansions for the Expected Sample Size." *IEEE Transactions on Information Theory*. 46(4): 1366-1383, July 2000.

[J18] V. Tripathi, A. Mantravadi and V.V. Veeravalli. "Channel Acquisition for Wideband CDMA Signals." *IEEE JSAC special issue on Wideband CDMA*. 18(8): 1483-1494, August 2000.

[J17] A. Mantravadi and V.V. Veeravalli. "Multiple-Access Interference Resistant Acquisition for Band-limited CDMA Systems with Random Sequences." *IEEE Journal on Selected Areas in Communications - Wireless Communication Series*. 18(7): 1203-1213, July 2000.

[J16] V. Dragalin, A.G. Tartakovsky and V.V. Veeravalli. "Multihypothesis Sequential Probability Ratio Tests, Part I: Asymptotic Optimality." *IEEE Transactions on Information Theory*. 45(7): 2448-2462, November 1999.

[J15] V.V. Veeravalli and A. Sendonaris. "The Coverage-Capacity Tradeoff in Cellular CDMA Systems." *IEEE Transactions on Vehicular Technology*. 48(5):1443-1451, September 1999.

[J14] A. Sendonaris, V.V. Veeravalli and B. Aazhang. "Joint Signaling Strategies for Approaching the Capacity of Twisted Pair Channels." *IEEE Transactions on Communications*. 46(5): 673-685, May 1998.(This work was used in the standardization of HDSL2 second-generation high-bit-rate digital subscriber lines.)

[J13] V.V. Veeravalli. "Sequential Decision Fusion: Theory and Applications." *Journal of the Franklin Institute*. 336(2): 301-322, February 1999. (**Invited.**)

[J12] V.V. Veeravalli and O.E. Kelly. "A Locally Optimal Handoff Algorithm for Cellular Communications." *IEEE Transactions on Vehicular Technology*. 46(3): 603-610, August 1997.

[J11] V.V. Veeravalli and C.W. Baum. "Hybrid Acquisition of Direct Sequence CDMA Signals." *International Journal of Wireless Information Networks*, 3(1): 55-65, January, 1996.

[J10] V.V. Veeravalli and C.W. Baum. "Asymptotic Efficiency of a Sequential Multihypothesis Test." *IEEE Transactions on Information Theory*, 41(6): 1994-1997, November 1995.

[J9] C.W. Baum and V.V. Veeravalli. "A Sequential Procedure for Multihypothesis Testing." *IEEE Transactions on Information Theory*, 40(6): 1994-2007, November 1994. (**1996 IEEE Browder J. Thompson Award.**)

[J8] V.V. Veeravalli, T. Başar and H.V. Poor. "Decentralized Sequential Detection with Sensors Performing Sequential Tests." *Journal on Mathematics of Control Signals and Systems*, 7(4): 292-305, December 1994.

[J7] V.V. Veeravalli, T. Başar and H.V. Poor. "Minimax Robust Decentralized Detection." *IEEE Transactions on Information Theory*, 40(1): 35-40, January 1994.

[J6] V.V. Veeravalli, T. Başar and H.V. Poor. "Decentralized Sequential Detection with a Fusion Center Performing the Sequential Test." *IEEE Transactions on Information Theory*, 39(2): 433-442, March 1993.

[J5] V.V. Veeravalli. "Comments on Decentralized Sequential Detection." *IEEE Transactions on Information Theory*, 38(4):1428-1429, July 1992.

[J4] V.V. Veeravalli and H.V. Poor. "Quadratic Detection of Signals with Drifting Phase." *Journal of the Acoustical Society of America*, 89(2): 811-819, February 1991.

[J3] R.R. Katti, V.V. Veeravalli, B.V.K. Vijaya Kumar and M.H. Kryder. "Model for Demagnetization-Induced Noise in Thin-Film Magnetic Recording Media." *IEEE Transactions on Magnetics*, 24(4): 2150-2158, July 1988.

[J2] V.V. Veeravalli, R.R. Katti, B.V.K. Vijaya Kumar and M.H. Kryder. "Time-domain Model for Noise from Particulate Recording Media." *Journal of Applied Physics*, 61(8-IIB): 4034-4036, April 1987.

[J1] B.V.K. Vijaya Kumar and V.V. Veeravalli. "Approximate Lower Bound for the SNR of Matched Filters." *Journal of the Franklin Institute*, 324(1): 139-147, January 1987.

Conference Publications and Presentations

[C225] V.V. Veeravalli. "Quickest Detection of Dynamically Evolving Events in Networks." *ITA workshop*, San Diego, CA, February 2018. **(Invited.)**

[C224] M. Bande and V.V. Veeravalli. "Design of a Heterogeneous Cellular Network with a Wireless Backhaul." In *Proc. IEEE International Conference on Computer Communications and Networks (ICCCN)*, Vancouver, Canada, July-August 2017. **(Invited.)**

[C223] Y. Bu, S. Zou, and V.V. Veeravalli. "Linear-Complexity Exponentially-Consistent Tests for Universal Outlying Sequence Detection." In *Proc. IEEE ISIT*, Aachen, Germany, June 2017.

[C222] S. Zou, G. Fellouris, and V.V. Veeravalli. "Asymptotic Optimality of D-CuSum for Quickest Change Detection under Transient Dynamics." In *Proc. IEEE ISIT*, Aachen, Germany, June 2017.

[C221] J.G. Ligo, G.V. Moustakides and V.V. Veeravalli. "Sparse Gaussian Mixture Detection: Low Complexity, High Performance Tests via Quantization." In *Proc. IEEE ISIT*, Aachen, Germany, June 2017.

[C220] V. V. Veeravalli. "Quickest Change Detection under Transient Dynamics." *International Workshop on Sequential Methodologies (IWSM)*, Rouen, France, June 2017. **(Invited.)**

[C219] G. Fellouris, G.V. Moustakides, and V.V. Veeravalli. "Multistream Quickest Change Detection: Asymptotic Optimality Under a Sparse Signal." In *Proc. IEEE ICASSP*, New Orleans, LA, March 2017. **(Invited.)**

[C218] G. Rovatsos, S. Zou, and V.V. Veeravalli. "Quickest Change Detection Under Transient Dynamics." In *Proc. IEEE ICASSP*, New Orleans, LA, March 2017.

[C217] T.S. Lau, W.P. Tay, and V.V. Veeravalli. "Quickest Change Detection with Unknown Post-Change Distribution." In *Proc. IEEE ICASSP*, New Orleans, LA, March 2017.

[C216] M. Bande, V. V. Veeravalli, A. Tolli, and M. Juntti. "DoF analysis in a Two-Layered Heterogeneous Wireless Interference Network." In *Proc. IEEE ICASSP*, New Orleans, LA, March 2017.

[C215] J.G. Ligo, G.V. Moustakides and V.V. Veeravalli. "Detection of Sparse Mixtures: The Finite Alphabet Case." In *Proc. IEEE Asilomar Conference on Signals, Systems and Computers*, Pacific Grove, CA, November 2016. **(Invited.)**

[C214] C. Wilson and V.V. Veeravalli. "Adaptive Sequential Learning." In *Proc. IEEE Asilomar Conference on Signals, Systems and Computers*, Pacific Grove, CA, November 2016. **(Invited.)**

[C213] J. Kaleva, M. Bande, A. Tolli, M. Juntti, and V.V. Veeravalli. "Sum rate maximizing joint processing with limited backhaul and tree topology constraints." in *Proc. IEEE International Workshop on Signal Processing Advances in Wireless Communications (SPAWC)*, Edinburgh, UK, July 2016. **(Invited.)**

[C212] G.V. Moustakides and V.V. Veeravalli. "Sequentially Detecting Transitory Changes." In *Proc. IEEE ISIT*, Barcelona, Spain, July 2016.

[C211] C. Wilson and V.V. Veeravalli. "MMSE Estimation in a Sensor Network in the Presence of an Adversary." In *Proc. IEEE ISIT*, Barcelona, Spain, July 2016.

[C210] Y. Bu, S. Zou, Y. Liang, and V.V. Veeravalli. "Estimation of KL Divergence Between Large-Alphabet Distributions." In *Proc. IEEE ISIT*, Barcelona, Spain, July 2016.

[C209] V.V. Veeravalli. "Quickest Detection and Isolation of Line Outages in Power Systems Under Transient Dynamics." *International Workshop on Applied Probability (IWAP)*, Toronto, Canada, June 2016. **(Invited.)**

[C208] J. Ligo, G. Moustakides, and V.V. Veeravalli. "Rate Analysis for Detection of Sparse Mixtures." In *Proc. IEEE ICASSP*, Shanghai, China, March 2016.

[C207] Y. Bu, S. Zou, Y. Liang, and V.V. Veeravalli. "Universal Outlying Sequence Detection for Continu-

- ous Observations.” In *Proc. IEEE ICASSP*, Shanghai, China, March 2016.
- [C206] G. Rovatsos, X. Jiang, A. Dominguez-Garcia and V.V. Veeravalli. “Comparison of Statistical Algorithms for Power System Line Outage Detection.” In *Proc. IEEE ICASSP*, Shanghai, China, March 2016.
- [C205] Y. Li and V.V. Veeravalli “Outlying Sequence Detection in Large Datasets: Comparison of Universal Hypothesis Testing and Clustering.” In *Proc. IEEE ICASSP*, Shanghai, China, March 2016.
- [C204] C. Wilson and V.V. Veeravalli. “Adaptive Sequential Optimization with Applications to Machine Learning.” In *Proc. IEEE ICASSP*, Shanghai, China, March 2016.
- [C203] J. Ligo, G. Moustakides, and V.V. Veeravalli. “Rate Analysis for Detection of Sparse Mixtures.” *ITA workshop*, San Diego, CA, February 2016. **(Invited.)**
- [C202] S. Nitinawarat and V.V. Veeravalli. “Universal Quickest Outlier Detection and Isolation.” *Conference on Applied Stochastic Models and Data Analysis (ASMDA)*, Athens, Greece, July 2015. **(Invited.)**
- [C201] V.V. Veeravalli. “Quickest Detection and Isolation of Line Outages in Power Systems.” Invited presentation at *International Workshop on Sequential Methodologies (IWSM)*, New York, June 2015. **(Invited.)**
- [C200] M. Bande, A. El Gamal, and V.V. Veeravalli. “Flexible Backhaul Design with Cooperative Transmission in Cellular Interference Networks.” In *Proc. IEEE ISIT*, Hong Kong, June 2015.
- [C199] S. Nitinawarat and V.V. Veeravalli. “Universal Quickest Outlier Detection and Isolation.” In *Proc. IEEE ISIT*, Hong Kong, June 2015.
- [C198] Y. Li, S. Nitinawarat, Y. Su and V.V. Veeravalli. “Universal Outlier Hypothesis Testing: Application to Anomaly Detection.” In *Proc. IEEE ICASSP*, Brisbane, Australia, April 2015.
- [C197] V.V. Veeravalli. “Flexible Backhaul Design for Cellular Interference Management.” *International Conference on Computing, Networking, and Communications (ICNC)*, Anaheim, CA. February 2015. **(Plenary.)**
- [C196] Y. Li, S. Nitinawarat and V.V. Veeravalli. “Universal Outlier Hypothesis Testing.” *ITA workshop*, San Diego, CA, February 2015. **(Invited.)**
- [C195] S. Nitinawarat and V.V. Veeravalli. “Universal Scheme for Optimal Search and Stop.” *ITA workshop*, San Diego, CA, February 2015. **(Invited.)**
- [C194] C. Wilson and V.V. Veeravalli. “Learning a Sequence of Slowly Varying Tasks.” *ITA workshop*, San Diego, CA, February 2015. **(Invited.)**
- [C193] C. Wilson, V.V. Veeravalli and A. Nedic. “Dynamic Stochastic Optimization.” In *Proc. IEEE CDC*, Los Angeles, CA, Dec 2014. **(Invited.)**
- [C192] V.V. Veeravalli. “Flexible Backhaul Design for 5G Cellular Interference Management.” In panel on “Advances in Radio Access for 5G”, at the first *5G North America (5GNA) Workshop*, Asilomar, Pacific Grove, CA, November 2014. **(Invited.)**
- [C191] Y. Li, S. Nitinawarat and V.V. Veeravalli. “Universal Sequential Outlier Hypothesis Testing.” In *Proc. IEEE Asilomar Conference on Signals, Systems and Computers*, Pacific Grove, CA, November 2014. **(Invited.)**
- [C190] V.V. Veeravalli, A. El Gamal and V.S. Annapureddy. “Flexible Backhaul Design for Cellular Interference Management.” *ACM MobiHoc*, Philadelphia, PA, 2014. **(Invited.)**
- [C189] Y. Li, S. Nitinawarat and V.V. Veeravalli. “Universal Sequential Outlier Hypothesis Testing.” In *Proc. IEEE ISIT*, pp. 3205-09, Honolulu, HI, July 2014.
- [C188] A. El Gamal and V.V. Veeravalli. “Flexible Backhaul Design and Degrees of Freedom for Linear Interference Networks.” In *Proc. IEEE ISIT*, pp. 2694-98, Honolulu, HI, July 2014.
- [C187] T. Banerjee and V.V. Veeravalli. “Data-efficient Quickest Change Detection with Unknown Post-change Distribution.” In *Proc. IEEE ISIT*, pp. 741-745, Honolulu, HI, July 2014.
- [C186] T. Banerjee, Y.C. Chen, A.D. Dominguez-Garcia and V.V. Veeravalli. “Power System Line Outage

Detection and Identification – A Quickest Change Detection Approach.” In *Proc. IEEE ICASSP*, pp. 3774-78, Florence, Italy, May 2014.

[C185] V.V. Veeravalli. “Universal Outlying Sequence Detection.” *IMSE Symposium*, University of Illinois, February 2014. **(Invited.)**

[C184] A. El Gamal and V.V. Veeravalli. “Flexible Backhaul Design and Degrees of Freedom of Linear Interference Networks.” *ITA workshop*, San Diego, CA, February 2014. **(Invited.)**

[C183] T. Banerjee and V.V. Veeravalli. “Data-Efficient Quickest Change Detection with Unknown Post Change Distribution.” *ITA workshop*, San Diego, CA, February 2014. **(Invited Poster Presentation.)**

[C182] V.V. Veeravalli. “Universal Outlying Sequence Detection.” *ITA workshop*, San Diego, CA, February 2014. **(Invited.)**

[C181] V.V. Veeravalli. “Universal Outlier Hypothesis Testing.” *Cognition and Control Workshop*, University of Florida, Gainesville, February 2014. **(Invited.)**

[C180] Y. Li, S. Nitinawarat and V.V. Veeravalli. “Universal Multiple Outlier Hypothesis Testing.” In *Proc. IEEE CAMSAP Workshop*, St. Martin, December 2013. **(Invited.)**

[C179] M.Kim, J. Ligo, A. Emad, O. Milenkovic and V.V. Veeravalli. “MetaPar: Metagenomic Sequence Assembly via Iterative Reclassification.” In *Proc. IEEE GlobalSIP Conference*, Austin, TX, December 2013. **(Invited.)**

[C178] A. ElGamal and V.V. Veeravalli. “Dynamic Interference Management.” In *Proc. IEEE Asilomar Conference on Signals, Systems and Computers*, Pacific Grove, CA, November 2013.

[C177] C. Wilson and V.V. Veeravalli. “Degrees of Freedom for the Constant MIMO Interference Channel with CoMP Transmission.” In *Proc. IEEE Asilomar Conference on Signals, Systems and Computers*, Pacific Grove, CA, November 2013.

[C176] S. Nitinawarat and V.V. Veeravalli. “Controlled Sensing for Sequential Multihypothesis Testing with Non-Uniform Sensing Cost.” In *Proc. IEEE Asilomar Conference on Signals, Systems and Computers*, Pacific Grove, CA, November 2013. **(Invited.)**

[C175] J. Ligo, M.Kim, A. Emad, O. Milenkovic and V.V. Veeravalli. “MCUIUC - A New Framework for Metagenomic Read Compression.” In *Proc. IEEE Information Theory Workshop*, Sevilla, Spain, September 2013.

[C174] V.V. Veeravalli. “Controlled Sensing for Multihypothesis Testing.” *International Workshop on Sequential Methodologies (IWSM)*, Athens, GA, July 2013. **(Invited.)**

[C173] T. Banerjee and V.V. Veeravalli. “Data-Efficient Quickest Change Detection.” *International Workshop on Sequential Methodologies (IWSM)*, Athens, GA, July 2013. **(Invited.)**

[C172] A. Elgamal and V.V. Veeravalli. “Dynamic Interference Management.” Poster Presentation at *IEEE ISIT*, Istanbul, Turkey, July 2013

[C171] S. Nitinawarat and V.V. Veeravalli. “Controlled Sensing for Multihypothesis Testing Based on Markovian Observations.” In *Proc. IEEE ISIT*, Istanbul, Turkey, July 2013.

[C170] T. Banerjee, V.V. Veeravalli, and A. Tartakovsky. “Decentralized Data-Efficient Quickest Change Detection.” In *Proc. IEEE ISIT*, Istanbul, Turkey, July 2013.

[C169] Y. Li, S. Nitinawarat, and V.V. Veeravalli. “Universal Outlier Hypothesis Testing.” In *Proc. IEEE ISIT*, Istanbul, Turkey, July 2013.

[C168] T. Banerjee and V.V. Veeravalli. “Data-Efficient Quickest Change Detection in Distributed and Multi-Channel Systems.” In *Proc. IEEE ICASSP*, Vancouver, Canada, May 2013.

[C167] K. Harris and V.V. Veeravalli. “Implementing Energy-Efficient Tracking in a Sensor Network.” In *Proc. IEEE ICASSP*, Vancouver, Canada, May 2013.

[C166] J. Ligo, G. Atia and V.V. Veeravalli. “A Controlled Sensing Approach to Graph Classification.” In

Proc. IEEE ICASSP, Vancouver, Canada, May 2013.

[C165] V.V. Veeravalli. “Universal Outlier Hypothesis Testing.” In *NSF Workshop on Signal Processing for Big Data*, Arlington, VA, March 2013. **(Invited.)**

[C164] S. Nitinawarat, Y. Li, and V.V. Veeravalli. “Universal Outlier Detection.” In *ITA workshop*, San Diego, CA, February 2013. **(Invited.)**

[C163] T. Banerjee and V.V. Veeravalli. “Data-Efficient Quickest Change Detection.” In *ITA workshop*, San Diego, CA, February 2013. **(Invited.)**

[C162] A. ElGamal V. S. Annapureddy and V.V. Veeravalli. “Interference Channels with Coordinated Multi-Point (CoMP) transmission.” In *ITA workshop*, San Diego, CA, February 2013. **(Invited.)**

[C161] A. Nayyar, T. Basar, D. Teneketsis, and V. V. Veeravalli. “Communication Scheduling and Remote Estimation with Energy Harvesting Sensor.” In *Proc. IEEE CDC*, Maui, Hawaii, December 2012.

[C160] T. Banerjee and V.V. Veeravalli, “Energy-Efficient Quickest Change Detection in Sensor Networks.” In *Proc. IEEE Statistical Signal Processing (SSP) Workshop*, Michigan, Ann Arbor, August 2012.

[C159] A. El Gamal, V.S. Annapureddy, and V. V. Veeravalli, “Degrees of Freedom (DoF) of Locally Connected Interference Channels with Cooperating Multiple-Antenna Transmitters.” In *Proc. IEEE ISIT 2012*, Boston, MA, July 2012.

[C158] G. Atia and V.V. Veeravalli. “Controlled Sensing for Sequential Multihypothesis Testing.” In *Proc. IEEE ISIT 2012*, Boston, MA, July 2012.

[C157] V.V. Veeravalli. “Degrees of Freedom of Interference Channels with CoMP Transmission and Reception.” *Workshop on Interference in Networks*, Boston, MA, June 2012. **(Invited.)**

[C156] V.V. Veeravalli. “Quickest Change Detection in Sensor Networks.” *IEEE Sensor Array and Multi-channel (SAM) Signal Processing Workshop*, Hoboken, NJ, June, 2012. **(Plenary Lecture.)**

[C155] T. Banerjee and V.V. Veeravalli. “Data-Efficient Quickest Change Detection.” *International Workshop on Sequential Methodologies and Applications (IWSM&A)*, Rouen, France, June 2012. **(Invited.)**

[C154] A. El Gamal, V. S. Annapureddy, and V. V. Veervalli, “Degrees of freedom (DoF) of locally connected interference channels with Coordinated Multi-Point (CoMP) transmission,” in *Proc. IEEE International Conference on Communications (ICC)*, Ottawa, June 2012.

[C153] A. El Gamal, V.S. Annapureddy, and V. V. Veeravalli, “DoF of interference channels with CoMP transmission and reception.” In *IEEE Communication Theory Workshop*, Maui, Hawaii, May 2012.

[C152] S. Nitinawarat, G. Atia, and V.V. Veeravalli. “Controlled sensing for hypothesis testing.” In *Proc. IEEE ICASSP*, Kyoto, Japan, March 2012. **(Invited.)**

[C151] T. Banerjee and V.V. Veeravalli, “Data-efficient minimax quickest change detection. In *Proc. IEEE ICASSP*, Kyoto, Japan, March 2012.

[C150] A. El Gamal, V.S. Annapureddy, and V. V. Veeravalli, “Optimal Message Assignments for the K-User Gaussian Interference Channel with Coordinated Multi-Point (CoMP) Transmission.” In *Proc. Conference of Information Sciences and Systems (CISS)*, Princeton, NJ, March 2012.

[C149] S. Nitinawarat, G. Atia, and V.V. Veeravalli. “Controlled sensing for hypothesis testing.” In *Proc. ITA workshop*, San Diego, CA, February 2012. **(Invited.)**

[C148] A. Nayyar, T. Başar, D. Teneketzis, and V.V. Veeravalli. “Communication scheduling and remote estimation with energy harvesting sensor.” In *Proc. ITA workshop*, San Diego, CA, February 2012. **(Invited.)**

[C147] V. V. Veeravalli, V.S. Annapureddy, and A. El Gamal “DoF of interference channels with CoMP transmission and reception.” In *ITA workshop*, San Diego, CA, February 2012. **(Invited.)**

[C146] S. Nitinawarat, G. Atia, and V.V. Veeravalli. “Efficient Target Tracking using Mobile Sensors.” In *Proc. IEEE CAMSAP 2011*, San Juan, Puerto-Rico, December 2011.

[C145] V.V. Veeravalli. “Sensor Control for Information Collection and Fusion.” *International Workshop on*

Information Fusion, Xi'an, China, August 2011. **(Plenary Lecture.)**

[C144] C. Wilson and V.V. Veeravalli. "A Convergent Version of Max SINR for the MIMO Interference Channel." In *Proc. IEEE ISIT 2011*, St. Petersburg, Russia, August 2011.

[C143] V.S. Annapureddy, A. El Gamal and V. V. Veeravalli. "Degrees of Freedom of Cooperative Interference Networks." In *Proc. IEEE ISIT 2011*, St. Petersburg, Russia, August 2011.

[C142] V.V. Veeravalli and T. Banerjee. "Quickest Change Detection with On-Off Observation Control." *International Workshop in Sequential Methodologies*, Palo Alto, CA, June 2011. **(Invited.)**

[C141] G. Atia and V.V. Veeravalli. "Sensor management for energy-efficient tracking in cluttered environments." In *Proc. ITA workshop, UCSD*, San Diego, CA, February 2011. **(Invited.)**

[C140] T. Banerjee and V.V. Veeravalli. "Bayesian Quickest Change Detection Under Energy Constraints." In *Proc. ITA workshop, UCSD*, San Diego, CA, February 2011. **(Invited.)**

[C139] G.K. Atia, V.V. Veeravalli and J.A. Fuemmeler. "Sensor scheduling for energy-efficient target tracking in sensor networks." In *Proc. IEEE Asilomar Conference on Signals, Systems and Computers*, Pacific Grove, CA, November 2010.

[C138] K. Premkumar, A. Kumar and V.V. Veeravalli. "Bayesian Quickest Transient Change Detection." In *Proc. International Workshop on Applied Probability*, Madrid, Spain, July 2010. **(Invited.)**

[C137] J. Unnikrishnan, S. Meyn and V.V. Veeravalli. "On Thresholds for Robust Goodness-of-Fit Tests. In *Proc. Information Theory Workshop*, Dublin, Ireland, August 2010.

[C136] V.S. Annapureddy, A. El Gamal and V. V. Veeravalli. "Degrees of freedom of the K-user interference channel with transmitter cooperation." In *Proc. IEEE ISIT*, Austin, Texas, June 2010.

[C135] V. Raghavan, V.V. Veeravalli and S. Hanly. "Linear Beamforming for the Spatially Correlated MISO broadcast channel." In *Proc. IEEE ISIT*, Austin, Texas, June 2010.

[C134] R. Tandra, A. Sahai and V.V. Veeravalli. "Space-Time Metrics for Spectrum Sensing." In *Proc. IEEE DYSpan*, Singapore, April 2010.

[C133] S.S. Ram, V.V. Veeravalli and A. Nedic. "Distributed stochastic optimization and its application to estimation in sensor networks." In *Proc. ITA workshop, UCSD*, San Diego, CA, February 2010. **(Invited.)**

[C132] J. Unnikrishnan, V.V. Veeravalli and S.P. Meyn. "Minimax robust quickest change detection." In *Proc. ITA workshop, UCSD*, San Diego, CA, February 2010. **(Invited.)**

[C131] V.S. Annapureddy and V. V. Veeravalli. "Sum Capacity of MISO and SIMO Interference Channels." In *Proc. IEEE ITW*, Cairo, Egypt, January 2010. **(Invited.)**

[C130] S. S. Ram, A Nedic and V. V. Veeravalli, "Asynchronous Gossip Algorithms for Stochastic Optimization." In *Proc. IEEE Conference on Decision and Control (CDC)*, Shanghai, China, December 2009. **(Invited.)**

[C129] V. Raghavan, M.L. Honig and V.V. Veeravalli. "Performance analysis of RVQ-based limited feedback beamforming codebooks." In *Proc. IEEE ISIT*, Seoul, South Korea, August 2009.

[C128] V. Raghavan and V.V. Veeravalli. "Bayesian quickest change process detection." In *Proc. IEEE ISIT*, Seoul, South Korea, August 2009.

[C127] J. Unnikrishnan, V.V. Veeravalli and S.P. Meyn. "Least favorable distributions for robust quickest change detection." In *Proc. IEEE ISIT*, Seoul, South Korea, August 2009.

[C126] D. Huang, J. Unnikrishnan, S.P. Meyn and V.V. Veeravalli and A. Surana. "Statistical SVMs for robust detection, supervised learning, and universal classification." In *Proc. IEEE ITW*, Volos, Greece, June 2009. **(Invited.)**

[C125] V.S. Annapureddy, V. V. Veeravalli and S. Vishwanath. "Sum Capacity of Gaussian MIMO Interference Channels in the Low Interference Regime." *IEEE Communication Theory Workshop*, Napa, CA, May 2009. **(Invited.)**

- [C124] S. S. Ram, A Nedic and V. V. Veeravalli, "Asynchronous Gossip Algorithms for Stochastic Optimization." In *Proc. IEEE GamesNets*, Istanbul, Turkey, May 2009
- [C123] S. S. Ram, A Nedic and V. V. Veeravalli, "Distributed subgradient projection algorithm for convex optimization." In *Proc. IEEE ICASSP*, Taipei, Taiwan, April 2009.
- [C122] S. S. Ram, V. V. Veeravalli and A. Nedic, "Distributed Non-Autonomous Power Control through Distributed Convex Optimization," In *Proc. IEEE INFOCOM*, Rio de Janeiro, April 2009
- [C121] V.S. Annapureddy, V. V. Veeravalli and S. Vishwanath. "Sum capacity of MIMO interference channels in the low interference regime." In *Proc. ITA workshop, UCSD*, San Diego, CA, February 2009. (**Invited.**)
- [C120] D. Huang, J. Unnikrishnan, S.P. Meyn and V.V. Veeravalli and A. Surana. "Statistical SVMs for robust detection and universal classification." In *Proc. ITA workshop, UCSD*, San Diego, CA, February 2009. (**Invited.**)
- [C119] V. Raghavan and V.V. Veeravalli. "Limited feedback for spatially correlated MISO broadcast channels." In *Proc. ITA workshop, UCSD*, San Diego, CA, February 2009. (**Invited.**)
- [C118] V.S. Annapureddy and V. V. Veeravalli. "Capacity of Gaussian Interference Networks in the Noisy Interference Regime." In *Proc. WISARD*, Bangalore, India, January 2009. (**Invited.**)
- [C117] J. Unnikrishnan and V.V. Veeravalli. "Dynamic Spectrum Access Policies for Cognitive Radio." In *Proc. IEEE CDC*, Cancun, Mexico, December 2008. (**Invited.**)
- [C116] V.S. Annapureddy, V. V. Veeravalli and S. Vishwanath. "On the Sum Capacity of MIMO Interference Channel in the Low Interference Regime." In *Proc. IEEE Asilomar Conference on Signals, Systems and Computers*, Pacific Grove, CA, November 2008. (**Invited.**)
- [C115] D. Huang, V. Raghavan, A. Poon, V.V. Veeravalli. "Angular Domain Processing for MIMO Wireless Systems with Non-uniform Antenna Arrays." In *Proc. IEEE Asilomar Conference on Signals, Systems and Computers*, Pacific Grove, CA, November 2008. (**Invited.**)
- [C114] V. Raghavan and V.V. Veeravalli. "Codebook Design for the Spatially Correlated MISO Broadcast Channel." In *Proc. IEEE Asilomar Conference on Signals, Systems and Computers*, Pacific Grove, CA, November 2008. (**Invited.**)
- [C113] J. Unnikrishnan and V.V. Veeravalli. "Dynamic Spectrum Access with Learning for Cognitive Radio." In *Proc. IEEE Asilomar Conference on Signals, Systems and Computers*, Pacific Grove, CA, November 2008. (**Invited.**)
- [C112] V.V. Veeravalli and J. Fuemmeler. "Energy-Efficient Multi-Target Tracking Using Sensor Networks." Army Conference on Applied Statistics (ACAS), Lexington, VA, October 2008. (**Invited.**)
- [C111] S.S. Ram, V.V. Veeravalli and A. Nedic. "Incremental Recursive Prediction Error Algorithm for Parameter Estimation in Sensor Networks." In *Proc. IEEE Fusion*, Cologne, Germany, July 2008. (**Invited.**)
- [C110] V. Raghavan and V.V. Veeravalli. "Quickest Detection of a Change Process Across a Sensor Array." In *Proc. IEEE Fusion*, Cologne, Germany, July 2008. (**Invited.**)
- [C109] V. Raghavan, A. Sayeed and V.V. Veeravalli. "Structured Statistical Precoding for Correlated MIMO Channels." In *Proc. IEEE ISIT*, Toronto, Canada, July 2008.
- [C108] V.S. Annapureddy and V. V. Veeravalli, "Gaussian Interference Networks: Sum Capacity in the Low Interference Regime." In *Proc. IEEE ISIT*, Toronto, Canada, July 2008.
- [C107] V. Raghavan, A. Poon and V.V. Veeravalli. "Non-Robustness of Statistics-Based Beamformer Design in Correlated MIMO Channels." In *Proc. IEEE ICASSP*, Las Vegas, NV, April 2008.
- [C106] C. Lin, V. Raghavan and V.V. Veeravalli. "Limited Feedback Space-Time Coding in Correlated MIMO Channels." In *Proc. CISS*, Princeton, NJ, March 2008.
- [C105] V. Raghavan, C. Lin and V.V. Veeravalli. "Impact of Spatial Correlation on Limited Feedback

- Techniques.” In *Proc. ITA workshop, UCSD*, San Diego, CA, February 2008. **(Invited.)**
- [C104] V. S. Annapureddy and V. V. Veeravalli, “Sum Capacity of the Gaussian Interference Channel in the Low Interference Regime.” In *Proc. ITA workshop, UCSD*, San Diego, CA, February 2008. **(Invited.)**
- [C103] J. Fuemmeler and V.V. Veeravalli. “Sensor Scheduling for Effective and Energy Efficient Tracking in Sensor Networks.” In *Proc. IEEE CDC*, New Orleans, LA, December 2007. **(Invited.)**
- [C102] S.S. Ram, V.V. Veeravalli and A. Nedic. “Stochastic Incremental Gradient Descent for Estimation in Sensor Networks.” In *Proc. IEEE CAMSAP*, St. Thomas, US Virgin Islands, December 2007. **(Invited.)**
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EXTERNAL RESEARCH FUNDING

Current Research Funding

- “Alliance for IoBT Research on Evolving Intelligent Goal-driven Networks (IoBT REIGN).” *Army Research Lab.* (Team led by T. Abdelzaher.) September 14, 2017 – September 13, 2022 (extendable to 2027). Veeravalli’s portion of funding: approximately \$200K/year.
- “SpecEES: Collaborative Research: Energy Efficient Dynamic Spectrum Access in Uncoordinated Networks.” *National Science Foundation.* (with B. Chen (Syracuse).) August 1, 2017 – July 31, 2020. Veeravalli’s portion of funding: \$275K.
- “CIF: Small: Collaborative Research: Network Event Detection with Multistream Observations.” *National Science Foundation.* (Led by Veeravalli, with Y. Liang (Syracuse).) August 1, 2016 – July 31, 2019. Total funding:\$500K.
- “CIF: Medium: Collaborative Research: Quickest Change Detection Techniques with Signal Processing Applications.” *National Science Foundation.* (Led by Veeravalli, with G. Fellouris (Illinois) and G. Moustakides (Rutgers).) August 1, 2015 – July 31, 2019. Total funding: \$1.2 million.
- “Dynamic Data Driven Information Fusion For Situational Awareness,” *Air Force Office of Scientific Research.* (B. Chen, Syacuse (lead).) April 15, 2016 – April 14, 2020. Veeravalli’s portion of funding: \$240K.
- “EAGER-DynamicData: A Scalable Framework for Data Driven Real-Time Event Detection in Power Systems,” *National Science Foundation.* (With A. Dominguez-Garcia.) September 1, 2015 – August 31, 2018. Total funding: \$185K.

Past Research Funding

- “WiFiUS: Message and CSI Sharing for Cellular Interference Management with Backhaul Constraints.” Funded by the *National Science Foundation*, March 2015 - February 2018. Total funding: \$270K.
- “CIF: Large: Collaborative Research: Controlled Sensing, and Distributed Signal Processing and Decision-Making in Networked Systems.” Funded by the *National Science Foundation*, August 15, 2011 – August 15, 2017. (Collaborative proposal led by D. Teneketsis at U. Michigan and V. Veeravalli at Illinois.) Total funding : \$2.5 million
- “Collaborative Research: ATD: Advanced Quickest Multidecision Change Detection-Classification Methods for Threat Assessment in Distributed Sensing Systems,” Funded by the *National Science Foundation*, September 1, 2012 – August 31, 2016. (Collaborative proposal with A. Tartakovsky, USC.) Veeravalli’s portion of funding: \$250K.
- “Dynamic Information Collection and Fusion.” Funded by the *Air Force Office of Scientific Research*, August 15, 2010 – August 14, 2015. (Led by Veeravalli, with P. Ishwar, BU, and B. Chen, P. Varshney, Syracuse.) Total funding : \$2.5 million
- “Nonlinear Filtering and Change-point Detection Methods for Course of Action Analysis.” Funded by the *Defense Threat Reduction Agency*, August 15, 2010 – August 14, 2015. (With A. Tartakovsky (lead) and A. Galstyan, USC). Veeravalli’s portion of funding: \$650K
- “CIF: Medium: Collaborative Research: Understanding and Managing Interference in Communication Networks.” Funded by the *National Science Foundation*, July 15, 2009 – June 30, 2014. (With L. Zheng, MIT, B. Chen, Syracuse, and G. Kramer, USC.) Veeravalli’s portion of funding: \$299K
- “MIMO Links in Wireless Edge Networks: Cross-Layer Protocol Design.” Funded by the *National Science Foundation*, August 16, 2008 – August 15, 2013. (With N. Vaidya, Illinois). Total funding: \$410K.
- “MIMO Interference Networks: Capacity and Adaptive Signaling Strategies.” Funded by Intel Corporation, September 2008 - September 2011. Total funding: \$218K.

- “Collaborative Research: Optimal Change-point Detection and Identification Algorithms with Applications.” Funded by the *National Science Foundation*, August 1, 2008 – July 31, 2013. (With A. Tartakovsky, USC.) Veeravalli’s portion of funding: \$306K.
- “Interference Alignment in Wireless Networks.” Funded by Motorola, Inc, December 2010 –. Total funding: \$65K.
- “Robust Inference and Communication: Theory Algorithms and Performance Analysis.” Funded by the *National Science Foundation*, October 1, 2007 – September 30, 2011 . (With S. Meyn, Illinois.) Total funding: \$380K.
- “Spatial-Temporal Nonlinear Filtering with Applications to Information Assurance and Counter Terrorism”. Funded by the *ARO FY06 MURI Program on Spatial-Temporal Event Pattern Recognition*, May 2006 – August 2011. (Led by B. Rozovsky, Brown University.) Veeravalli’s portion of funding: \$500K
- “Adaptive Space-Time Codes for Interference Channels” Funded by *Texas Instruments*, 2007 – 2008. Total funding: \$40K.
- “Adaptive Space-Time Codes for General MIMO Channels.” Funded by *Texas Instruments*, 2006 – 2007. Total funding: \$40K.
- “Wireless Wind Tunnel: A Testbed for Experimental Evaluation of Wireless Networks.” Funded by the *National Science Foundation*, September, 2004 – August, 2009. (With Profs. N. Vaidya, J. Bernhard, R. Iyer, and P.R. Kumar, Illinois.) Total funding: \$500K (including cost sharing).
- “Communication over Dispersive Wireless Channels: Theory and Methods Based on Physical Principles.” Funded by the *National Science Foundation*, September, 2004 – August, 2008. (With Prof. A. Sayeed, U. Wisconsin.) Total funding: \$500K
- Played a lead role in obtaining a **\$3.4 million** award from the *Vodafone-US Foundation* to fund graduate and undergraduate fellowships in wireless communications at the University of Illinois from 2003-2008.
- “Design and Analysis of Sensor Networks for Statistical Inference Applications.” Funded by the *Motorola Communications Center*, Illinois. September, 2005 – August 2008. Total funding: \$180K
- “New Techniques for Optimizing the Quality and Capacity of Wireless Communication Systems.” Funded by *National Science Foundation CAREER program and PECASE award*, July 1, 1998 – June 30, 2006. Total funding: \$500K.
- “Signal Design for Broadband Multiantenna Wireless CDMA Systems.” Funded by *Lucent Technologies*. June 2002 – . Total funding: \$20K
- “An Integrated Exploration of Wireless Network Communication.” Funded by the *National Science Foundation* through the ITR program, August 1, 1999 – December 31, 2004. (With several CSL, Illinois faculty.) Total funding of \$ 2 million. Veeravalli’s portion: \$200K.
- “Design Principles for Wideband Wireless Communications.” Funded by the *National Science Foundation*, March 1, 2000 – August 31, 2003. (With Prof. T. Berger). Total funding: \$525K
- “Research at the Frontiers of the Physical Layer.” Funded by *National Science Foundation*, September 1, 1998 – August 31, 2002. (With Prof. C. Heegard.) Total funding: \$360K
- “Decentralized Dynamic Decision Making and its Applications to Wireless Communications.” Funded by the *Office of Naval Research*. June 1, 1997 – August 31, 2000. Total funding: \$175K
- “New Sequential Techniques for Code Acquisition in Wireless CDMA Systems.” Funded by the *National Science Foundation*. January 1, 1997 – December 31, 2000. Total funding: \$139K.
- “Wideband Multimedia Wireless Communications.” Funded by *Lockheed Martin Co.*, May 20, 1999 – August 31, 2000. Total funding: \$25K.
- “Radio Resource Management for Third Generation CDMA Systems.” Funded by *Nortel External Research*. April 20, 1998 – July 25, 2000. Total funding: \$41K.
- “Capacity, Coverage and Soft Handoff Analysis for Cellular CDMA Systems.” Funded by *Nortel External Research*. December 10, 1996 – December 10, 1997. Total funding: \$30K.

Equipment Grants and Donations

- “Drive Test Products for Illinois Center for Wireless Systems (ICWS) Lab.” *Agilent Technologies*, 2009. Value: \$198K.
- Wireless LAN equipment for the Cornell ROBOCUP project. *Raytheon*, 2000. Value: \$8K.
- “Companion 200 pico-cellular communication system testbed for WiSE laboratory.” *Nortel External Research*, 1998. Value: \$20K.
- “Arbitrary Waveform Generator and High Speed Digitizing Oscilloscope.” *Tektronix Foundation*, 1999. Value: \$27K.
- “Equipment grant for WiSE laboratory” *AT&T Foundation*, 1996. Value:\$15K.

ADVISING

Postdoctoral Associates

- **Shaofeng Zou**, Ph.D. Syracuse University, July 2016- present.
- **Sirin Nitinawarat**, Ph.D. University of Maryland, January 2012 - September 2014. Now with Qualcomm.
- **George Atia**, Ph.D. Boston University, September 2009 - August 2012. Now an Assistant Professor with University of Central Florida.
- **Vasanthan Raghavan**, Ph.D. U. Wisconsin, Madison, August 2006 - August 2009. Now with Qualcomm.
- **Jun Chen**, Ph.D. Cornell University. September 2005 - July 2006. Now an Associate Professor with McMaster University.
- **Wei Zha**, Ph.D. Queens University. December 2003 - January 2005. Now with a Sr. DSP Engineer with PCTEL.

Ph.D. Students

- **Aditya Deshmukh**. Currently working on Ph.D. thesis. Expected completion date: August 2020.
- **George Rovatsos**. Currently working on Ph.D. thesis. Expected completion date: December 2019.
- **Yuheng Bu**. Currently working on Ph.D. thesis. Expected completion date: August 2019.
- **Meghana Bande**. Currently working on Ph.D. thesis. Expected completion date: December 2018.
- **Jonathan Ligo**. Ph.D., August 2017. Thesis title: “Detection of Sparse Mixtures: Fundamental Limits and Algorithms.” Now with Applied Physics Laboratory.
- **Craig Wilson**. Ph.D., August 2016. Thesis title: “Adaptive Sequential Optimization and its Applications to Machine Learning.” Now with Google.
- **Yun Li**. Ph.D., August 2015. Thesis title: “Universal Outlier Hypothesis Testing with Application to Anomaly Detection.” Now with Walmart Labs.
- **Taposh Banerjee**. Ph.D., August 2014. Thesis title: “Data-Efficient Quickest Change Detection.” Now a postdoctoral associate at Harvard University.
- **Aly ElGamal**. Ph.D., May 2014. Thesis title: “Interference Channels with Coordinated Multipoint Transmission.” Now an Assistant Professor at Purdue University.
- **V. Sreekanth Annapureddy**. Ph.D., September 2011. Thesis title: “Interference Management in Wireless Networks.” Now with NetraDyne, San Diego, CA.
- **Jayakrishnan Unnikrishnan**. Ph.D., August 2010. Thesis title: “Decision-Making Under Statistical Uncertainty.” Now with GE Research Labs.
- **S. Sundhar Ram**. Ph.D., December 2009. Thesis title: “Distributed Optimization in Multi-Agent Systems: Applications to Distributed Regression.” Now with Facebook.
- **Jason Fuemmeler**. Ph.D., October 2008. Thesis title: “Energy-Efficient Tracking in Sensor Networks.” Now with Rockwell Collins.
- **Che Lin**. Ph.D., August 2008. Thesis title: “Multiantenna Communication in the Presence of Feedback.” Now an Associate Professor at National Tsing Hua University, Taiwan.
- **Yingbin (Grace) Liang**. Ph.D., August 2005. Thesis title: “Multiuser Communications with Relaying and User Cooperation.” Now an Associate Professor at Ohio State University.

- **Jean-Francois Chamberland.** Ph.D., August 2004. Thesis title: “Design of Sensor Networks for Detection Applications via Large Deviation Theory.” Now an Associate Professor at Texas A&M University.
- **Rajat Prakash.** Ph.D., October 2003. Thesis title: “Centralized Wireless Systems with User Arrivals and Departures.” Now with Qualcomm, San Diego, CA.
- **Swaroop Appadwedulla.** Ph.D., May 2003. (Co-advised with Douglas Jones.) Thesis title: “Energy-Efficient Sensor Networks for Detection Applications.” Now with Lincoln Labs, Boston, MA.
- **Ashok Mantravadi.** Ph.D., January, 2002, Cornell University. Ph.D. thesis title: “Analysis and Design of Wideband Multiantenna CDMA Systems.” Now with Qualcomm, Inc.
- **Mehul Motani.** Ph.D., August 2000, Cornell University. (Co-advised with Chris Heegard.) Thesis title: “Information Theory and Coding for CDMA Systems.” Now a Professor with National University of Singapore.

M.S. Students

- **Yuheng Bu.** M.S. December 2016. Thesis title: “Estimation of KL divergence: Optimal minimax rate.”
- **George Rovatsos.** M.S. August 2016. Thesis title: “Quickest Change Detection with Applications to Line Outage Detection.”
- **Neeraj Venkatesan.** M.S. May 2015. Thesis title: “Distributed Optimization on a Sensor Network Testbed.” Now with Northrup Grumman, El Segundo, CA.
- **Meghana Bande.** M.S. May 2015. Thesis title: “Flexible Backhaul Design with Cooperative Transmission in Cellular Networks.”
- **Jonathan Ligo.** M.S., December 2013. Thesis title: “Controlled Sensing Approach to Graph Classification.”
- **Kyle Harris.** M.S., May 2013. Thesis title: “Wireless Sensor Network Implementations on a Testbed Platform.” Now with Viavi Solutions, Indianapolis, IN.
- **Craig Wilson.** M.S., December 2011. Thesis title: “Communications Strategies for the MIMO Interference Channel.” Now with Google.
- **V. Sreekanth Annapureddy.** M.S., August 2008. Thesis title: “Gaussian Interference Channel in the Low Interference Regime.” Now with NetraDyne, San Diego, CA.
- **Jayakrishnan Unnikrishnan.** M.S., October 2007. Thesis title: “Cooperative Sensing for Primary Detection in Cognitive Radio.” Now with GE Research Labs.
- **Arun Visvanathan.** M.S., August 2005. Thesis title: “Sleeping Policies for Energy Efficient Tracking in Sensor Networks.” Now with Qualcomm, San Diego, CA.
- **Jason Fuemmeler.** M.S., October, 2004. Thesis title: “Power Control for Ad Hoc Wireless Networks.” Now with Rockwell Collins.
- **Batu Sat.** M.S., October 2003. Thesis title: “Grouping Strategies for Cellular CDMA Systems.” Now Cofounder & CEO at Mall IQ, Inc.
- **K. Chaitanya Reddy.** M.S., May, 2003. Thesis title: “Coding Spreading Tradeoff for Multiple Antenna Systems Using Convolutional Codes.” Now with Qualcomm, San Diego, CA.
- **Jean-Francois Chamberland.** M.S., August 2000, Cornell University. Thesis title: “Analysis and Design of Power Control Algorithms for CDMA Systems.” Now an Associate Professor at Texas A&M University.

- **Rajat Prakash.** M.S., August 1999, Cornell University. Thesis title: “Analysis and Design of Handoff Algorithms.” Now with Qualcomm, San Diego, CA.
- **Ashok Mantravadi.** M.S., January, 1999, Cornell University. Thesis title: “On Acquisition and Detection in Asynchronous Band-limited CDMA Systems.” Now with Qualcomm, Inc.

Undergraduate Research Projects (last five years)

- **Arthur Lee** “Sensor Network Testbed.” Summer 2016, Fall 2016.
- **Kenneth Zhang** “Sensor Network Testbed.” Summer 2016, Fall 2016.
- **Christopher Dunaway** “Implementing Sequential Learning Algorithms.” Summer 2015.
- **Isaac Kousari** “Sensor Network Testbed.” Summer 2015.
- **Nathan Beachamp** “Sensor Network Testbed.” Summer 2015.
- **Daniel Whisman.** “Sensor Network Testbed.” Fall 2013, Spring 2014.
- **Chen Luo.** “Sensor Network Testbed.” Fall 2013.
- **Mo Deng.** “Adaptive Sampling for Estimation in Sensor Networks.” Fall 2012, Spring 2013.
- **Dario Aranguiz.** “Setting up Sensor Network Testbed.” Fall 2011 – Spring 2013.
- **Manan Agarwal.** “Setting up ICWS Lab using Agilent Test Drive Equipment.” Spring 2010.
- **Jerome Han.** “Setting up ICWS Lab using Agilent Test Drive Equipment.” Spring 2010.
- **KyunkSik Choi.** “Setting up ICWS Lab using Agilent Test Drive Equipment.” Spring 2010.

TEACHING ACTIVITIES

Awards

List of Teachers Ranked as Excellent by their Students, University of Illinois, Spring 2007, Fall 2007, Spring 2010, Fall 2010 (two courses), Spring 2012, Fall 2013, Spring 2013, Spring 2014, Spring 2015, Fall 2015, Spring 2016, Spring 2017 (two courses).

Michael Tien Excellence in Teaching Award, College of Engineering, Cornell University, 1999.

University of Illinois at Urbana-Champaign

- ECE 398BD (Spring 2015, Spring 2016, Spring 2017): Making Sense of Big Data
- ECE 313 (Fall 2012, Fall 2014): Probability with Engineering Applications
- ECE 361 (Spring 2013): Digital Communication
- ECE 562 (Fall 2010, 2011, 2013, 2015, 2016): Advanced Digital Communication
- ECE 534 (Spring 2008, Fall 2009, Spring 2016): Random Processes
- ECE 559 (Fall 2007): Wireless Communication
- ECE 461 (Fall 2006): Communication Systems II
- ECE 563 (Fall 2005, 2010): Information Theory
- ECE 459 (Spring 2003): Communication Systems I
- ECE 561 (Spring 2002, 2006, 2007, 2010, 2012, 2014, 2015, 2017): Detection and Estimation Theory
- ECE 471VV (Spring 2001): Wireless Communication Networks
- ECE 559 (Fall 2000): Communication Systems III

Cornell University

- EE 467 (Fall 1997, 1998, 1999): Communication Systems 1 (*Introduced by VVV*)
- EE 568 (Spring 1997, 1998, 1999): Mobile Communication Systems (*Introduced by VVV*)
- EE 564 (Fall 1996): Signal Detection and Estimation
- EE 311 (Spring 1998): EE Honors Seminar
- EE 595 (Fall 1996): Wireless Information Technology Seminar

Rice University

- Elec 630 (Spring 1996): Advanced Topics—Wireless Communications (*Introduced by VVV*)
- Elec 301 (Fall 1994, 1995): Introduction to Signals and Systems
- Elec 535 (Spring 1995): Information and Coding Theory
- Elec 697 (Spring 1995): Information-Theoretic Signal Processing—Graduate seminar course

Nortel Networks

- Summer 1995: Communication Theory—A detailed overview of information theory, coding theory and modulation, with emphasis on multiple-access communications

City University of New York

- EE 311 (Spring 1994): Communication Engineering I
- EE 5771 (Fall 1993): Statistical Communication Theory

University of Illinois at Urbana-Champaign (as student)

- ECE 461 (Spring 1992): Signal Detection and Estimation

INVITED TALKS AT UNIVERSITIES, CONFERENCES AND INDUSTRY (last five years)

- “Quickest Change Detection under Transient Dynamics”
 - **Indian Institute of Science**, Bangalore, ECE Department Seminar, January 2018
- “Interference Management and Backhaul Design in Wireless Networks via a DoF Analysis”
 - **IEEE COMSNETS**, Bangalore, January 2018. **Keynote Lecture.**
- “Quickest Change Detection under Transient Dynamics”
 - **Princeton University**, EE Department Seminar, November 2017
- “Quickest Change Detection under Transient Dynamics”
 - **Cornell Tech**, ECE Department Seminar, November 2017
- “Quickest Change Detection under Transient Dynamics”
 - **Syracuse University**, ECE Department Seminar, October 2017
- “Quickest Change Detection under Transient Dynamics”
 - **International Workshop on Sequential Methodologies (IWSM)**, Rouen, France, June 2017
- “Adaptive Sequential Learning”
 - **BASARFEST: Workshop on Games, Teams, and Decisions**, Las Vegas, NV, December 2016.
- “Detection of Sparse Mixtures: The Finite Alphabet Case.”
 - **IEEE Asilomar Conference on Signals, Systems and Computers**, Pacific Grove, CA, November 2016.
- “Adaptive Sequential Learning”
 - **IEEE Asilomar Conference on Signals, Systems and Computers**, Pacific Grove, CA, November 2016.
- “Efficient Learning from Data”
 - **Syracuse University**, ECE Department Seminar, October 2016.
- “Sum rate maximizing joint processing with limited backhaul and tree topology constraints”
 - **IEEE International Workshop on Signal Processing Advances in Wireless Communications (SPAWC)**, Edinburgh, UK, July 2016.
- “Quickest Detection and Isolation of Line Outages in Power Systems with Transient Dynamics”
 - **International Workshop on Applied Probability (IWAP)**, Toronto, Canada, June 2016.
- “Efficient Learning from Data”
 - **Rutgers University**, Data Science Seminar, May 2016.
- “Quickest Detection and Isolation of Line Outages in Power Systems”
 - **University of Iowa**, ECE Department Seminar, April 2016.
- “Rate Analysis for Detection of Sparse Mixtures”
 - **ITA workshop**, San Diego, CA, February 2016.
- “Quickest Detection and Isolation of Line Outages in Power Systems”
 - **Rutgers University**, ECE Department Seminar, November 2015.
- “Universal Quickest Outlier Detection and Isolation.”
 - **Conference on Applied Stochastic Models and Data Analysis (ASMDA)**, Athens, Greece, July 2015.
- “Quickest Detection and Isolation of Line Outages in Power Systems”
 - **International Workshop on Sequential Methodologies (IWSM)**, New York, June 2015.
- “Quickest Change Detection”
 - **Boston University**, ECE Department Seminar, April 2015.

- “Flexible Backhaul Design for Cellular Interference Management”
 - **ICNC**, Anaheim, CA, February 2015. (**Plenary.**)
- “Learning a Sequence of Slowly Varying Tasks”
 - **ITA workshop**, San Diego, CA, February 2015.
- “Dynamic Stochastic Optimization”
 - **IEEE CDC**, Los Angeles, CA, Dec 2014.
- “Flexible Backhaul Design for 5G Cellular Interference Management”
 - **5G North America (5GNA) Workshop**, Asilomar, Pacific Grove, CA, November 2014.
- “Universal Sequential Outlier Hypothesis Testing”
 - **Asilomar Conference on Signals, Systems and Computers**, Pacific Grove, CA, November 2014.
- “Data-Efficient Quickest Change Detection”
 - **Georgia Tech**, ISyE Colloquim, March 2014.
- “Universal Outlying Sequence Detection”
 - **IMSE Symposium**, University of Illinois, February 2014.
 - **UCSD ITA Workshop**, San Diego, CA, February 2014.
- “Data-Efficient Quickest Change Detection”
 - **University of California, Davis**, ECE Department Colloquium, October 2013.
- “Universal Outlier Hypothesis Testing”
 - **Control and Cognition Workshop**, U. Florida, Gainesville, January 2014.
- “Controlled Sensing for Multihypothesis Testing”
 - **International Workshop on Sequential Methodologies (IWSM)**, Athens, GA, July 2013.
- “Data-Efficient Quickest Change Detection”
 - **University of Maryland**, Advanced Networks Colloquium, April 2013.
- “Universal Outlier Hypothesis Testing”
 - **NSF Workshop on Signal Processing for Big Data**, Arlington, VA, March 2013.

PERSONAL

Married, US Citizen