# KRISHNA R. NARAYANAN

**Work Address :**
Department of Electrical Engineering, WERC 334M
Texas A&M University,
College Station, TX 77843
Phone : (979)862-2691
Fax : (979)862-4630
Email: krn@tamu.edu
Home page: http://krishnanarayanan.wikidot.com

**Home Address :**
213 Cecilia Ct,
College Station,
TX 77845, USA

**Education**

**Ph.D. in Electrical Engineering**, Dec 1998
Georgia Institute of Technology, Atlanta, GA

**M.S. in Electrical Engineering**, Aug 1994
Iowa State University, Ames, IA
Recipient of a Professional Progress in Engineering Outstanding Alumnus Award in 2014

**B.S. in Electrical Engineering**, May 1992
Coimbatore Institute of Technology, India
Ranked First out of 47 Students

**Work Experience**

*August 2016 to Present* - **Eric D. Rubin '06 Professor**, Department of Electrical and Computer Engineering, Texas A&M University, College Station, TX 77843

*September 2008 to Present* - **Professor**, Department of Electrical and Computer Engineering, Texas A&M University, College Station, TX 77843

*July 2012 to Dec 2014* - **Director of Graduate Studies**, Department of Electrical and Computer Engineering, Texas A&M University, College Station, TX 77843

*September 2003 to August 2008* - **Associate Professor**, Department of Electrical and Computer Engineering, Texas A&M University, College Station, TX 77843

*December 1998 to August 2003* - **Assistant Professor,** Department of Electrical and Computer Engineering, Texas A&M University, College Station, TX 77843

*June '95 to September '95* - **Summer Intern,** AT&T Bell Laboratories, Crawford Hill Laboratory, NJ 07733

**Visiting Positions**

January 2015 to May 2015, Department of Electrical Engineering and Computer Science, University of California at Berkeley.

January 2005 to May 2005, Institut Eurecom, Sophia Antipolis, France

August 2004 to December 2004, Department of Electrical and Computer Engineering, University of Illinois at Urbana Champaign

**Teaching**

- Courses developed
  - Graphical Models and Inference
  - Advanced topics in channel coding - a graduate course on the fundamentals of codes on graphs and iterative decoding (taught online through TTVN once)
  - Wireless Communications - upgraded the graduate level wireless communications course with emphasis on recent developments
- Courses taught - Channel coding for communications, Advanced Channel Coding, Information theory, Wireless communications, Digital Communications, Modulation Theory, Signals and Systems

**Main Research areas**

- Coding theory and information theory
- Applications to 5G wireless and Internet of Things
- Signal processing for big data
- Non-volatile memories and other emerging paradigms in data storage

**Student Supervision**

- Graduated Students - 15 Ph.D., 4 Ph.D. students were co-advised with other professors, 10 M.S students
- Current Students - 4 Ph.D.

**Editorial Positions**

- Associate Editor, Coding Techniques, IEEE Transactions on Information Theory, 2015-2018
- Area Editor, Coding Theory and Applications, IEEE Transactions on communications, 2007 - 2011
- Editor, IEEE Transactions on communications, 2005 - 2011
- Editor, IEEE Transactions on Wireless Communications, 2001 - 2005
- Associate editor for IEEE communications letters, 2000 - 2003

**Honors**

- Fellow of IEEE
- Outstanding Professor award, Department of Electrical & Computer Engg, Texas A&M University, Dec 2015
- Dean's excellence award, College of Engineering at Texas A&M University, May 2015
- Recipient of the Professional Progress in Engineering (Alumni award given to outstanding alumni under the age of 46) from Iowa State University, Ames, IA, April 2014
- Recipient of the Association of Former Students teaching award, Texas A&M University, 2012
- Recipient of the 2011-2012 William Keeler fellow award from the College of Engineering, Texas A&M University.
- Recipient of 2009 Halliburton fellowship from the College of Engineering, Texas A&M University.

- Recipient of the 2007 Best Paper Award from the IEEE Signal Processing for Data Storage society
- Outstanding Professor Award, Department of Electrical Engineering, Texas A&M University, 2002
- Faculty early CAREER development award, National Science Foundation, 2001
- Select Young Faculty Award within College of Engineering at Texas A&M University, 2001
- Nominated for Montague Teaching Excellence Award at Texas A&M University from Dept. of Electrical Engineering in Year 2001 (did not receive the award)
- Recipient of Harpole, Palmer and Litton Graduate Fellowship from the Dept. of Electrical Engineering, Iowa State University, Ames, IA
- Recipient of the Premium for Academic Excellence award from Graduate College, Iowa State University, Ames, IA
- Member of Phi Kappa Phi (1994-95)
- Graduated at the top of the class in bachelor's degree

**Externally Sponsored Research**

1. PI - K.R. Narayanan, Qualcomm faculty award, $75,000, 2017
2. PI - A. Jiang, Co-PIs - K.R. Narayanan and J. Bruck, "CIF: Small: Collaborative Research: Error Correction with Natural Redundancy", National Science Foundation, $299,999 (only the TEES portion), Oct 1 2017 - Sept 31, 2020.
3. PI - K.R. Narayanan, Co-PIs - H.D. Pfister and G. Choi, "Collaborative Research: Advanced Coding Techniques for Next-Generation Optical Communications, National Science Foundation, $366,765, Sept. 15, 2016 - Sept 14, 2019
4. PI - K.R. Narayanan, Co-PIs - J.-F. Chamberland and P.R. Kumar, "CIF Small: Massive Uncoordinated and Sporadic Multiple Access - Strengthening Connections between Coding and Random Access, National Science Foundation, $495,010, June 15, 2016 - June 14, 2019
5. PI - K.R. Narayanan, Co-PIs - A. Karsilayan, E. Serpedin and J. Silva-Martinez, "EARS: Enhancing Radio-Frequency Spectrum Through Interference Resilient Cognitive Radio Systems: Design, Performance Analysis and Optimization", National Science Foundation, $407,334, October 1, 2015 - September 31, 2018
6. PI - A. L. N. Reddy, Co-PI K.R. Narayanan and P. Gratz, "I/URC Phase II: Center on Intelligent Storage", National Science Foundation, $300,000, September 15, 2014 - August 31, 2019
7. PI - M. Smotherman, Senior Personnel - K.R. Narayanan, "Networking Strategies used by Bats to Improve Social Sonar", National Science Foundation, $660,000 (pro-rated amount $30,433), August 15, 2014 to August 14, 2017
8. PI - B. Nazer, Co-PI - K. R. Narayanan (TEES PI) and B. Aazhang, "CIF: Medium: Collaborative Research: Interference-Aware Cooperation via Structured Codes", National Science Foundation, $1,086,558, May 1, 2013 to April 1, 2017
9. PI - H. Pfister, Co-PI - K.R. Narayanan, "CIF:Small: Design and Analysis of Spatially-Coupled Coding Systems", National Science Foundation, $494,231, August 1, 2013 to July 31, 2016

10. PI - J. Boutros, Co-PI - K.R. Narayanan and E. Viterbo, "Information Processing via Lattices in Digital Data Networks", Qatar National Research Foundation, $1,045,374, October 15, 2012 - October 14, 2015
11. PI - A. Ruimi, Co-PI - K. R. Narayanan, M. Fratarcangeli, B. Nour, J. N. Reddy and A. R. Srinivasa, "Surgical Thread Simulation Using a Novel Information-Theory Approach", Qatar National Research Foundation, $1,040,321, October 15, 2012 - October 14, 2015
12. PI - K.R. Narayanan, co-PI - H.D. Pfister, "Coding for Fiber-Optic Communication", Xilinx Inc, $100,000, Sept 1, 2011 - May 31, 2013
13. PI - K.R. Rajagopal, Co-PI's - A.R. Srinivasa, J. Criscione and K.R. Narayanan, "CDI Type II/Collaborative Research: A New Approach to the Modeling of Clot Formation and Lysis in Arteries", National Science Foundation, $875,165, (Pro-rated amount - $214,114), Sept 1, 2010 - Aug 31, 2013
14. PI - J.F. Chamberland, Co-PI's - H.D. Pfister and K.R. Narayanan, "Fundamental Limits on Delay Constrained Communications", National Science Foundation, $ 300,000, Sept 1, 2008 - Aug 31, 2011
15. PI - X. Zhang, Co-PIs - K.R. Narayanan (TEES PI), H. D. Pfister, "GOALI : Advanced Coding and Signal Processing for Magnetic Recording: From Theory to Implementation", National Science Foundation, $175,000 (dollar amount awarded to Texas A&M University), May 1 2008 - April 31 2011
16. PI - M.S. Alouini, Co-PIs - K.R. Narayanan, H. D. Pfister, and K. Qaraqe, "Universal Signaling Schemes for Multimedia Transmission over Wireless Networks", Qatar National Research Foundation, $575,100, January 2008-December 2010
17. PI - K.R. Narayanan, "Joint Source-Channel Coding for Wireless Networks", National Science Foundation, $300,000, September 2007 - August 2010
18. PI - A. R. Srinivasa, Co-PIs - J. Froyd, A. Jayaraman, D. Maxwell, K.R. Narayanan, "CCLI Phase I: An Engineering Emphasis for Preparing Students for First-year Engineering Curricula", National Science Foundation, $200,000, June 2009 - May 2011
19. PI - K.R. Narayanan, Co-PI H. D. Pfister, "Soft Decision Decoding of Reed Solomon Codes for High Density Recording Channels", International Storage Industry Consortium, $32,000, January 2007 - December 2007
20. PI - K.R. Narayanan, "Understanding and Mitigating Error Floors in Iterative Decoding with Applications to Magnetic Recording", International Storage Industry Consortium, $30,000, Jan 2006 - December 2006
21. PI - K.R. Narayanan, "Universal Source and Channel Codes for Non-Ergodic Channels", National Science Foundation, $189,586, Sept. 2005 - Aug 2008
22. PI - K.R. Narayanan, "Low Complexity Iterative Decoding for Digital Magnetic Recording", Seagate Research Inc, Pittsburgh, $75,106, 01/04-12/05.
23. PI - K.R. Narayanan, "Coding for Long Haul Optical Networks", Azea Networks, United Kingdom, $45,000, Jan 01, 2004 to Dec 31, 2004
24. PI - K.R. Narayanan, CAREER award "Design and Analysis of Iteratively Decodable Codes for Wireless Communications and Digital Magnetic Recording", National Science Foundation, $300,000, Feb 01, 2001 - Jan 31, 2007

25. PI - K. R. Narayanan, "Low Density Parity Check Codes and Turbo-Like Codes for Wireless Communications", National Science Foundation, $179,925, 09/01/2000 - 08/31/2003
26. PI - K.R. Narayanan, "Advanced Coding Techniques and Low Complexity Decoding for Wireless Data Networks", Advanced Technology Program, Texas Higher Education coordinating Board, $72,600, 01/01/00-12/31/01
27. PI - K. R. Narayanan, " Low Density Parity Check Codes for High Order Signal Constellations", Tadiran Microwave Networks, $38,000, 06/01/00-12/01/01
28. PI - K.R. Narayanan, "Low Complexity Iterative Decoding for Digital Magnetic Recording", Seagate Research Inc, Pittsburgh, $80,106, 01/02-12/03
29. PI - K. R. Narayanan, "Concatenated Coding and Iterative Decoding", Rockwell Collins University Grants Program, $41,500, 09/01/00-05/01/02
30. PI - K.R. Narayanan, "Research in Turbo Coding", GS Labs, $16,000
31. PI - K. R. Narayanan, "Low Density Parity Check Codes for Wireless Communications", Texas Instruments, $20,000, 09/01/00-08/31/01
32. PIs - C.N.Georghiades, S.Miller, K.Narayanan, & X. Wang, "Space-Time Processing", Motorola Inc, Austin, $60,000, 01/01/2000-01/01/2001
33. PI - G. Choi, Co-PI - K.R. Narayanan, "ASIC Design and Implementation of Advanced Coding Techniques for Wireless Data Networks",Advanced Technology Program, Texas Higher Education coordinating Board, $142,600, 01/01/02-12/31/03

**Internally Sponsored Research**

1. PI - C.N. Georghiades, Co-PIs - S.Miller, K.Narayanan, E. Serpedin, X. Wang, Z. Xiong and B. Zoghi, "Advanced Algorithms for High Speed Wireless Networks", Telecommunications Infrastructure & Technology Fund, Texas A&M University, $485,000, 08/01/01 - 07/31/04

**Book Chapters**

1. K.R. Narayanan, Turbo Equalization, in Wiley Encyclopedia on Telecommunications, Editor - J.G. Proakis, Wiley, 2003
2. J. Li, E. Kurtas and K.R. Narayanan, Turbo Product Codes for Partial Response Channels, in CRC Handbook, CRC Press

**Tutorials**

- "The Peeling Decoder : Theory and Applications", Tutorial presented at the 2017 Australian School on Information Theory, Australian National University, Jan 18, 2017
- "The Peeling Decoder : Theory and Applications", Tutorial presented at the North American School of Information Theory, Duke University, June 21, 2016
- Low Density Parity Check Codes, IEEE WCNC 2004
- Low Density Parity Check Codes, 2005, IEEE Web-based tutorial
- EXIT Charts: Properties, Extensions and Applications, Indian Institute of Science, 2005

**Patents**

1. K.R. Narayanan, J. Jiang and N. Nangare, "Iterative decoding of linear block codes by adapting the parity check matrix", U.S. Patent 7519898, April 2009

2. H.-J. Tarn, K.R. Narayanan, R.M. Rao, R. N. Mazareh, "Circuitry and method for forward error correction", U.S. Patent 9009577B1, April 2015

**Journal Publications Published and Submitted**

1. Y.-C. Huang, K.R. Narayanan, and P.-C. Wang, "Lattices over Algebraic Integers with an Application to Compute-and-Forward", *to appear in IEEE Trans. Info. Theory*, 2018
2. Y.-C. Huang, K.R. Narayanan, "Construction $\pi_A$ and $\pi_D$ Lattices: Construction, Goodness, and Decoding Algorithms", *IEEE Transactions on Information Theory*, pp. 5718-5733, Vol. 63, No. 9, Sept. 2017
3. Y.-Y. Jian, H.D. Pfister and K.R. Narayanan, "Approaching Capacity at High Rates using Iterative Hard-Decision Decoding", *IEEE Transactions on Information Theory*, pp. 5752-5773, Vol. 63, No. 9, Sept. 2017
4. Y.-C. Huang, K.R. Narayanan and T. Liu, "Coding for Parallel Gaussian Bidirectional Channels: A Deterministic Approach", *IEEE Transactions on Information Theory*, pp. 260-271, Vol. 62, No. 1, Jan. 2016
5. Y.Wang, K.R. Narayanan and Y.-C. Huang, "Concatenations of Polar Codes with Outer BCH and Convolutional Codes", *IEEE Journal of Selected Areas in Communication*, pp. 267-277, Vol. 33, Nov. 2015
6. E. Tunali, Y.-C. Huang, J. Boutros and K.R. Narayanan, "Lattices over Eisenstein Integers for Compute-and-Forward", *IEEE Transactions on Information Theory*, pp. 5306-5321, Vol. 61, No. 10, Oct. 2015
7. P.-C. Wang, Y.-C. Huang, and K.R. Narayanan, "Asynchronous Physical Layer Network Coding", *IEEE Journal of Selected Areas in Communication*, pp. 309-322, Vol. 33, No. 2, 2015
8. B. Hern and K.R. Narayanan, "Multilevel Coding Schemes for Compute-and-Forward with Flexible Decoding", *IEEE Transactions on Information Theory*, pp. 7613-7631, Vol. 59, No. 11, Nov. 2013
9. Y.-C. Huang, N. E. Tunali and K.R. Narayanan, "A Compute-and-Forward Scheme for Gaussian Bi-Directional Relaying with Inter-Symbol Interference", *IEEE Transactions on Communications*, pp. 1011-1019, Vol. 61, No. 3, March 2013
10. A. Khisti, B. Hern and K.R. Narayanan, "On Modulo-Sum Computation over an Erasure Multiple Access Channel", *IEEE Transactions on Information Theory*, pp. 4129-4138, Vol. 59, No. 7, Aug. 2013
11. A. Yedla, H.D. Pfister and K.R. Narayanan, "Code Design for the Noisy Slepian-Wolf Problem", *IEEE Transactions on Communications*, pp. 2535-2545, Vol. 61, No. 6, June 2013
12. Y.C. Huang and K.R. Narayanan, "Joint Source-Channel Coding with Correlated Interference", *IEEE Transactions on Communications*, pp. 1315-1327, Vol. 60, No. 5, May 2012
13. K.R. Narayanan and A. R. Srinivasa, "A Shannon Entropy based Non Equilibrium 'Entropic' Temperature of a General Distribution", *in Physical Review Letters E*, pp. 031151-1-031151-11, Vol. 85, No. 3, March 2012

14. S. Doraiswamy, K.R. Narayanan and A. R. Srinivasa, "Finding Minimum Energy Configurations for Constrained Beam Buckling Problems using the Viterbi Algorithm", *International Journal of Solids and Structures*, pp. 289-297, Vol. 49, No. 2, Jan. 2012
15. P.S. Nguyen, H. Pfister and K.R. Narayanan, "A Rate Distortion Perspective on Multiple Error and Erasure Decoding of Reed Solomon Codes", *IEEE Transactions on Information Theory*, pp. 668-691, Vol. 57, No. 2, February 2011
16. M. P. Wilson, K.R. Narayanan, H. Pfister and A. Sprintson, "Joint Physical Layer and Network Coding for Bi-Directional Relaying", *IEEE Transactions on Information Theory*, pp. 5641-5654, Vol. 56, No. 11, November 2010
17. M. P. Wilson, K.R. Narayanan and G. Caire, "Joint Source-Channel Coding with Side Information using Hybrid Digital Analog Codes", *IEEE Transactions on Information Theory*, pp. 4922-4940, Vol. 56. No. 10, October 2010
18. K. Bhattad and K.R. Narayanan, "A Note on the Rate of Decay of Mean-Square Error with SNR for the AWGN Channel", *IEEE Transactions on Information Theory*, pp. 332-335, Vol. 56, No. 1, January 2010
19. K.R. Narayanan and A. R. Srinivasa, "Using discrete optimization algorithms to find minimum energy configurations of slender cantilever beams with non-convex energy functions", *Mechanics Research Letters*, Pages 811-817, September 2009
20. J. Jiang and K.R. Narayanan, "Bit Level Algebraic Soft Decision Decoding", *IEEE Transactions on Information Theory, 2008*, Vol. 54, No. 9, pp. 3907-3928, September 2008
21. K. Bhattad, K.R. Narayanan, and G. Caire, "On the Distortion Exponent of Some Layered Transmission Schemes",*IEEE Transaction on Information Theory*, Vol. 54, No. 7, pp. 2943-2958, July 2008
22. G. Caire and K.R. Narayanan, "On the Distortion SNR Exponent of Hybrid Digital Analog Space Time Coding", *IEEE Transactions on Information Theory*, pp. 2867-2877, Vol. 53, No. 8, August 2007
23. K. Bhattad and K.R. Narayanan, "An MSE Based Transfer Chart for Analyzing Iterative Decoding Schemes", *IEEE Transaction on Information Theory*, pp. 22-38, Vol. 53, No. 1, Jan 2007
24. B. J. Peiris, K. R. Narayanan and S. L. Miller, " A Reduced Complexity Spectral Domain Approach to Design Spreading Sequences for DS-CDMA Systems in Frequency Selective Fading Channels, " *IEEE Transactions on Wireless Communications*,pp. 2386-2395, Vol. 5, No. 9, Sept 2006
25. J. Jiang and K. R. Narayanan, "Iterative Soft Input Soft Output Decoding of Reed-Solomon Codes", *IEEE Transactions on Information Theory*, pp. 3746-3756, Vol. 52, No.8, August 2006
26. C. F. Lan, Z. Xiong and K.R. Narayanan, "Source-optimized Irregular Repeat Accumulate Codes with Inherent Unequal Error Protection Capabilities and Their Application to Scalable Image Transmission", *IEEE Tran. Image Processing*, pp. 1740-1750, Vol. 52, No. 7, July 2006
27. K. Bhattad and K. R. Narayanan, "A Decision Feedback Based Scheme for Slepian-Wolf Coding of Sources With Hidden Markov Correlation," *IEEE Communications Letters*, pp. 378-380, Vol. 10, No. 5, May 2006

28. N. Nangare, X. Yang, E. Kurtas and K.R. Narayanan, "Performance of BCJR-DFE Detectors Over Recording Channels Using Pattern-Dependent Noise Prediction", *IEEE Tran. Magnetics*, pp. 2971-2973, vol. 41, no. 10, Oct. 2005

29. N.D. Doan, and K.R. Narayanan, "Design of Good Low Rate Codes for ISI Channels Based on Spectral Shaping", *IEEE Tran. Wireless Comm*, vol. 4, no. 5, pp. 2309-2317, Sept. 2005

30. H. Sankar and K.R. Narayanan, "Design of irregular repeat accumulate codes for OFDM systems with partial channel state information", *IEEE Tran. Wireless Communications*, pp. 2491-2497, Vol. 5, No. 4, Sept. 2005

31. X. Wang, G. Yue and K.R. Narayanan, "Optimization of LDPC Coded Turbo CDMA Systems", *IEEE Transactions on Signal Processing*, Vol. 53, No. 4, pp. 1500-1510, April 2005

32. K.R. Narayanan, X. Wang and G. Yue, " Estimating the PDF at the Output of the SIC/MMSE Equalizer and Its Applications in Designing LDPC Codes" *IEEE Tran. Wireless Communications*, Vol. 4, No. 1, pp. 278-287, Jan. 2005

33. J. Li, K.R. Narayanan and C.N. Georghiades, "An Efficient Algorithm to Compute the Euclidean Distance Spectrum of a General Intersymbol Interference Channel and Its Applications", *IEEE Tran. Communications*, Vol. 52, No. 12, pp. 2041-2046, Dec. 2004

34. H. Sankar and K.R. Narayanan, "Memory Efficient Implementation of Low Density Parity Check Codes", *in IEEE Tran. Communications*, vol. , no. , pp. 1225-1230, Aug. 2004

35. C. F. Lan, T. Chu, K.R. Narayanan and Z. Xiong, "Scalable Image Transmission Using Rate Compatible Irregular Repeat Accumulate Codes",*IEEE Tran. Communications*, vol. 52, no. 7, pp. 1092-1101, July 2004

36. J. Jiang and K.R. Narayanan,"Iterative Soft Decision Decoding of RS Codes", *IEEE Communications Letters*, Vol. 8, No. 4, pp. 244-246, April 2004

37. J. Li, Y. Cai, K.R. Narayanan, G. Lenner, A. Lucero, A. Pilipetskii and C. N. Georghiades, "On the Bit Error Rate of Product Accumulate Codes in Optical Fiber Communications", *IEEE Journal. of Lightwave Technology*, Vol. 22, No.2, pp. 640-646, Feb. 2004

38. J. Li, K.R. Narayanan, C.N.Georghiades, "Product Accumulate Codes: A Class of Low Complexity Capacity Approaching Codes", *IEEE Tran. Info Theory*, Vol. 50, No. 1, pp. 31-46, Jan 2004

39. K.R. Narayanan, I. Altunbas and R. Narayanaswami, "Design of Codes for Minimum Shift Keying based on Density Evolution", *IEEE Tran. Communications*, pp. 1283-1295, Vol. 51, No. 8, Aug. 2003.

40. A. Mondragon, K.R. Narayanan, and E. Sanchez-Sinencio, "Floating Gate Analog Implementation of the Additive Soft-Input Soft-Output Decoding Algorithm", *IEEE Tran. Circuits and Systems*, pp. 1256-1269, Vol. 50, No. 10, Oct. 2003.

41. V. Gulati and K.R. Narayanan, "Concatenated Codes for Fading Channels Based on Recursive Space-Time Codes", *in IEEE Tran. Wireless Communications*, pp. 118-128, Vol. 2, Jan 2003.

42. S. Choe, C.N. Georghiades and K.R. Narayanan, "Improved Upper Bounds on Error Probability for Biorthogonal Trellis-Coded CDMA Systems", *IEEE Commun. Letters*, pp. 361-363, Vol.6, No.9, Sept. 2002.

43. A. Prabhakar and K.R. Narayanan, "Pseudo-Random Construction of Low Density Parity Check Codes using Linear Congruential Sequences", *IEEE Tran. Communications*, pp. 1389-1396, Vol. 50, No.9, September 2002 .

44. J. Li and K.R. Narayanan, "On the Performance of Single Parity Check based Turbo Product Codes and LDPC codes on Partial Response Channels", *IEEE Tran. Communications*, pp.723-734, vol. 50, no. 5, May, 2002.

45. N. D. Doan and K.R. Narayanan, "Iterative Retransmission Schemes for Inter Symbol Interference Channels", *IEEE Tran. Commun*, pp. 560-571, vol. 50, no. 4, April 2002.

46. B.Lu, X. Wang and K.R. Narayanan, "LDPC based Space-time Coded OFDM Systems over Correlated Fading Channels: Analysis and Receiver Design", *IEEE Tran. Communications*, pp. 74-88, vol. 50, no. 1, Jan. 2002.

47. I. Altunbas and K.R. Narayanan, "A Novel Serial Concatenated Coding Scheme with Minimum Shift Keying", *in IEE Electronics Letters*, pp.1393–1395, vol. 37, no. 23, Nov. 2001

48. U. Dasgupta and K. R. Narayanan, "Parallel Decoding of Turbo Codes using Soft Output $M$ algorithms", *IEEE Comm. Letters*, pp.352–354, vol. 5, no. 8, August 2001.

49. J. Li, E. Kurtas, K.R. Narayanan, and C.N. Georghiades, "On the Performance of Turbo Product Codes for Partial Response Channels", *IEEE Tran. Magnetics*, pp. 1932–1934, vol. 37, no. 4, July 2001

50. K. R. Narayanan, "Effect of Precoding on the Convergence of Turbo Equalization for Partial Response Channels", *IEEE Journal Sel. Areas in Communications*, pp.686-698, vol. 19, no. 4, April 2001.

51. K. R. Narayanan & G. L. Stüber, "Performance of Trellis Coded CPM with Iterative Demodulation and Decoding", *IEEE Trans. Communications*, pp. 676-687, vol. 49, no. 4, April 2001.

52. L. McPheters, S. W. McLaughlin, & K.R. Narayanan, "Precoded PRML, Serial Concatenation, and iterative (turbo) decoding for digital magnetic recording", *IEEE Trans. Magnetics*, pp. 2325–2327, vol. 35, no. 5, Part:I, Sept. 1999

53. K.R.Narayanan & G.L.Stüber, "A Serial Concatenation Approach to Iterative Demodulation and Decoding," *IEEE Trans. Comm.*, pp. 956-961, vol. 47, no. 7, July 1999

54. K.R.Narayanan & G.L.Stüber, "List Decoding of Turbo Codes," *IEEE Trans. Comm.*, pp. 754-762, vol. 46, no. 6, June 1998

55. K.R.Narayanan & G.L.Stüber, "Selective Serial Concatenation of Turbo Codes," *IEEE Comm. Letters*, pp. 136-139, vol. 1, no. 5, Sep. 1997

56. K.R. Narayanan & J.F.Doherty,"A Convex Projections Method for Improved Narrowband Interference Rejection in Direct Sequence Spread Spectrum Systems", *IEEE Trans.Comm*, pp. 772-774, vol. 45, no. 7, July 1997

57. K.R.Narayanan & G.L.Stüber, "A Novel ARQ Technique Based on the Turbo Coding Principle," *IEEE Comm. Letters*, pp. 49-51, vol. 1, no. 2, Feb. 1997

**Invited Talks**

1. "An Iterative Decoding Scheme for Unsourced Multiple Access (Title is tentative)", NSF work on multiple access, MIT, Nov. 2017 (upcoming)
2. "The Peeling Decoder : Theory and Applications", Tutorial presented at the 2017 Australian School on Information Theory, Australian National University, Jan 18, 2017
3. "The Peeling Decoder : Theory and Applications", Tutorial presented at the North American School of Information Theory, Duke University, June 21, 2016
4. "Exploring Connections between Sparse Fourier Transform Computation and Decoding of Product Codes", Simons Institute, Information Theory Program Reunion
5. Key note talk at the 2016 ICC workshop on Massive Uncoordinated Multiple Access
6. "Coding-Inspired Massive Multiple Access for Next-Generation Wireless Networks", Norwegian University of Science and Technology
7. "Coding-Inspired Massive Multiple Access for Next-Generation Wireless Networks", Samsung Research, Dallas, December 2015
8. "Uncoordinated Massive Multiple Access", Chinacom, August 2015
9. "Half Product Codes for Flash Memory", Intel, April 2015
10. "Half Product Codes for Flash Memory", Hitachi, San Jose, March 2015
11. "Uncoordinated Massive Multiple Access", Information Theory at Its Applications Workshop, San Diego, Feb 2015
12. "Lattices from Codes for Harnessing Interference : An Overview and Some Generalizations", IEEE Information Theory Workshop, Tasmania, Australia, Nov. 2014
13. "Coding and Modulation for Physical Layer Network Coding", Signal Processing and Communications Conference, Indian Institute of Science, July 2014
14. "Multilevel Lattice Codes for the Interference Channel", IEEE Communication Theory Workshop, May 2014
15. "Physical Layer Network Coding", ECE Seminar, Iowa State University, April 2014
16. "Lattice Codes based on Product Constructions", Information Theory and its Applications Workshop, Feb 2014
17. "Lattices based on Eisenstein Integers for Compute and Forward", *50th Allerton Conference on Communications, Control and Computing*, 2012
18. "Codes based on Eisenstein Integers for Compute and Forward", Information Theory and Applications Workshop, San Diego, 2012
19. "Coding for Compute and Forward", Banff International Research Station (BIRS) workshop on Algebraic Structure in Network Information Theory, August 2011
20. "Coding for Compute and Forward", Signal Processing and Communications Conference SPCOM 2010, University of Hawaii, November 2010

21. "Coding for Compute and Forward", Signal Processing and Communications Conference SPCOM 2010, Indian Institute of Science, Bangalore, July 2010
22. "Coding for Compute and Forward", Indian Institute of Technology, Madras, July 2010
23. "Joint Physical Layer and Network Layer Coding for Bi-Directional Relaying", Department of Electrical and Computer Engineering, Texas A&M University, Doha, Qatar, May 2010
24. "Joint Physical Layer and Network Layer Coding for Bi-Directional Relaying with Asymmetric Links", Information Theory and its Applications workshop, University of California at San Diego, La Jolla, CA, January 2009
25. "Joint Physical Layer and Network Layer Coding for Bi-Directional Relaying", Department of Electrical and Computer Engineering, University of Massachusetts, Amherst, November 2008
26. "Joint Physical Layer and Network Layer Coding for Bi-Directional Relaying", Department of Electrical and Computer Engineering, University of Arizona, Tucson AZ, February 2008
27. "On the Thermodynamic Temperature of a General Distribution", Fisher Information Workshop, Department of Optics, University of Arizona, Tucson, AZ, February 2008
28. "Joint Source Channel Coding for Non-Ergodic MIMO Channels", WINLAB Seminar, Rutgers University, April 24, 2007
29. "Joint Source Channel Coding for Non-Ergodic MIMO Channels", Columbia University, April 23, 2007
30. "Joint Source Channel Coding for Non-Ergodic MIMO Channels", MIT LIDS Colloquium, April 3, 2007
31. "Hybrid Digital Analog Coding with Side Information", UCSD Workshop on Information Theory and its Applications, February 2007
32. "Bit Level Soft Decision Decoding of Reed Solomon Codes", American Mathematical Society meeting, New Orleans, LA, January 2007
33. "Hybrid Digital Analog Strategies for Broadcasting", Rice University, TX, October 2006
34. "Iterative Signal Processing versus Decision Feedback Signal Processing", ICCSS, March 2006
35. "Hybrid Digital and Analog Space-Time Coding", The University of Texas at Austin, Feb 2006
36. "Further Results on the SNR Exponent of Hybrid Digital Analog Space-Time Codes", UCSD Workshop on Information theory, Feb 2006
37. "On the SNR Exponent of Hybrid Digital Analog Space-Time Codes", Indian Institute of Science, Bangalore, India, December 2005
38. "Soft Decision Decoding of RS Codes", Indian Institute of Science, Bangalore, India, June 2005 and again in December 2005 with updated results.
39. "To Iterate or Feedback? How to Achieve Universally Good Performance on Channels with Memory", Indian Insitute of Science, Bangalore, India, June 2005.

40. "To Iterate or Feedback? How to Achieve Universally Good Performance on Channels with Memory", Indian Institute of Technology, Madras, India, June 2005.
41. "To Iterate or Feedback? How to Achieve Universally Good Performance on Channels with Memory", Georgia Insitute of Technology, Lorraine, Metz, France, April 2005
42. "Soft Decision Decoding of RS Codes", Ecole Nationale Superieur des Telecommunications (ENST) - Paris, France, April 2005
43. "To Iterate or Feedback? How to Achieve Universally Good Performance on Channels with Memory", Ecole Nationale Superieur des Telecommunications (ENST - Paris), Paris, France, April 2005.
44. "Soft Decision Decoding of RS Codes", Ecole Nationale Superieur des Telecommunications (ENST) - Bretagne, France, March 2005
45. "To Iterate or Feedback? How to Achieve Universally Good Performance on Channels with Memory", Institut Eurecom, Sophia Antipolis, France, Jan 2005.
46. "Soft Decision Decoding of RS Codes", University of Notre Dame, IN, November 2005
47. "To Iterate or Feedback? How to Achieve Universally Good Performance on Channels with Memory", The University of Texas at Austin, October 2004
48. "Decision Feedback Signal Processing for Achieving Near Capacity Performance on Channels with Memory", The University of Illinois at Urbana-Champaign, October 2004
49. "Iterative Decoding of RS Codes Based on Adaptive Parity Check Matrices", March 2004, Worskhop on Theoretical Advances in Information Recording, DIMACS, Rutgers University
50. "Simplified Design and Analysis of LDPC Codes for ISI Channels with Turbo Equalization", April 2003, Harvard University.
51. "Design of LDPC codes with MMSE Turbo Equalization", Information Theory Workshop, October 2002
52. "Product Accumulate Codes on Fading Channels", Asilomar Conference on Signals and Systems, November 2002
53. "Design and Analysis of Codes for Turbo Equalization with Optimal and Suboptimal Soft Output Decoding", Allerton conference on communications and control, October 2002 (upcoming)
54. "Product Accumulate Codes: Construction and Properties", Information Theory Workshop, September 2001
55. "Effect of Precoding on the Convergence of Turbo Equalization for Partial Response Channels", The Magnetic Recording Conference, Santa Clara, August 2000
56. "Design considerations for iterative equalization and decoding", Conference on Information Science and Systems (CISS), Princeton, Mar 2000
57. "Iterative demodulation, equalization and decoding", IEEE signal processing society, Dallas TX, January 20, 2000

58. "Performance of Turbo Coded CPM with Iterative Demodulation", IEEE Military Commun. Conf, 1999
59. "Turbo coding and Low density parity check codes for microwave communications", Tadiran Microwave Networks, Houston, TX, December 2, 1999

**Consulting Experience**

- Warren Lex LLP, San Francisco, CA
- GLS Labs, Atlanta, GA
- Microwave Networks, Stafford, TX, 2004
- Wilmer Hale Associates LLP, Boston, MA
- SiRF Technologies, San Jose, CA
- sw4a Inc
- Xilinx Inc

**Professional Activities**

- Board of Governors, IEEE Information Theory Society, 2016-2017
- Technical Program Co-chair, 2018 IEEE Information Theory Workshop
- Technical Program Co-chair, 2010 IEEE International Symposium on Information Theory
- Lead guest editor, IEEE Journal of Selected Areas on Communications special issue on "Equalization with Applications to Wireless Communications", February 2008
- General Co-Chair, IEEE Information Theory Workshop 2007 in Lake Tahoe, CA, September 2007
- Ph.D. thesis reviewer for the Indian Institute of Science, Australia National University, Tel Aviv University, University of Toronto, University of Oulu, Norwegian University of Science and Technology
- Proposal reviewer and/or panelist for the National Science Foundation, Israel Ministry of Science, MICRO proposals for state of California, State of S. Carolina, Hongkong ministry of science, SABIC proposals for King Fahd University of Petroleum and Mines, Saudi Arabia, NSERC in Canada
- Member of best student paper award committee, IEEE signal processing society, data storage sub committee, Member of best paper award committee IEEE Comsoc.

**Conference Publications (Partial List)**

1. V. Amalladinne, A. Vem, D. Soma, K.R. Narayanan and J.-F. Chamberland, "A Coupled Compressive Sensing Scheme for Unsourced Multiple Access", *to appear in Proc. of Intl. Conf. Acoustics, Speech and Signal Processing*, April 2018
2. P.-C. Wang, Y.-C. Huang, K.R. Narayanan and J.J. Boutros, "Physical-Layer Network Coding over Block Fading Channels with Root-LDA Lattice Codes",*in proceedings of ICC 2016.*
3. S. Kumar, A. Vem, K.R. Narayanan and H.D. Pfister, "Spatially-Coupled Codes for Write-Once Memories", *in proceedings of the Allerton Conference on Communications Control and Computing*, 2015

4. N. T. Janakiraman, S. Emmadi, K. R. Narayanan and K. Ramchandran, "Exploring Connections between Sparse Fourier Transform Computation and Product Codes", *in proceedings of the Allerton Conference on Communications Control and Computing*, 2015
5. Y.-C. Huang, K.R. Narayanan, P.-C. Wang "Adaptive Compute-and-Forward with Lattice Codes over Algebraic Integers", *in proceedings of the Intl. Symp. Info. Theory*, 2015
6. S. Madala and K.R. Narayanan, "Uncoordinated Rate Selection: Approaching the Capacity of Gaussian MAC without Coordination", *in proceedings of IEEE ICC, Workshop on Massive Multiple Access*, pp. 2057-2062, June 2015
7. S. Emmadi, K. R. Narayanan and H.D. Pfister, "Half Product Codes for Flash Memory", *in Proceedings of the Non-Volatile Memories Workshop*, Feb 2015
8. Y. Wang and K.R. Narayanan, "Concatenations of Polar Codes with Outer BCH Codes and Convolutional Codes", *in proceedings of the Allerton Conference on Communications Control and Computing*, 2014
9. A. Vem, Y.-C. Huang, K.R. Narayanan and H.D. Pfister, "Multilevel Lattices based on Spatially-Coupled LDPC Codes with Applications", *in proceedings of the IEEE International Symposium on Information Theory*, pp. 2336-2340, July 2014
10. S. Kumar, A. Vem, K.R. Narayanan and H.D. Pfister, "Spatially-Coupled Codes for Side-Information Problems", *in proceedings of the IEEE International Symposium on Information Theory*, pp. 516-520, July 2014
11. Y. Jian, H.D. Pfister, K.R. Narayanan, R. Rao and R. Mazareh, "Iterative Hard Decision of Braided BCH Codes for High Speed Optical Communication", *in proceedings of IEEE Globecom*, 2013
12. B. Hern and K.R. Narayanan, "An Analysis of Joint Compute-and-Forward Decoder for the Binary Input Two-Way Relay Channel", *in proceedings of the Allerton Conference on Communications Control and Computing*, October 2013
13. Y.-C. Huang and K.R. Narayanan, "Lattice Codes Based on Product Constructions over $F_q^2$ with Applications to Compute-and-Forward", *in proceedings of the IEEE Information Theory Workshop*, Sept. 2013
14. E. Tunali, K.R. Narayanan and H.D. Pfister, "Spatially-Coupled Low Density Lattices Based on Construction A with Applications to Compute-and-Forward", *in proceedings of the IEEE Information Theory Workshop*, Sept. 2013
15. B. Hern and K. R. Narayanan, "Joint Compute and Forward for the Two way Relay Channel with Spatially Coupled LDPC codes", *in Proc. of IEEE Globecom*, Nov. 2012, available for download from http://arxiv.org/abs/1205.5904
16. P. S. Nguyen, A. Yedla, H. D. Pfister, and K. R. Narayanan, "On the Maximum *a posteriori* Decoding Thresholds of Multiuser Systems with Erasures", *in Proc. IEEE International Symposium on Information Theory*, pp. 2701-2705, July 2012
17. K. R. Narayanan and H. D. Pfister, "Iterative Collision Resolution for Slotted ALOHA: An Optimal Uncoordinated Transmission Policy", *in Proc. International Symposium on Turbo Codes*, August 2012.

18. P. S. Nguyen, A. Yedla, H. D. Pfister, and K. R. Narayanan, "Threshold Saturation of Spatially-Coupled Codes on Intersymbol-Interference Channels", *in Proc. of IEEE ICC 2012*
19. N. E. Tunali and K. Narayanan, "Concatenated Signal Codes with Applications to Compute and Forward", *in Proc. IEEE Globecom Houston, TX, Dec. 2011*
20. Y.-C. Huang, N. E. Tunali, and K. Narayanan, "On the exchange rate for bi-directional relaying over inter-symbol interference channels", *in Proc. IEEE Globecom, Houston, TX, Dec. 2011*
21. Y.-C. Huang, K. Narayanan, and T. Liu, "Coding for parallel Gaussian bi-directional relay channels: A deterministic approach", *in Proc. Allerton Conference on Communications, Control and Computing, Sept. 2011*
22. A. Yedla, P. S. Nguyen, H. D. Pfister, and K. R. Narayanan, "Universal Codes for the Gaussian MAC via Spatial Coupling", *in Proc. Allerton Conference on Communications, Control and Computing, 2011*
23. B. Hern and K. Narayanan, "Multilevel Coding Schemes for Compute-and-Forward", *in Proc. IEEE Int. Symp. Inform. Theory, St. Petersburg, Russia, July 2011* [http://arxiv.org/abs/1010.1016]
24. A. Yedla, H. Pfister, and K. Narayanan, "Universality for the noisy Slepian-Wolf problem via spatial coupling", *in Proc. IEEE Int. Symp. Inform. Theory, St. Petersburg, Russia, July 2011*
25. A. Yedla, H.D. Pfister and K.R. Narayanan, "LDPC Code Design for Transmission of Correlated Sources across Noisy Channels without CSIT", *in the Proceedings of the Intl. Symp. on Turbo Codes and its Applications*, 2010
26. P.S. Nguyen, H.D. Pfister and K.R. Narayanan, "A Rate-Distortion Exponent Approach to Multiple Decoding Attempts for Reed Solomon Codes", *in the Proceedings of the Intl. Symp. on Info Theory*, 2010
27. M. P. Wilson and K.R. Narayanan, "Transmitting and Analog Gaussian Source over a Gaussian Wiretap Channel under SNR mismatch", *Proceedings of the Intl. Conference on Telecommunications*, ICT 2010
28. P. Parag, J.-F. Chamberland, H. Pfister, and K.R. Narayanan, Code Rate, Queueing Behavior and the Correlated Erasure Channel, *in the proceedings of the Information Theory Workshop*, 2010
29. M. P. Wilson and K.R. Narayanan, "Power Allocation Strategies and Lattice Coding Based Coding Schemes for Bi-Directional Relaying", *Proceedings of IEEE International Symposium on Information Theory*, Seoul, 2009
30. P.S. Nguyen, H.D. Pfister and K.R. Narayanan, "A Rate-Distortion Perspective on Multiple Decoding Attempts for Reed Solomon Codes", *Proceedings of the Allerton Conference on Communications, Control and Computing*, 2009
31. A. Yedla, H.D. Pfister and K.R. Narayanan, "Can Iterative Decoding of Erasure Correlated Source be Universal?" *Proceedings of the Allerton Conference on Communications, Control and Computing*, 2009
32. K.R. Narayanan, M.P. Wilson and A. Sprintson, "Joint Physical Layer and Network Coding for Bi-Directional Relaying", *Proc. Allerton Conference on Communications Control and Computing*, October 2007

33. K.R. Narayanan, G. Caire and M. Wilson, "Duality Between Broadcasting with Bandwidth Expansion and Bandwidth Compression", *Proc. IEEE International Symposium on Information Theory*, 2007
34. M. Wilson, K.R. Narayanan and G. Caire, "Joint Source Channel Coding with Side Information Using Hybrid Digital Analog Codes", *Proc. 2nd ITA Workshop*, Jan 2007
35. J. Jiang and K. R. Narayanan, "Multilevel Coding Schemes for Channels with Non-uniform Inputs and Rateless Transmission over the BSC", *IEEE International Symposium on Information Theory*, 2006.
36. H. Sankar and K. R. Narayanan, "Design of Near-Optimal Coding Schemes for Adaptive Modulation with Practical Constraints", accepted for publication in ICC '06.
37. J. Jiang, C. He, E. Kurtas, and K. R. Narayanan, "Performance of Soft Feedback Equalization over Magnetic Recording Channels" *Intermag*, 2006.
38. K.R. Narayanan and G. Caire, "Further Results on the SNR Exponent of Hybrid Digital Analog Space-Time Codes",*Proc. UCSD Workshop on Info. Theory and Its Applications*
39. N. Nangare, K.R. Narayanan, X. Yang, and E. Kurtas, "Joint Timing Recovery, ISI Equalization and Decoding Using Per-Survivor BCJR-DFE", *in Proc. of IEEE Global Telecommunications Conference*, pp. 1620-1624, Dec 2005
40. B. J. Peiris, K. R. Narayanan and S. L. Miller, " A Frequency Domain Approach to Design Constrained Amplitude Spreading Sequences for DS-CDMA Systems for Frequency Selective Fading Channels, " *Global Telecommunications Conference*, Nov. 2005.
41. G. Caire and K.R. Narayanan, "On the SNR Exponent of Hybrid Digital Analog Space-Time Coding",*Proc. Allerton Conf. on Communications, control and computing*, Oct. 2005
42. J. Jiang and K. R. Narayanan, "Performance Analysis of Algebraic Soft Decoding of Reed-Solomon Codes over Binary Symmetric and Erasure Channels" in *Proc. International Symposium on Information Theory*, pp. 1186-1190, Sept. 2005
43. K. Bhattad, N. Ratnakar, R. Koetter, and K. R. Narayanan, "Minimal Network Coding for Multicast," *Proc. International Symposium on Information Theory 2005*, ISIT 2005, pp. 1730-1734, Adelaide, Australia, Sep. 2005.
44. V. Sethuraman, B. Hajek and K.R. Narayanan, "On the Capacity of Non-Coherent Fading Channels with a Peak Constraint", *in Proc. of IEEE International Symposium on Information Theory*, ISIT, pp. 515-519, Adelaide, Australia, Sep. 2005
45. A. Prabhakar and K. R. Narayanan, "A Scalable Architecture for Linear Congruential LDPC Codes", *IEEE Conf. on Communications, ICC 2005*, pp. 1911-1915, 16-20 May 2005
46. K. Bhattad and K.R. Narayanan, "Weakly Secure Network Coding," *First Workshop on Network Coding, Theory, and Applications*, NETCOD 2005, Riva Del Garda, Italy, April 2005

47. A. Prabhakar, K. Narayanan. A Memory Efficient Serial LDPC Decoder Architecture. *IEEE International Conference on Acoustics, Speech and Signal Processsing,2005*, vol.5, 18-23 March 2005, pages:41-44.

48. H. Sankar, N. Sindhushayana, K. R. Narayanan, "Design of LDPC Codes for high-order constellations," *IEEE Globecomm*, vol.5, pp. 3113-3117, Nov. 29 - Dec. 3, 2004, Dallas, USA.

49. K. Bhattad and K. R. Narayanan, "An MSE Based Transfer Chart to Analyze Iterative Decoding Schemes," *42nd Allerton Conference on Communications, Control, and Computing*, Monticello, IL, Oct. 2004.

50. K.R. Narayanan and N. Nangare, "A BCJR-DFE Algorithm for Achieving Near Capacity Performance on Channels with Memory", *in Proc. of 42nd Allerton Conference on Communications, Control and Computing*, Monticello, IL, Oct. 2004

51. H. Sankar and K. R. Narayanan, "Design of IRA Codes for OFDM with partial CSI", WCNG Conf., University of Texas at Austin, Oct. 23, 2004.

52. J. Jiang and K. R. Narayanan, "Iterative Soft Decision Decoding of Reed-Solomon Codes Based Adaptive Parity Check Matrices" in *Proc. ISIT*, pp. 258, Sept. 2004

53. J. Jiang and K. R. Narayanan, "An Iterative Decoding for Soft Decision Decoding of RS Codes and Its Applications" in *Proc. of DIMACS workshop on theoretical advances in information recording*, Mar. 2004

54. B. J. Peiris, K. R. Narayanan and S. L. Miller, " A Technique to design spreading sequences for the uplink of a DS-CDMA system in Frequency selective fading channels," *Global Telecommunications Conference*, vol. 4, pp. 1867– 1871, Dec. 2003.

55. K.R. Narayanan, X. Wang and G. Yue, "Design of LDPC Codes for Turbo Equalization", *Proc. IEEE Info. Theory Workshop*, Oct. 2002, Bangalore, India.

56. K.R. Narayanan, R.V. Tamma and N.D. Doan, "Design and Analysis of LDPC Codes for Turbo Equalization with Optimal and Sub-Optimal Equalizers", *Proc. Allerton Conf. Commun, Control and Computing*, Oct. 2002

57. V. Gulati and K.R. Narayanan, "Concatenated Codes for Quasi Static Fading Channels: Constrained Capacity and Code Design", *to appear in Proc. of Comm. Theory Mini Conf.*, GLOBECOM 2002.

58. C. F. Lan, K.R. Narayanan and Z. Xiong, "Scalable Image Transmission Using Rate Compatible Irregular Repeat Accumulate Codes",*to appear in Intl. Conf. Image Processing*,2002.

59. K.R. Narayanan, and X. Wang, "LDPC Code Design for MMSE Turbo Equalization", *to appear in IEEE Intl. Symp. on Info. Theory*, June 2002.

60. D.N. Doan and K.R. Narayanan, "Some New Results on the Design of Codes with Turbo Equalization", *in Proc. IEEE Intl. Conf. Commun*, pp. 1873–1877, 2002.

61. K.R. Narayanan, I. Altunbas and R. Narayanaswami, "On the Design of LDPC codes for Minimum Shift Keying", *in Proc. of Comm Theory Mini Conf, GLOBECOM 2001.*

62. J. Li, K.R. Narayanan, and C. N. Georghiades, "Generalized Product Accumulate Codes", *in Proc. of Comm Theory Mini Conf, GLOBECOM 2001.*

63. J.Li, K.R. Narayanan, C.N. Georghiades, and E. Kurtas, "Performance of Product Accumulate Codes for Lorentzian Partial Response Channels", *in Proc. of Comm Theory Mini Conf, GLOBECOM 2001.*

64. B.Lu, X. Wang and K.R. Narayanan, "LDPC based Space-time Coded OFDM Systems over Correlated Fading Channels: Analysis and Receiver Design", *in Proc. Intl. Symp. Info Theory.*

65. J. Li, K.R. Narayanan, and C.N. Georghiades, "Product Accumulate Codes: A Class of Capacity Approaching Codes with Low Decoding Complexity", *Intl. Symp. on Info Theory*, June 2001.

66. J. Li, E. Kurtas, K.R. Narayanan, and C.N. Georghiades, "On the Performance of Turbo Product Codes on Partial Response Channels", *in Proc. of INTERMAG 2001.*

67. K. R. Narayanan, "The Effect of Precoding on the Convergence of Turbo Equalization for Partial Response Channels", *Proc. of Globecom*, Dec. 2000.

68. U. Dasgupta and K. R. Narayanan, "Parallel Decoding of Turbo Codes using Soft Output $M$ algorithms", *in IEEE Vehicular Tech. Conf. 2000.*

69. K.R. Narayanan and J. Li, "Bandwidth Efficient Low Density Parity Check Codes Using Multilevel Coding and Iterative Multi-stage Decoding", *in Proc. Intl. Symposium on Turbo Codes and Applications*, Brest, France, September 2000.

70. K. R. Narayanan, U. Dasgupta and B. Lu, "Low Complexity Iterative Decoding with Binary Precoding",*to appear in Intl. Conf. Commun.*, New Orleans, June 2000.

71. H. Kim, G. L. Stuber, & K. R. Narayanan, "Turbo-Coded ARQ and Its Application to Wideband CDMA System", *to appear Intl. Conf. Telecomm.,*, Mexico, May 2000.

72. K. R. Narayanan, "Design Considerations for Coded Systems with Turbo Equalization", *Proc. Conf. Info Sciences and Systems*, March 2000.

73. K. R. Narayanan, "Iterative Demodulation and Decoding of Trellis coded CPM", *Proc. IEEE Military Commun. Conf,* 1999.

74. K. R. Narayanan, "Turbo Decoding of Space-Time Codes", *Proc. of 37th Allerton conf. on comm., control and computing,* Sept. 1999.

75. K. R. Narayanan & G. L. Stüber, "Performance of Trellis Coded CPM with Iterative Demodulation and Decoding", *Proc. Comm. Theory Mini Conf., GLOBECOM'*1999.

76. K.R.Narayanan & G.L.Stüber, "A Serial Concatenation Approach to Iterative Demodulation and Decoding," *Proc. Comm. Theory Mini Conf., GLOBECOM'*1998.

77. K.R.Narayanan & G.L.Stüber, "List Decoding of Turbo Codes," *Proc. Intl. Conf. Comm.*, pp. 141-145, Atlanta, June 1998.

78. K.R.Narayanan & G.L.Stüber, "List Decoding of Turbo Codes," *Proc. Intl. Conf. Comm.*, pp. 141-145, Atlanta, June 1998.

79. K.R.Narayanan & G.L.Stüber, "Turbo Decoding for Packet Data Systems," *Proc. Comm. Theory Mini Conf., GLOBECOM*, pp. 46-50, Phoenix, Nov. 1997.

80. K.R.Narayanan, G.L.Stüber and M.D.Austin, "Physical Layer Design for Packet Data over IS-136 TDMA", *Proc. Vehicular. Tech. Conf.*, pp. 1029-1033, Phoenix, May 1997.

81. K.R. Narayanan & L.J. Cimini, "Equalizer Adaptation Algorithms for High Speed Wireless Communications", *Proc. Vehicular Tech.Conf.*, pp. 681-685, Atlanta, Apr. 1996.