

RICHARD DALE WESEL

ELECTRICAL AND COMPUTER ENGINEERING DEPARTMENT
AND
OFFICE OF ACADEMIC AND STUDENT AFFAIRS

HENRY SAMUELI SCHOOL OF ENGINEERING
UNIVERSITY OF CALIFORNIA, LOS ANGELES

Room 6426 Boelter Hall • Box 951594 • Los Angeles, CA 90095-1594
Phone (310) 267-2150 • Cell (310) 922-7831 • Email: wesel@ucla.edu

EDUCATION

1991 – 1996, **Stanford University**, Stanford, CA

Ph.D. in Electrical Engineering

Trellis Code Design for Correlated Fading and Achievable Rates for Tomlinson-Harashima Precoding.

1984 – 1989, **Massachusetts Institute of Technology**, Cambridge, MA

S. M. and S. B. in Electrical Engineering

Thesis: *Adaptive Equalization for Modem Constellation Identification.*

EMPLOYMENT

1996 – present, **University of California, Los Angeles**, Los Angeles, CA

- **Associate Dean** of Academic and Student Affairs for the Henry Samueli School of Engineering and Applied Science since July 2007
- **Acting Director** HSSEAS MS Online Program, July 2007 – July 2008 (inaugural year of operation admitting students and offering classes)
- **Professor** of Electrical and Computer Engineering since July 2006
- **Associate Professor** of Electrical Engineering 2002-2006
- **Assistant Professor** of Electrical Engineering 1996-2001

1991 – 1996, **Stanford University**, Stanford, CA, Research Assistant and Teaching Assistant.

1986 – 1994, **AT&T Bell Laboratories**, Holmdel, NJ

- Member of Technical Staff summer 1994
- Member of Technical Staff 1989-1991
- Intern 1986-1989, two summer internships and a culminating 6-month internship.

AWARDS

- Fellow of the Institute of Electrical and Electronics Engineers (IEEE)
- Qualcomm Faculty Award
- Selected for the National Academy of Engineering Frontiers of Engineering Program
- TRW Excellence in Teaching Award (UCLA School of Engineering)
- Okawa Foundation Award for Excellence in Telecommunications Research
- National Science Foundation CAREER Award
- AT&T Foundation Ph.D. Fellow.
- Tau Beta Pi MIT chapter president 1987-1988, Eta Kappa Nu, Sigma Xi, National Merit Scholar.

ACADEMIC SERVICE

- **Associate Dean, Leading Office of Academic and Student Affairs**, including admissions and counseling for all engineering majors, July 2007 to present
- **Chair, Samueli COVID-19 Task Force** 2020-2021
- **Member, UCLA COVID-19 Academic Continuity Task Force** 2020-2021
- **Member, HSSEAS SEASnet review committee**, November 2018 to 2020
- **Chair, Summer Sessions Faculty Advisory Committee**, Sept. 2018 to present.
- **Member, Advisory Committee on Immigration Policy**, 2017 to 2021
- **HSSEAS Strategic Planning Committee for Education**, Jan. 2017-June 2018
- **Member, Center for the Integration of Research, Teaching, and Learning at UCLA, Steering Committee**, January 2017-present
- **Member, Classroom Advisory Committee**, November 2016 to present
- **Chair, UCLA Special Programs Task Force**, Feb. 2013- Sept. 2014
- **Member, UCLA Enrollment Planning Committee** October 2011-present
- **Member, UCLA Undergraduate Non-Resident Implementation Task Force** August 2010 – July 2011
- **Member of UCLA Undergraduate Council** July 2006- July 2008.
- **Member of the Committee on Undergraduate Admissions and Relations with Schools** July 2006- July 2008
- **Electrical Engineering Department Vice Chair for Undergraduate Affairs** July 2005 – July 2007. Successfully managed the 2006 ABET Accreditation visit for EE.
- **Member of the School of Engineering Faculty Executive Committee** 2003-2006.

- **Chair of the Electrical Engineering Department Courses and Curriculum Committee** 2003-2005.
- **Chair of the Communications Major Field** in the Electrical Engineering Department at the University of California, Los Angeles, 1999-2004.
- **Chair of the Cubicle Allocation Committee** for the Electrical Engineering Department at UCLA, managing the allocation of 150 student cubicles among approximately 20 professors who share this space, 1998-2005.
- **Chair of 2002 Annual Research Review** (annual departmental research symposium). Also Vice Chair of 2001 Annual Research Review.
- **Member of 2001 UCLA EE Annual Report Committee.**
- **Elected Member of the Legislative Assembly** of the UCLA Academic Senate, 1997-2001.
- **Chair for quarterly Seminar Series** in Signals and Systems. Established this seminar series in spring 1997. Recruit a professor each quarter to organize speakers for the series. Personally organized speakers for four of these quarters.
- **Local Exhibits Chair**, 1997 UCLA EE Research Symposium

GRADUATED PH.D. STUDENTS

1. Christina Fragouli, Ph.D. Sept. 2000, Dissertation: *Turbo Code Design for High Spectral Efficiency*, 2000-2001 UCLA EE Dept. Best Ph.D. Student 2001. **Professor at UCLA.**
2. Christos Kominakis, Ph.D. Dec. 2000, Dissertation: *Joint Channel Estimation and Decoding for Wireless Channels*, Senior Director of Technology, Qualcomm.
3. Xueting Liu, Ph.D. Dec. 2000, Dissertation: *Trellis Code Design for Periodic Erasures and Adaptive Coded, Modulation Schemes for Time-Varying Channels*, Apple Inc., CA
4. Wei Shi, Ph.D. Dec. 2000, Dissertation: *New Results in Wireless Communications*, Qualcomm
5. Tom Sun, Ph.D. Dec. 2002, Dissertation: *Error Protection Techniques for Source and Channel Coding*, Qualcomm, San Diego, CA
6. Chris Jones, Ph.D. Dec. 2003, Dissertation: *Constructions, applications, and implementations of low-density parity-check codes*, Co-founder Chilicon Power, Los Angeles, CA
7. Adina Matache, Ph. D. June 2004, Dissertation: *Coding Techniques for High Data Rates in Wireless Multiple-Input Multiple-Output Communications*, Aerospace Corp.
8. Cenk Kose, Ph.D. Dec. 2004, Dissertation: *Universal trellis codes and concatenated trellis-coded modulations for the compound linear vector Gaussian channel*
9. Aditya Ramamoorthy, June 2005, *Generalized ACE Codes and Theoretic Results in Network Coding*, **Associate Professor at Iowa State University**
10. Jun Shi, Ph.D. Sept. 2005, Dissertation: *Universal Channel Codes and Trellis State-Diagram Reduction*, Senior Principle Scientist at the Broadcom Corporation
11. Wen-Yen Weng, Ph.D. March 2007, Dissertation: *Universal Serially Concatenated Trellis Coded Modulations and Rate-Compatible High-Rate LDPC Codes*

12. Esteban Valles (Primary Advisor John Villaseñor), Ph.D. March 2007, Dissertation: *Timing Recovery Using Soft Information Feedback and Efficiency of Array Codes*, Aerospace Corporation.
13. Andres Vila Casado, Ph.D. December 2007, Dissertation: *Improving LDPC Decoders: Informed Dynamic Message-Passing Scheduling and Multiple-Rate Code Design*
14. Herwin Chan (Primary Advisor Ingrid Verbauwhede), Ph.D. December 2007, Dissertation: *Accelerating Applications Through Cross-Layer Co-Design*
15. Miguel Griot, Ph.D. Sept. 2008, Dissertation: *Nonlinear Codes for Multiple Access to Binary Channels and Higher-Order Modulations over the AWGN Channel*, Qualcomm Corporation.
16. Bike Xie, Ph.D. June 2010, Dissertation: *Encoding for Degraded Broadcast Channels and Resource Allocation for content Distribution in Peer-To-Peer Networks*, Senior Staff Engineer-Manager at Marvell Corp
17. Thomas Courtade, Ph.D. June 2012, Dissertation: *Two Problems in Multiterminal Information Theory*, **Assistant Professor at UC Berkeley.**
18. Jiadong Wang, Ph.D. June 2012, Dissertation: *Absorbing Set Analysis of LDPC Codes and Read-Channel Quantization in Flash Memory*, Senior Engineer at Qualcomm.
19. Tsung-Yi Chen, Ph. D. September 2013, Dissertation: *Achieving Low-Latency Communication with Feedback: from Information Theory to Practical System Design*, SpiderCloud Wireless.
20. Adam Williamson, Ph. D June 2014, Dissertation: *Reliability-output Decoding and Low-latency Variable-Length Coding Schemes for Communication with Feedback*, Northrop Grumman Corp.
21. Kasra Vakilinia, Ph. D June 2014, Dissertation: *Coding Schemes to Approach Capacity in Short Blocklength with Feedback and LDPC Coding for Flash Memory*, Huawei Technologies.
22. Haobo Wang, Ph. D Decembner, 2018, Dissertation: *Optimizing Flash-Based Storage Systems*, SK Hynix.
23. Sudarsan V.S. Ranganathan, Ph. D December, 2018, Dissertation: *Advances in Protograph-Based LDPC Codes and a Rate Allocation Problem*, Post Doctoral Scholar and Lecturer at the Massachusetts Institute of Technology.

RESEARCH FUNDING SOURCES 1996 - PRESENT

- Mercury Systems
- Qualcomm
- Zeta Corporation
- Physical Optics Corporation
- SA Photonics
- Micron Semiconductor
- National Science Foundation
- Western Digital Corporation
- INPHI Corporation
- Rockwell Collins
- The Broadcom Foundation

- Boeing
- Texas Instruments
- Conexant
- ST Microelectronics
- Northrop Grumman
- Skyworks
- Xetron Corporation
- Pacific Bell
- Honeywell

COURSES TAUGHT 1996 - PRESENT

- EE131A Probability
- EE132A Communications Systems
- EE231A Information Theory
- EE231E Channel Coding
- EE232A Stochastic Processes

PROFESSIONAL ACTIVITIES

- **Associate Editor**, IEEE Transactions on Information Theory, March 2020-present
- **Presenter** of half-day tutorial on Incremental Redundancy at Globecom 2019, December 2019.
- **Panel member** for National Science Foundation Proposal Review Panels.
- **Invited Speaker** half-day tutorial on Incremental Redundancy at the 2018 European School of Information Theory, Bertinoro, Italy, May 2018
- **Invited Speaker** at IEEE UCSD ITA Workshop, annually 2006-present
- **Reviewer** for various IEEE conferences and journals. Regularly reviewing submissions to Trans. on Information Theory, Trans. on Communications, Journal on Selected Areas of Communications, Communications Letters, Globecom, and International Conference on Communications, 1994-present.
- **Technical Program Committee Member**, numerous times for *Globecom*, *ICC*, and *ISIT*.
- **Organizer and lecturer** for UCLA Extension course on Error Control Coding (2000-2006). Received an award for being among the top 10% of UCLA extension lecturers.
- **Associate Editor**, *IEEE Transactions on Communications* 1999-2005.

- **Technical Program Chair**, *Communication Theory Symposium at Globecom 2002*.
- **Organizer and Session Chair** for Special Session on Concatenated codes and iterative decoding at the *2001 Asilomar Conf. on Signals, Systems, and Computers*.
- **Session Organizer and Chair** for Communication Theory Symposium at the 2001 International Conference on Communications.
- **Organizer and Session Chair** for Special Session on Communication over Time Varying Channels at the *1999 Asilomar Conf. on Signals, Systems, and Computers*.
- **Invited speaker** 1998 and 2000 *IEEE Communication Theory Workshops*.
- **Invited speaker** Office of Naval Research, Naval Research Labs 1998 Turbo Codes Workshop.
- **Invited speaker** 1998 DARPA GloMo workshop on emerging technologies for hand-held wireless devices in military communication.
- **Instructor** for 1997 UCLA Extension course on wireless multimedia communications.
- **Invited speaker** at various universities and companies including Stanford, UC-Berkeley, UC-San Diego, Ohio State University, University of Arizona, Johns Hopkins University, Cornell, Telia Research, Lulea, Sweden, Lucent, Boeing, Xetron, Texas Instruments, Conexant, and Microsoft Research.

JOURNAL PUBLICATIONS (see all publications at <http://www.seas.ucla.edu/csl>)

1. H. Yang, E. Liang, M. Pan and R. D. Wesel, "CRC-Aided List Decoding of Convolutional Codes in the Short Blocklength Regime," in *IEEE Transactions on Information Theory*, DOI: 10.1109/TVT.2022.3150717.
2. L. Wang, C. Terrill, M. Stark, Z. Li, S. Chen, C. Hulse, C. Kuo, R. Wesel, G. Bauch, R. Pitchumani, "Reconstruction-Computation-Quantization (RCQ): A Paradigm for Low Bit Width LDPC Decoding," *IEEE Transactions on Communications*, 2022 Early Access Article, DOI: 10.1109/TCOMM.2022.3149913.
3. N. Farsad, W. Chuang, A. Goldsmith, C. Komninakis, M. Médard, C. Rose, L. Vandenberghe, E. E. Wesel, R. D. Wesel, "Capacities and Optimal Input Distributions for Particle-Intensity Channels," *IEEE Transactions on Molecular, Biological and Multi-Scale Communications*. December 2020, vol. 6, no. 3, pp. 220-232, DOI: [10.1109/TMBMC.2020.3035371](https://doi.org/10.1109/TMBMC.2020.3035371).
4. T. Wiegart, F. D. Ros, M. P. Yankov, F. R. Steiner, S. Gaiarin, R. D. Wesel, "Probabilistically Shaped 4-PAM for Short-Reach IM/DD Links with a Peak Power Constraint", *Journal of Lightwave Technology*, October 2020 (Early Access) . DOI: [10.1109/JLT.2020.3029371](https://doi.org/10.1109/JLT.2020.3029371).
5. M. Stark, L. Wang, G. Bauch, R. D. Wesel, "Decoding Rate-Compatible 5G-LDPC Codes with Coarse Quantization Using the Information Bottleneck Method", *IEEE Open Journal of the Communications Society*, May 2020, vol. 1, pp. 646-660, DOI: [10.1109/OJCOMS.2020.2994048](https://doi.org/10.1109/OJCOMS.2020.2994048).

6. H. Wang, S. V. S. Ranganathan, R. D. Wesel, "Variable-Length Coding with Shared Incremental Redundancy: Design Methods and Examples," *IEEE Transactions on Communications*, June 2019, vol. 67, no. 9, pp. 5981-5995. DOI: [10.1109/TCOMM.2019.2919626](https://doi.org/10.1109/TCOMM.2019.2919626).
7. S. V. S. Ranganathan, D. Divsalar, R. D. Wesel, "Quasi-Cyclic Protograph-Based Raptor-Like LDPC Codes for Short Block-Lengths", *IEEE Transactions on Information Theory*, June 2019, vol. 65, no. 6, pp. 3758-3777, DOI: [10.1109/TIT.2019.2895322](https://doi.org/10.1109/TIT.2019.2895322).
8. A. Heidarzadeh, J. Chamberland, R. D. Wesel, and P. Parag, "A Systematic Approach to Incremental Redundancy with Application to Erasure Channels", *IEEE Transactions on Communications*, April 2019, vol. 67, no. 4, pp. 2620-2631, DOI: [10.1109/TCOMM.2018.2889254](https://doi.org/10.1109/TCOMM.2018.2889254).
9. S. V. S. Ranganathan, "Allocating Redundancy Between Erasure Coding and Channel Coding when Fading Channel Diversity Grows with Codeword Length," *IEEE Transactions on Communications*, May 2017, vol. 65, no. 8, pp. 3226 - 3237. DOI: [10.1109/TCOMM.2017.2706728](https://doi.org/10.1109/TCOMM.2017.2706728).
10. H. Wang, N. Wong, T.-Y. Chen, R. D. Wesel, "Using Dynamic Allocation of Write Voltage to Extend Flash Memory Lifetime", *IEEE Transactions on Communications*, November 2016, vol. 64, no. 11, pp. 4474-4486, DOI: [10.1109/TCOMM.2016.2607707](https://doi.org/10.1109/TCOMM.2016.2607707).
11. K. Vakiliinia, S. V. S. Ranganathan, D. Divsalar, and R. D. Wesel, "Optimizing Transmission Lengths for Limited Feedback with Non-Binary LDPC Examples" *IEEE Transactions on Communications*, June 2016, vol. 64, no. 6, pp. 2245-2257, DOI: [10.1109/TCOMM.2016.2538770](https://doi.org/10.1109/TCOMM.2016.2538770).
12. C.-Y. Lou, B. Daneshrad, and R. D. Wesel, "Convolutional-Code-Specific CRC Code Design", *IEEE Transactions on Communications*, October 2015, vol. 63, no. 10, pp. 3459 – 3469, DOI: [10.1109/TCOMM.2015.2459058](https://doi.org/10.1109/TCOMM.2015.2459058).
13. A. R. Williamson, T.-Y. Chen and R. D. Wesel, "Variable-length Convolutional Coding for Short Blocklengths with Decision Feedback", *IEEE Transactions on Communications*, July 2015, vol. 63, no. 7, pp. 2389 – 2403, DOI: [10.1109/TCOMM.2015.2429583](https://doi.org/10.1109/TCOMM.2015.2429583).
14. T.-Y. Chen, K. Vakiliinia, D. Divsalar, and R. D. Wesel, "Protograph-Based Raptor-Like LDPC Codes", *IEEE Transactions on Communications*, Vol. 63, No. 5, pp 1522-1530, May 2015, DOI: [10.1109/TCOMM.2015.2404842](https://doi.org/10.1109/TCOMM.2015.2404842).
15. A. R. Williamson, M. Marshall, and R. D. Wesel, "Reliability-output Decoding of Tail-biting Convolutional Codes," *IEEE Transactions on Communications*, Vol. 62, No. 6, pp 1768-1778, June 2014, DOI: [10.1109/TCOMM.2014.2319264](https://doi.org/10.1109/TCOMM.2014.2319264).
16. J. Wang, K. Vakiliinia, T.-Y. Chen, T. Courtade, G. Dong, T. Zhang, H. Shankar, and R. D. Wesel, "Enhanced Precision Through Multiple Reads for LDPC Decoding in Flash Memories" *IEEE Journal on Selected Areas in Communications*, Vol. 32, No. 5, pp 880-891, May 2014, DOI: [10.1109/JSAC.2014.140508](https://doi.org/10.1109/JSAC.2014.140508).
17. T.A. Courtade and R. D. Wesel, "Coded Cooperative Data Exchange in Multihop Networks," *IEEE Transactions on Information Theory*, Vol. 60, No. 2, pp. 1136-1158, February 2014, DOI: [10.1109/TIT.2013.2290993](https://doi.org/10.1109/TIT.2013.2290993).
18. J. Wang, L. Dolecek and R. Wesel, "The Cycle Consistency Matrix Approach to LDPC Absorbing Sets in Separable Circulant-Based Codes," *IEEE Transactions on Information Theory*, Vol. 59, No. 4, pp 2293 - 2314, April 2013, DOI: [10.1109/TIT.2012.2235122](https://doi.org/10.1109/TIT.2012.2235122).

19. B. Xie, T. A. Courtade, and R. D. Wesel, "Optimal Encoding Schemes for Several Classes of Discrete Degraded Broadcast Channels," *IEEE Transactions on Information Theory*, Vol. 59, No. 3, pp. 1360-1378, March 2013, **DOI:** [10.1109/TIT.2012.2237095](https://doi.org/10.1109/TIT.2012.2237095).
20. M. Griot, A. I. Vila Casado, W.-Y. Weng, H. Chan and R. D. Wesel, "Nonlinear Trellis Codes for Binary-Input Binary-Output Multiple Access Channels With Single-User Decoding," *IEEE Transactions on Communications*, Vol. 60, No. 2, Feb. 2012, **DOI:** [10.1109/TCOMM.2012.010512.070116](https://doi.org/10.1109/TCOMM.2012.010512.070116).
21. T. A. Courtade and R. D. Wesel, "Optimal Allocation of Redundancy Between Packet-Level Erasure Coding and Physical-Layer Channel Coding in Fading Channels," *IEEE Transactions on Communications*, Vol. 59, No. 8, pp. 2101-2109, August 2011, **DOI:** [10.1109/TCOMM.2011.062311.090277](https://doi.org/10.1109/TCOMM.2011.062311.090277).
22. A. I. Vila Casado, M. Griot, and R. D. Wesel, "LDPC Decoders with Informed Dynamic Scheduling," *IEEE Transactions on Communications*, Vol. 58, No. 12, pp 3470-3479, December 2010, **DOI:** [10.1109/TCOMM.2010.101910.070303](https://doi.org/10.1109/TCOMM.2010.101910.070303).
23. A. I. Vila Casado, W.-Y. Weng, S. Valle, and R. D. Wesel, "Multiple-Rate Low-Density Parity-Check Codes with Constant Blocklength," *IEEE Transactions on Communications*, Vol. 57, No. 1, pp 75-83, January 2009, **DOI:** [10.1109/TCOMM.2009.0901.060256](https://doi.org/10.1109/TCOMM.2009.0901.060256).
24. H. Chan, A. I. Vila Casado, J. Basak, M. Griot, W.-Y. Weng, R. D. Wesel, B. Jalali, E. Yablonovitch, I. Verbauwhede, "Demonstration of Uncoordinated Multiple Access in Optical Communications," *IEEE Transactions on Circuits and Systems-I: Regular Papers*, Vol. 55, No. 10, pp 3259-3269, November 2008, **DOI:** [10.1109/TCSL.2008.925365](https://doi.org/10.1109/TCSL.2008.925365).
25. W.-Y. Weng, C. Kose, B. Xie and R. D. Wesel, "Universal Serially Concatenated Trellis Coded Modulation for Space-Time Channels," *IEEE Transactions on Communications*, Vol. 56, No. 10, pp 1636-1646, October 2008, **DOI:** [10.1109/TCOMM.2008.060530](https://doi.org/10.1109/TCOMM.2008.060530).
26. B. Xie, M. Griot, A. I. Vila Casado, and R. D. Wesel, "Optimal Transmission Strategy and Explicit Capacity Region for Broadcast Z Channels," *IEEE Transactions on Information Theory*, Vol. 53, No. 9, pp 4296-4304, September 2008, **DOI:** [10.1109/TIT.2008.928298](https://doi.org/10.1109/TIT.2008.928298).
27. J. Shi and R. D. Wesel, "A Study on Universal Codes with Finite Block Lengths," *IEEE Transactions on Information Theory*, Vol. 54, No. 9, pp 3066-3074, September 2007, **DOI:** [10.1109/TIT.2007.903156](https://doi.org/10.1109/TIT.2007.903156).
28. M. Griot, W.-Y. Weng and R. D. Wesel, "A Tighter Bhattacharyya Bound for Decoding Error Probability," *IEEE Communications Letters*, Vol.11, No. 4, pp 346-347, April 2007, **DOI:** [10.1109/LCOM.2007.348296](https://doi.org/10.1109/LCOM.2007.348296).
29. C. R. Jones, T. Tian, J. Villasenor and R. D. Wesel, "The Universal Operation of LDPC Codes Over Scalar Fading Channels," *IEEE Transactions on Communications*, Vol. 55, no. 1, pp 122-132, Jan. 2007, **DOI:** [10.1109/TCOMM.2006.885081](https://doi.org/10.1109/TCOMM.2006.885081).
30. Kose C. and Wesel R. D., "Universal Space-Time Codes from Demultiplexed Trellis Codes," *IEEE Trans. on Communications*. Vol.54. No 7. July 2006, **DOI:** [10.1109/TCOMM.2006.877967](https://doi.org/10.1109/TCOMM.2006.877967).
31. F. Peng, W. Ryan. and R. D. Wesel, "Surrogate-Channel Design of Universal LDPC Codes," *IEEE Comm. Letters*, Jun. 2006, vol. 10, no. 6, pp 480-482, **DOI:** [10.1109/LCOMM.2006.1638622](https://doi.org/10.1109/LCOMM.2006.1638622)

32. A. Ramamoorthy, J. Shi and R. D. Wesel, "On the Capacity of Network Coding for Random Networks," *IEEE Transactions on Information Theory*, Aug. 2005, Vol. 51, no. 8, pp 2878-2885, DOI: [10.1109/TIT.2005.851725](https://doi.org/10.1109/TIT.2005.851725).
33. Wesel R. D., "Reduced-State Representations for Trellis Codes Using Constellation Symmetry," *IEEE Transactions on Communications*, Aug. 2004, vol. 52, no. 8 pp 1302-1310, DOI: [10.1109/TCOMM.2004.833023](https://doi.org/10.1109/TCOMM.2004.833023).
34. Tian T., Jones C., Villasenor J. D. and Wesel R. D., "Selective Avoidance of Cycles in Irregular LDPC Code Construction," *IEEE Transactions on Communications*, Aug. 2004, vol. 52(8), pp 1242-1247, DOI: [10.1109/TCOMM.2004.833048](https://doi.org/10.1109/TCOMM.2004.833048).
35. Sun T. W., Wesel R. D., Shane M. R. and Jarett K., "Superposition Turbo-TCM for Multi-Rate Broadcast," *IEEE Transactions on Communications*, Mar. 2004, vol. 52(3), pp 368-371, DOI: [10.1109/TCOMM.2004.823646](https://doi.org/10.1109/TCOMM.2004.823646).
36. Shi J. and Wesel R. D., "Efficient Computation of Trellis Code Generating Functions," *IEEE Transactions on Communications*, Feb. 2004, vol. 52(2), pp 219-227, DOI: [10.1109/TCOMM.2003.822702](https://doi.org/10.1109/TCOMM.2003.822702).
37. Matache A. and Wesel R. D., "Universal Trellis Codes for Diagonally Layered Space-Time Systems," *IEEE Transactions on Signal Processing*, Nov. 2003, vol. 51(11) pp 2773-2783, Special Issue on "MIMO Wireless", DOI: [10.1109/TSP.2003.818159](https://doi.org/10.1109/TSP.2003.818159).
38. Kose C. and Wesel R. D., "Universal Space-Time Trellis Codes," *IEEE Trans. on Info. Theory*, Oct. 2003, vol. 40(10) pp 2717-2727 Special Issue on "Space-Time Transmission, Reception, Coding and Signal Design," DOI: [10.1109/TVT.2003.817459](https://doi.org/10.1109/TVT.2003.817459).
39. Q. Zhang, P. K. Varshney, and R. D. Wesel, "Optimal Bi-level quantization of I.I.D Sensor Observations for Binary Hypothesis Testing," *IEEE Transactions on Information Theory*, July 2002, 48(7) pp. 2105-2110, DOI: [10.1109/TIT.2002.1013153](https://doi.org/10.1109/TIT.2002.1013153).
40. C. Komninakis, C. Fragouli, A. H. Sayed, and R. D. Wesel, "Multi-Input, Multi-output Fading Channel Tracking and Equalization Using Kalman Estimation," *IEEE Transactions on Signal Processing*, May 2002, vol. 50(5), pp. 1065-1076, DOI: [10.1109/78.995063](https://doi.org/10.1109/78.995063).
41. A. Bernard, X. Liu, R. D. Wesel, and A. Alwan, "Multi-rate Transmission of Speech Using Rate-Compatible Trellis Codes and Embedded Source Codes," *IEEE Transactions on Communications*, February 2002, vol. 50(2) pp. 309-320, DOI: [10.1109/26.983326](https://doi.org/10.1109/26.983326).
42. P. Ormeci, D. L. Goeckel, X. Liu, and R. D. Wesel, "Adaptive Bit-Interleaved Coded Modulation for Time-Varying Channels Using Outdated Fading Estimates" *IEEE Transactions on Communications*, Sept. 2001, 49(9), pp. 1572-1581, DOI: [10.1109/26.950344](https://doi.org/10.1109/26.950344).
43. R. D. Wesel, X. Liu, J. M. Cioffi, and C. Komninakis, "Constellation Labeling for Linear Encoders," *IEEE Transactions on Information Theory*, Sept. 2001, 47(6), pp. 2417-2431, DOI: [10.1109/18.945255](https://doi.org/10.1109/18.945255).
44. C. Komninakis and R.D. Wesel, "Joint Iterative Channel Estimation and Decoding in Flat Correlated Rayleigh Fading," *IEEE Journal on Selected Areas in Communications*, Sept. 2001, 19(9), pp. 1706-17, DOI: [10.1109/49.947035](https://doi.org/10.1109/49.947035).
45. C. Fragouli and R. D. Wesel, "Turbo encoder design for symbol interleaved parallel concatenated trellis coded modulation," *IEEE Transactions on Communications*, 49(3), Mar. 2001, pp. 425-435, DOI: [10.1109/26.911450](https://doi.org/10.1109/26.911450).
46. W. Shi, T. W. Sun, and R. D. Wesel, "Quasi-convexity and Optimal Binary Fusion for Distributed Detection with Identical Sensors in Generalized Gaussian Noise," *IEEE Transactions on Information Theory*, Jan. 2001, 47(1), pp. 446-450, DOI: [10.1109/18.904560](https://doi.org/10.1109/18.904560).

47. R. D. Wesel, X. Liu, and W. Shi, "Trellis Codes for Periodic Erasures," *IEEE Transactions on Communications*, June 2000, 48(6), pp. 938-947, DOI: [10.1109/26.848553](https://doi.org/10.1109/26.848553).
48. R. D. Wesel and J. M. Cioffi, "Trellis Codes for Periodic Interleavers," *IEEE Communications Letters*, April 1999, 3(4), pp. 103-105, DOI: [10.1109/4234.757202](https://doi.org/10.1109/4234.757202).
49. R. D. Wesel, and J. Cioffi, "Achievable Rates for Tomlinson-Harashima Precoding," *IEEE Transactions on Information Theory*, Mar. 1998, 44(2), pp. 824-831, DOI: [10.1109/18.661530](https://doi.org/10.1109/18.661530).

CONFERENCE PUBLICATIONS

1. J. Nguyen, L. Wang, C. Hulse, S. Dani, A. Antonini, T. Chauvin, D. Dariush, R. Wesel, "Neural Normalized Min-Sum Message-Passing vs. Viterbi Decoding for the CCSDS Line Product Code", ICC 2022, Seoul, South Korea, May 16–20, 2022.
2. L. Wang, D. Song, F. Areces, and R. D. Wesel. "Achieving Short-Blocklength RCU bound via CRC List Decoding of TCM with Probabilistic Shaping", ICC 2022, Seoul, South Korea, May 16–20, 2022.
3. W. Sui, H. Yang, B. Towell, A. Asmani, R. Wesel, "High-Rate Convolutional Codes with CRC-Aided List Decoding for Short Blocklengths", ICC 2022, Seoul, South Korea, May 16–20, 2022.
4. J. King, A. Kwon, H. Yang, W. Ryan, R. Wesel, "CRC-Aided List Decoding of Convolutional and Polar Codes for Short Messages in 5G", ICC 2022, Seoul, South Korea, May 16-20, 2022.
5. C. Terrill, L. Wang, S. Chen, C. Hulse, C. Kuo, R. Wesel, D. Divsalar, "FPGA Implementations of Layered MinSum LDPC Decoders Using RCQ Message Passing", 2021 IEEE Global Communications Conference (GLOBECOM), Madrid, Spain, Dec. 7-11, 2021.
6. L. Wang, S. Chen, J. Nguyen, D. Dariush, R. Wesel, "Neural-Network-Optimized Degree-Specific Weights for LDPC MinSum Decoding", 2021 International Symposium on Topics in Coding (ISTC), Montréal, Canada, Aug. 30-Sept. 3, 2021.
7. A. Antonini, R. Gimelshein, R. D. Wesel, "Causal (Progressive) Encoding over Binary Symmetric Channels with Noiseless Feedback", 2021 IEEE International Symposium on Information Theory (ISIT), Melbourne, Victoria, Australia, July 12-20, 2021.
8. D. Xiao, L. Wang, D. Song, R. D. Wesel, "Finite-Support Capacity-Approaching Distributions for AWGN Channels," 2020 IEEE Information Theory Workshop, Online, April 11-15 2021.
9. A. Arafa, R. D. Wesel, "Timely Transmission Using Optimized Variable Length Coding," 2021 IEEE INFOCOM Age of Information Workshop, Online, May 10, 2021.
10. L. Wang, M. Stark, R. D. Wesel, G. Bauch, "A Reconstruction-Computation-Quantization (RCQ) Approach to Node Operations in LDPC Decoding," 2020 IEEE Global Communications Conference, Taipei, Taiwan, Dec. 7-11, 2020.
11. J. Nguyen, E. Liang, L. Wang, T. Drullinger, T. Chauvin, R. D. Wesel, "Comparison of Integrated and Independent RF/FSOTransceivers on a Fading Optical Channel," 2020 Asilomar Conference on Signals, Systems, and Computers, Pacific Grove, CA, USA, Nov. 1-5, 2020.

12. Hengjie Yang, Linfang Wang, Vincent Lau, Richard D. Wesel, "An Efficient Algorithm for Designing Optimal CRCs for Tail-Biting Convolutional Codes", 2020 IEEE International Symposium on Information Theory, June 21-26, 2020, Los Angeles, CA.
13. Amael Antonini, Hengjie Yang, Richard D. Wesel, "Low Complexity Algorithms for Transmission of Short Blocks over the BSC with Full Feedback," 2020 IEEE International Symposium on Information Theory, June 21-26, 2020, Los Angeles, CA.
14. Hengjie Yang, Richard D. Wesel, "Finite-Blocklength Performance of Sequential Transmission over BSC with Noiseless Feedback", 2020 IEEE International Symposium on Information Theory, June 21-26, 2020, Los Angeles, CA.
15. Maximilian Stark, Gerhard Bauch, Linfang Wang, Richard D. Wesel, "Information Bottleneck Decoding of Rate-Compatible 5G-LDPC Codes", 2020 IEEE Int. Conf. Commun., Virtual Conference, June 7-11, 2020.
16. H. Yang, E. Liang, H. Yao, A. Vardy, D. Divsalar, and R. D. Wesel, "A List-Decoding Approach to Low-Complexity Soft Maximum-Likelihood Decoding of Cyclic Codes," 2019 IEEE Global Communications Conference, Dec. 9-13, 2019, Waikoloa, HI, USA.
17. E. Liang, H. Yang, H. Yao, D. Divsalar, and R. D. Wesel, "List-Decoded Tail-Biting Convolutional Codes with Distance-Spectrum Optimal CRCs for 5G," 2019 IEEE Global Communications Conference, Dec. 9-13, 2019, Waikoloa, HI, USA.
18. N. Wong, H. Wang, E. Liang, S. V. S. Ranganathan, and R. D. Wesel, "Decoding Flash Memory with Progressive Reads and Independent vs. Joint Encoding of Bits in a Cell," 2019 IEEE Global Communications Conference, Dec. 9-13, 2019, Waikoloa, HI, USA.
19. H. Yang and R. D. Wesel, "On the Most Informative Boolean Functions of the Very Noisy Channel," 2019 IEEE International Symposium on Information Theory, July 7-12, 2019, Paris, France.
20. H. Yang and R. D. Wesel, "Serial List Viterbi Decoding with CRC: Managing Errors, Erasures, and Complexity," 2018 IEEE Global Communications Conference, Dec. 9-13, 2018, Abu Dhabi, UAE.
21. H. Wang and R. D. Wesel, "Channel Code Analysis and Design using Multiple Variable-Length Codes in Parallel without Feedback," 2018 IEEE Global Communications Conference, Dec. 9-13, 2018, Abu Dhabi, UAE.
22. R. D. Wesel, N. Wong, A. Baldauf, A. Belhouchat, A. Heidarzadeh, and J.-F. Chamberland, "Transmission Lengths that Maximize Throughput of Variable-Length Coding & ACK/NACK Feedback," 2018 IEEE Global Communications Conference, Dec. 9-13, 2018, Abu Dhabi, UAE.
23. A. Baldauf, A. Belhouchat, N. Wong, R. D. Wesel, "Efficient Computation of Convolutional Decoder Reliability Without a CRC," Asilomar Conference on Signals, Systems and Computers, Pacific Grove, CA, October 28-31, 2018.
24. S. V. S. Ranganathan, R. D. Wesel and D. Divsalar, "Linear Rate-Compatible Codes with Degree-1 Extending Variable Nodes Under Iterative Decoding," 2018 IEEE International Symposium on Information Theory (ISIT), Vail, CO, USA, 2018, pp. 1166-1170.
25. A. Heidarzadeh, J. Chamberland, P. Parag and R. D. Wesel, "A Systematic Approach to Incremental Redundancy over Erasure Channels," 2018 IEEE International Symposium on Information Theory (ISIT), Vail, CO, USA, 2018, pp. 1176-1180.

26. R. D. Wesel, E. E. Wesel, L. Vandenberghe, C. Komninakis, and M. Medard, "Efficient Binomial Channel Capacity Computation with an Application to Molecular Communication," IEEE 2018 Inf. Theory and Applications (ITA) Workshop. La Jolla, CA. February 11 - February 16, 2018.
27. S. V. S. Ranganathan, D. Divsalar, and R. D. Wesel, "Design of Improved Quasi-Cyclic Protograph-Based Raptor-Like LDPC Codes for Short Block-Lengths," IEEE Int. Symp. Inf. Theory (ISIT). June 2017.
28. H. Wang, S. V. S. Ranganathan, and R. D. Wesel, "Approaching Capacity Using Incremental Redundancy without Feedback," IEEE Int. Symp. Inf. Theory (ISIT).). June 2017.
29. H. Wang, N. Wong, A. M. Baldauf, C. K. Bachelor, S. V. S. Ranganathan, D. Divsalar, and R. D. Wesel, "An Information Density Approach to Analyzing and Optimizing Incremental Redundancy with Feedback," IEEE Int. Symp. Inf. Theory (ISIT).). June 2017.
30. N. Wong, K. Vakili, H. Wang, S. V. S. Ranganathan, and R. D. Wesel, "Sequential Differential Optimization of Incremental Redundancy Transmission Lengths: An Example with Tail-Biting Convolutional Codes," IEEE 2016 Inf. Theory and Applications (ITA) Workshop. La Jolla, CA. February 12 - February 17, 2017.
31. S. V. S. Ranganathan, K. Vakili, D. Divsalar, and R. D. Wesel, "Universal Rate-Compatible LDPC Code Families for Any Increment Ordering". 9th Int. Symp. Turbo Codes & Iterative Information Processing (ISTC), Brest, France, September 5 - September 9, 2016.
32. R. D. Wesel, K. Vakili, S. V. S. Ranganathan, T. Mu, and D. Divsalar, "Resource-Aware Incremental Redundancy in Feedback and Broadcast," In Proceedings of the 2016 International Zurich Seminar on Communications, March 2-4, 2016, pp 63-67.
33. S. V. S. Ranganathan, K. Vakili, L. Dolecek, D. Divsalar, and R. D. Wesel, "Some Results on Spatially Coupled Protograph LDPC Codes". IEEE 2016 Inf. Theory and Applications (ITA) Workshop. La Jolla, CA. February 12 - 17, 2016.
34. H. Wang, N. Wong, and R. D. Wesel, "Dynamic Voltage Allocation with Quantized Voltage Levels and Simplified Channel Modeling," 49th Asilomar Conference on Signals, Systems and Computers, Pacific Grove, CA November 8-11, 2015.
35. S. V. S. Ranganathan, D. Divsalar, and R. D. Wesel, "On the Girth of (3,L) Quasi-Cyclic LDPC Codes Based on Complete Photographs". IEEE Int. Symp. Inf. Theory (ISIT). Wanchai, Hong Kong. June 14 - 19, 2015. DOI: 10.1109/ISIT.2015.7282491
36. K. Vakili, D. Divsalar, and R. D. Wesel, "RCA Analysis of the Polar Codes and the use of Feedback to aid Polarization at Short Blocklengths", IEEE Int Symp. INF. Theory (ISIT), Wanchai, Hong Kong, June 14-19, 2015.
37. H. Wang, T.-Y. Chen, and R. D. Wesel, "Histogram-Based Flash Channel Estimation", IEEE Int. Conf. Commun., London, UK, June 8-12, 2015.
38. C.-Y. Lou, B. Daneshmand, and R. D. Wesel, "Optimizing Pilot Length for a Go/No-Go Decision in Two-State Block Fading Channels with Feedback", IEEE Int. Conf. Commun., London, UK, June 8-12, 2015.
39. K. Vakili, D. Divsalar, and R. D. Wesel, "Protograph-Based Raptor-Like LDPC Codes for the Binary Erasure Channel". IEEE 2015 Inf. Theory and Applications (ITA) Workshop. La Jolla, CA. February 1 - February 6, 2015.
40. K. Vakili, A. R. Williamson, S. V. S. Ranganathan, D. Divsalar, R. D. Wesel, "Feedback Systems using Non-Binary LDPC Codes with a Limited Number of Transmissions". IEEE Information Theory Workshop (ITW). Hobart, Tasmania, Australia. Nov. 2 – Nov. 5, 2014.

41. K. Vakilinia, D. Divsalar, and R. D. Wesel, "Optimized Degree Distributions for Binary and Non-Binary LDPC Codes in Flash Memory". IEEE Int. Symp. Inf. Theory and Applicat. (ISITA), Melbourne, Australia, October 26 – 29, 2014.
42. K. Vakilinia, T.-Y. Chen, S. V. S. Ranganathan, A. R. Williamson, D. Divsalar, and R. D. Wesel, "Short-Blocklength Non-Binary LDPC Codes with Feedback-Dependent Incremental Transmissions". IEEE Int. Symp. Inf. Theory (ISIT), Honolulu, Hawaii, USA, June 29 - July 4, 2014.
43. S. V. S. Ranganathan, D. Divsalar, K. Vakilinia, and R. D. Wesel, "Design of High-Rate Irregular Non-binary LDPC Codes Using Algorithmic Stopping-Set Cancellation". IEEE Int. Symp. Inf. Theory (ISIT), Honolulu, Hawaii, USA, June 29 - July 4, 2014.
44. T.-Y. Chen, A. R. Williamson, and R. D. Wesel, "Asymptotic Expansion and Error Exponent of Two-Phase Variable-Length Coding with Feedback for Discrete Memoryless Channels". IEEE Int. Symp. Inf. Theory (ISIT), Honolulu, Hawaii, USA, June 29 - July 4, 2014.
45. T.-Y. Chen, D. Divsalar, and R. D. Wesel, "Finite-blocklength analysis of rate-compatible codes". IEEE Int. Symp. Inf. Theory (ISIT), Honolulu, Hawaii, USA, June 29 - July 4, 2014.
46. T.-Y. Chen, A. R. Williamson, and R. D. Wesel, "Increasing Flash Memory Lifetime by Dynamic Voltage Allocation for Constant Mutual Information". IEEE Inf. Theory and Applications (ITA) Workshop, San Diego, CA, USA, February 9 - 14, 2014.
47. T.-Y. Chen, A. R. Williamson, and R. D. Wesel, "Variable-length Coding with Feedback: Finite-length Codewords and Periodic Decoding". IEEE Int. Symp. Inf. Theory (ISIT), Istanbul, Turkey, July 7 - 12, 2013.
48. A. R. Williamson, T.-Y. Chen, and R. D. Wesel, "Reliability-based Error Detection for Feedback Communication with Low Latency". IEEE Int. Symp. Inf. Theory (ISIT), Istanbul, Turkey, July 7 - 12, 2013.
49. A. R. Williamson, T.-Y. Chen, and R. D. Wesel, "Firing the Genie: Two-Phase Short-blocklength Convolutional Coding with Feedback". IEEE Inf. Theory and Applications (ITA) Workshop, San Diego, CA, USA, February 12-16, 2013.
50. T.-Y. Chen, D. Divsalar, and R. D. Wesel, "Chernoff Bounds for Analysis of Rate- Compatible Sphere-Packing with Numerous Transmissions". IEEE Inf. Theory Workshop (ITW), Lausanne, Switzerland September 3 - 7, 2012.
51. A. R. Williamson, T.-Y. Chen, and R. D. Wesel, "A Rate-Compatible Sphere-Packing Analysis of Feedback Coding with Limited Retransmissions". IEEE Int. Symp. Inf. Theory (ISIT), Cambridge, MA, USA, July 1-6, 2012.
52. A. Marinoni, P. Savazzi and R. D. Wesel, "On q-ary LDPC Code Design for a Low Error Floor". Globecom 2011, Houston, Texas, USA, December 2011.
53. T.-Y. Chen, D. Divsalar, J. Wang and R. D. Wesel, "Protograph-Based Raptor-Like LDPC Codes for Rate Compatibility with Short Blocklengths". Globecom 2011, Houston, Texas, USA, December 2011.
54. J. Wang, H. Shankar and R. D. Wesel, "Soft Information for LDPC Decoding in Flash: Mutual-Information Optimized Quantization". Globecom 2011, Houston, Texas, USA, December 2011.
55. T. A. Courtade, J. Wang, and R. D. Wesel, "Superposition Coding to Support Multiple Streams, Priorities, and Channel Capacities in the Context of GMSK", to appear in MILCOM, Nov 2011.
56. T. A. Courtade and R. D. Wesel, "Weighted Universal Recovery, Practical Secrecy, and an Efficient Algorithm for Solving Both". Forty-Ninth Annual Allerton Conference on Communication, Control, and Computing, 2011.

57. B. Xie, M. van der Schaar, T. A. Courtade and R. D. Wesel, "Minimizing Weighted Sum Finish Time for One-To-Many File Transfer in Peer-To-Peer Networks". Forty-Ninth Annual Allerton Conference on Communication, Control, and Computing, 2011.
58. T. A. Courtade and R. D. Wesel, "Multiterminal Source Coding with an Entropy-Based Distortion Measure". ISIT 2011, Saint-Petersburg, Russia, August 2011.
59. J. Wang, L. Dolecek, Z. Zhang and R. D. Wesel, "Absorbing Set Spectrum Approach for Practical Code Design". ISIT 2011, Saint-Petersburg, Russia, August 2011.
60. J. Wang, L. Dolecek and R. D. Wesel, "Controlling LDPC Absorbing Sets via the Null Space of the Cycle Consistency Matrix". ICC 2011, Kyoto, Japan, June 2011.
61. T.-Y. Chen, N. Seshadri and R. D. Wesel, "A Sphere-Packing Analysis of Incremental Redundancy with Feedback". ICC 2011, Kyoto, Japan, June 2011.
62. J. Wang, L. Dolecek and R. D. Wesel, "LDPC Absorbing Sets, the Null Space of the Cycle Consistency Matrix, and Tanner's Constructions". ITA 2011, San Diego, CA, USA, Feb. 2011.
63. T.-Y. Chen, N. Seshadri and R. D. Wesel, "Incremental Redundancy: A Comparison of a Sphere-Packing Analysis and Convolutional Codes". ITA 2011, San Diego, CA, USA, Feb. 2011.
64. T. A. Courtade and R. D. Wesel, "Efficient Universal Recovery in Broadcast Networks". Forty-Eighth Annual Allerton Conference on Communication, Control, and Computing: Monticello, IL, Sept. 29-Oct. 1, 2010.
65. E. L. Valles, R. D. Wesel, J. D. Villasenor, C. R. Jones and M. Simon, "Pilotless Carrier Phase-Synchronization via LDPC Code Feedback". MILCOM 2010: San Jose, CA, Oct. 31 - Nov 3, 2011.
66. T. A. Courtade, B. Xie, and R. D. Wesel, "Optimal Exchange of Packets for Universal Recovery in Broadcast Networks". MILCOM 2010: San Jose, CA, Oct. 31 - Nov 3, 2010.
67. A. Marinoni, P. Savazzi and R. D. Wesel, "Protograph-based q-ary LDPC Codes for Higher-Order Modulation". ISTC 2010: Brest, France, Sept 6-10, 2010.
68. T. A. Courtade and R. D. Wesel, "A Deterministic Approach to Rate-Compatible Fountain Communication". ITA 2010: La Jolla, CA, Jan. 31 - Feb. 5, 2010.
69. B. Xie and R. D. Wesel, "Optimal Natural Encoding Scheme for Discrete Multiplicative Degraded Broadcast Channels". ISIT 2009: Seoul, Korea, June 28-July 3, 2009.
70. A. Marinoni, T. A. Courtade and R. D. Wesel, "Spectrally Efficient LDPC Coded Modulations". GTTI 2009: sessione Trasmissione, Parma, Italy, June 23-25, 2009. ***Winner of the Francesco Carassa award for the best paper from a young scientist in the sessione Trasmissione.***
71. T. A. Courtade and R. D. Wesel, "A Cross-Layer Perspective on Rateless Coding for Wireless Channels". ICC 2009, Dresden, Germany, June 14-18, 2009.
72. B. Xie and R. D. Wesel, "Optimal Independent-Encoding Schemes for Input-Symmetric Degraded Broadcast Channels". ITA 2008, San Diego, USA, Jan. 27 - Feb. 1, 2008.
73. B. Xie and R. D. Wesel, "A Mutual Information Invariance Approach to Symmetry in Discrete Memoryless Channels". ITA 2008, San Diego, USA, Jan. 27 - Feb. 1, 2008.
74. Miguel Griot, A. I. Vila Casado, and R. D. Wesel, "Nonlinear Turbo Codes for Higher-Order Modulations". ICC 2008, Beijing, China, May 2008.
75. Y.M. Chang, A. I. Vila Casado, M.F. Chang, and R. D. Wesel, "Lower-Complexity Layered Belief Propagation Decoding of LDPC Codes". ICC 2008, Beijing, China, May 2008.

76. M. Griot, A. I. Vila Casado, and R. D. Wesel, "On the Design of Arbitrarily Low-Rate Turbo-Codes". Globecom 2007, Washington, D.C., November 2007.
77. A. I. Vila Casado, M. Griot and R. D. Wesel, "Improving LDPC Decoders via Informed Dynamic Scheduling". ITW 2007, Lake Tahoe, CA, USA, September 2007, pp 208-213.
78. B. Xie, M. Griot, A. I. Vila Casado and R. D. Wesel, "Optimal Transmission Strategy and Capacity Region for Broadcast Z Channels". ITW 2007, Lake Tahoe, CA, USA, September 2007, pp 390-395.
79. A. I. Vila Casado, M. Griot and R. D. Wesel, "Informed Dynamic Scheduling for Belief-Propagation Decoding of LDPC Codes". ICC 2007, Glasgow, Scotland, July 2007, pp 932-937.
80. H. Chan, M. Griot, A. Vila Casado, R. Wesel, I. Verbauwhede "High Speed Channel Coding Architectures for the Uncoordinated OR Channel". IEEE 17th INTERNATIONAL CONFERENCE ON Application-specific Systems, Architectures and Processors (ASAP), Steamboat Springs, Colorado, September 2006.
81. M.Griot, A. I. Vila Casado and R. D. Wesel "Non-linear Turbo Codes for Interleaver-Division Multiple Access on the OR Channel". Globecom 2006, 27 Nov. - 1 Dec., San Francisco, USA.
82. W.-Y. Weng, B. Xie and R. D. Wesel "Universal Space-Time Serially Concatenated Trellis Coded Modulations". Globecom 2006, 27 Nov. - 1 Dec., San Francisco, USA.
83. A. I. Vila Casado, S. Valle, W.-Y. Weng, and R. D. Wesel "Constant-Blocklength Multiple-Rate LDPC Codes for Analog-Decoding Implementations". Proceedings Analog Decoding Workshop, June 2006.
84. E.Valles, C. Jones, R. Wesel and J. Villasenor "Carrier and Timing Synchronization of BPSK via LDPC Code Feedback". IEEE 40th Asilomar Conference on Signals, Systems and Computers. Pacific Grove,CA. Nov.2006.
85. M. Simon, E. Valles, C. Jones, R. Wesel and J. Villasenor "Information-Reduced Carrier Synchronization of BPSK and QPSK Using Soft Decision Feedback" The IEEE 44th Annual Allerton Conference on Communication, Control and Computing. Urbana,IL Sep. 2006.
86. M. Griot, A. I. Vila Casado, W.-Y. Weng, H. Chan, J. Basak, E. Yablonovitch, I. Verbauwhede, B. Jalali, and R. D. Wesel "Trellis Codes with Low Ones Density for the OR Multiple Access Channel" , IEEE ISIT, Seatte, USA, July 2006.
87. M.Griot, A. I. Vila Casado, W.-Y. Weng, H. Chan, J. Basak, E. Yablonovitch, I.Verbauwhede, B. Jalali, and R. D. Wesel "Interleaver-Division Multiple Access on the OR Channel" Information Theory and Applications workshop. San Diego, 2006.
88. Yang Han, William E. Ryan and Wesel R. D. "Dual-Mode Decoding of Product Codes with Application to Tape Storage" , IEEE GlobeCom 2005. St Louis, MO., vol. 3, 28 Nov.-2 Dec. 2005, pp 1255-1260.
89. Valles E., Vila Casado A. I., Blaum M., Villasenor J and Wesel R. D., "Hamming Codes Are Rate-Efficient ArrayCodes" , IEEE GlobeCom 2005. St Louis, MO., Vol. 3, 28 Nov.-2 Dec. 2005, pp 1320-1324.
90. Kose C. and Wesel R. D., "Universal Space-Time Codes from standard trellis codes" , *GlobeCom 2004*, Dallas, TX, Nov. 29-Dec. 3, 2004, pp 391-395.
91. Shi J. and Wesel R. D., "Channel Eigenvector-Invariant Space-Time Constellations" , *GlobeCom 2004*, 29 Nov.-3 Dec. 2004, pp 530-534
92. Shi J. and Wesel R. D., "Universal Codes with Finite Block Lengths" , *MilCom 2004*, 31 Oct.-3 Nov. 2004, pp 1338-1344

93. Ramamoorthy A. and Wesel R. D., "Analysis of an Algorithm for Irregular LDPC Code Construction," *ISTT 2004*, Chicago, Illinois
94. Shi J. and Wesel R. D., "Rotationally Invariant Space-Time Constellations," *ISTT 2004*, Chicago, Illinois
Shi J. and Wesel R. D., "Channel Eigenvector-Invariant Space-Time Constellations" *GlobeCom 2004*, Dallas, TX, Nov. 29-Dec. 3, 2004, pp 391-395.
95. Vila Casado A. I., Weng W. and Wesel R. D., "Multiple-Rate Low-Density Parity-Check Codes with Constant Block Length" , *Conference Record of Thirty-Eighth Asilomar Conf. on Signals, Systems and Computers*, Pacific Grove, CA, Nov. 7-10, 2004, pp 2010-2014.
96. Matache A., Jones C and Wesel R. D., "Reduced Complexity MIMO Detectors for LDPC Coded Systems" , *MilCom 2004*, 31 Oct.-3 Nov. 2004, pp 1073-1079
97. Ramamoorthy A. and Wesel R. D., "Expansion Properties of Generalized ACE Codes" , *42nd Allerton Conference on Communication, Control and Computing 2004*, Monticello, Illinois
98. Weng W., Ramamoorthy A. and Wesel R. D., "Lowering the Error Floors of High-Rate LDPC Codes by Graph Conditioning," *VTTC 2004*, September 2004, Los Angeles, California, pp 2549-2553.
99. Chan H., Hodjat A., Shi J., Wesel R. D. and Verbaauwhede I., "Streaming Encryption for a Secure Wavelength and Time Domain Hopped Optical Network," *IEEE Intl. Conf. on Information Technology (ICIT) 2004*.
100. Ramamoorthy A. and Wesel R. D., "Construction of Short Block Length Irregular LDPC Codes," , *ICC 2004*, Paris, June 2004.
101. Ramamoorthy A., Shi J., and Wesel R. D., "On the Capacity of Network Coding for Random Networks," *Allerton Conference on Communication, Control and Computing*, October 2003
102. Jones C., Matache A., Tian T., Villasenor J. and Wesel R. D., "The Universality of LDPC Codes on Wireless Channels," *MilCom 2003*, Boston, MA, October 2003
103. J. Shi and R. D. Wesel, "Further Error Event Diagram Reduction Using Algorithmic Techniques," *International Conference on Communications (ICC) 2003*, Ankorage, AK, May 2003.
104. C. Kose, W. Weng, and R. D. Wesel, "Serially Concatenated Trellis Coded Modulation for the Compound Periodic Erasures Channel," *International Conference on Communications (ICC) 2003*, Ankorage, AK, May 2003, pp 2953-2957.
105. T. W. Sun, R. D. Wesel, M. R. Shane, and K. Jarett, "Superposition Turbo TCM for Multi-Rate Broadcast," *International Conference on Communications (ICC) 2003*, Ankorage, AK, May 2003.
106. T. Tian, C. Jones, J. D. Villasenor, and R. D. Wesel, "Construction of Irregular LDPC Codes with Low Error Floors," *International Conference on Communications (ICC) 2003*, Ankorage, AK, May 2003.
107. C. Kose and R. D. Wesel, "Universal Space-Time Trellis Codes," *Globecom 2002*, Taipei, Taiwan, November 2002.
108. C. Jones, T. Tian, A. Matache, R.D. Wesel, and J. Villasenor, "Robustness of LDPC Codes on Periodic Fading Channels," *Globecom 2002*, Taipei, Taiwan, November 2002.
109. M. R. Shane and R. D. Wesel, "Reduced Complexity Iterative Demodulation and Decoding of Serial Concatenated CPM," *International Conference on Communications (ICC) 2002*, New York, NY, April 28-May 2, 2002.
110. A. Matache and R. Wesel, "Trellis Coding for Diagonally Layered Space-Time Systems," *International Conference on Communications (ICC) 2002*, New York, NY, April 28-May 2, 2002.

- 111.C. Kose and R. D. Wesel,, "Performance of Likelihood Ratio Tests under Incorrect Models" *35th Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, CA, Nov. 2001.
- 112.M. R. Shane and R. D. Wesel, "Reduced Complexity Iterative Demodulation and Decoding of Serial Concatenated CPM," *35th Asil. Conf. on Signals, Systems, and Computers*, Pacific Grove, CA, Nov. 2001.
- 113.A. Matache and R. Wesel, "Trellis Coding for Layered Space-Time Systems," *35th Asilomar Conference on Signals, Systems, and Computers*, (invited) Pacific Grove, CA, Nov. 2001.
- 114.C. Komninakis and R. D. Wesel, "Trellis Turbo-codes in Flat Rayleigh Fading with Diversity," *Globecom 2001*, San Antonio, TX, November 25-29, 2001.
- 115.C. Fragouli and R. Wesel, "Bit vs. Symbol Interleaving for Parallel Concatenated Trellis Coded Modulation," *Globecom 2001*, San Antonio, TX, November 25-29, 2001.
- 116.C. Komninakis, R. D. Wesel, and L. Vandenbergh, "Capacity of the Binomial Channel, or Minimax Redundancy for Memoryless Sources," *IEEE International Symposium on Information Theory*, June 24-29, 2001, Washington D. C., page 127.
- 117.C. Fragouli, R. Wesel, Dirk Sommer, and Gerhard Fettweis, "Turbo Codes with Non-Uniform QAM Constellations," *International Conference on Communications (ICC) 2001*, Helsinki, Finland, June 2001, pp.70-73.
- 118.C. Kose and R. D. Wesel, "Code Design Metrics For Space-Time Systems Under Arbitrary Fading," *ICC 2001*, Helsinki, Finland, June 2001, pp. 1099-1103.
- 119.C. Fragouli, C. Komninakis, and R. D. Wesel, "Minimality Under Periodic Puncturing," *ICC 2001*, Helsinki, Finland, June 2001, pp. 300-304.
- 120.X. Liu, P. Ormeci, R. Wesel, and D. Goeckel, "Bandwidth-Efficient, Low-Latency Adaptive Coded Modulation Schemes for Time-Varying Channels," *ICC 2001*, Helsinki, Finland, June 2001, pp. 2211-2215.
- 121.W. Shi, C. Komninakis, R. Wesel, and B. Daneshrad, "Robustness of Space-Time Turbo Codes," *ICC 2001*, Helsinki, Finland, June 2001, pp. 1700-1704.
- 122.T. W. Sun and R. D. Wesel, "Constellation Labeling for Error-Resilient Source Coding of PAM," *35th Annual Conference on Information Sciences and Systems*, March 21-23, 2001, The Johns Hopkins University, Baltimore, Maryland, page 295.
- 123.M. Shane and R. D. Wesel, "Tight Bounds on the Mutual Information of the Binary Input AWGN Channel," *35th Annual Conference on Information Sciences and Systems*, March 21-23, 2001, The Johns Hopkins University, Baltimore, Maryland, page 117.
- 124.M. Shane and R. Wesel, "Parallel Concatenated Turbo Codes for Continuous Phase Modulation," (invited) *2000 Wireless Comm. and Networking Conf.*, Sept 24-28, 2000, 6 pages.
- 125.W. Shi, T. Sun, and R. D. Wesel, "Optimal Binary Distributed Detection," *2000 International Symposium on Information Theory*, Sorrento, Italy, June 2000, pp. 437.
- 126.R. D. Wesel and X. Liu, "Edge-Profile Optimal Constellation Labeling," *IEEE International Conference on Communications 2000*, New Orleans, LA, June 2000, pp. 1198-1202.
- 127.C. Komninakis, C. Fragouli, A. H. Sayed, and R. D. Wesel, "Adaptive Multi-Input Multi-Output Fading Channel Equalization Using Kalman Estimation," *ICC 2000*, New Orleans, LA, June 2000, pp. 1655-1659.
- 128.Q. Zhang, P. K. Varshney, and R. D. Wesel, "Optimal Distributed Binary Hypothesis Testing with Independent Identical Sensors," *2000 Conference on Information Sciences and Systems*, Princeton University, March 15-17, 2000, 6 pages.

- 129.C. Komninakis and R. D. Wesel, "Pilot-Aided Joint Data and Channel Estimation in Flat Fading," *Comm. Theory Symp. at Globecom 99*, Rio de Janeiro, Brazil, Dec. 5-9, 1999, pp. 2534-9.
- 130.C. Fragouli and R. D. Wesel, "Semi-Random Interleaver Design Criteria," *Communication Theory Symposium at Globecom 99*, Rio de Janeiro, Brazil, December 5-9, 1999, pp. 2352-6.
- 131.C. Komninakis and R. D. Wesel, "Non-Pilot-Aided Iterative Decoding for Joint Data Recovery and Channel Estimation in Fading," *33rd Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, CA. October 24-27, 1999, pp. 1122-1126.
- 132.C. Fragouli, C. Komninakis, A. H. Sayed, R.D. Wesel, "Channel Estimation and Equalization in Fading," *33rd Asilomar Conference on Signals, Systems and Computers*, Pacific Grove, CA. October 24-27, 1999, pp. 1159-1163.
- 133.W. Shi, T. Sun, R. Wesel, "Optimal Binary Thresholds for Distributed Detection in Gaussian Noise," *33rd Asilomar Conf. on Sig., Sys., Comp.*, Pac. Grove, CA. Oct. 24-27, 1999, pp. 675-9.
- 134.K. Lakovic, J. Villaseñor, and R. D. Wesel, "Robust Joint Huffman and Convolutional Decoding," *VTC-Fall-99*, Amsterdam, The Netherlands, September 19-22, 1999, pp. 2551-5.
- 135.C. Komninakis and R. D. Wesel, "Iterative Joint Data and Channel Estimation in Correlated Flat Rayleigh Fading," in proceedings of the *7th International Conference on Advances in Communications and Control*, June 28-July 2, 1999, Athens, Greece, pp. 385-390.
- 136.C. Fragouli and R. D. Wesel, "Convolutional Codes and Matrix Control Theory," in proceedings of the *7th International Conference on Advances in Communications and Control*, June 28-July 2, 1999, Athens, Greece, pp. 317-328.
- 137.R. D. Wesel, "Reduced Complexity Trellis Code Transfer Function Computation," in the *Communication Theory Miniconference in conjunction with ICC 99*, June 6-10, 1999, pp. 37-41.
138. C. Fragouli and R. D. Wesel, "Symbol Interleaved Parallel Concatenated Trellis Coded Modulation," in the *Comm. Theory Miniconf. in conj. with ICC 99*, June 6-10, 1999, pp. 42-46.
139. P. Ormeci, D. L. Goeckel, and R. D. Wesel, "Adaptive Bit-Interleaved Coded Modulation for Time-Varying Channels Using Outdated Fading Estimates," in proceedings of the *33rd Annual Conference on Information Sciences and Systems*, 6 pages.
- 140.H. Zou, H. J. Kim, S. Kim, B. Daneshrad, R. Wesel, W. Mangione-Smith, "Equalized GMSK, Equalized QPSK, and OFDM: A Comparative Study for High-speed Wireless Indoor Data Communications," in *1999 Veh. Tech. Conf.*, May 16-20, 1999, Houston, TX, pp.1106-10.
- 141.A. Bernard, X. Liu, R. Wesel and A. Alwan, "Embedded Joint Source-Channel Coding of Speech using Symbol Puncturing in Trellis Code," in the Proceedings of *ICASSP 99*, vol. 5, Phoenix, AZ, March 1999., pp. 2427-2430.
- 142.A. Bernard, X. Liu, R. Wesel and A. Alwan, "Channel Adaptive Joint Source-Channel Coding of Speech," Proc. *32nd Asilomar Conf. on Sig., Sys. and Comp.*, Pac. Grove, CA, Nov. 98, pp. 357-361.
- 143.W. Shi and R. D. Wesel, "The Effect of Mismatch on Decision-Feedback Equalization and Tomlinson-Harashima Precoding," in *Thirty-Second Asilomar Conference on Signals, Systems, and Computers*, Pacific Grove, CA, November 2-5, 1998, pp. 1743-1747.
- 144.R. D. Wesel and X. Liu, "Analytic Techniques for Periodic Trellis Codes," in *Thirty-Sixth Annual Allerton Conf. on Communications, Control, and Computing*, Sept. 23-25, 1998, pp. 39-48.
- 145.X. Liu and R. D. Wesel, "Profile Optimal 8-QAM and 32-QAM Constellations," in *Thirty-Sixth Annual Allerton Conf. on Comm., Control, and Computing*, Sept. 23-25, 1998, pp. 136-145.
- 146.W. Shi and R. D. Wesel, "When the Best Decision Feedback Equalizer is a Linear Equalizer," in *Thirty-Sixth Annual Allerton Conference on Control, and Computing*, Sept. 23-25, 1998, pp. 338-39.

147. R. D. Wesel, X. Liu, W. Shi, and J. M. Cioffi, "Trellis Codes for Compound Periodic Gaussian Channels," in *Proceedings of the 1998 International Symposium on Information Theory*, August 16-21, 1998, Cambridge, MA, pp. 462.
148. R. D. Wesel, X. Liu, and W. Shi, "Periodic Symbol Puncturing of Trellis Codes," in *proceedings of Thirty-First Asilomar Conf. on Sig., Sys., and Computers*, Nov. 2-5, 1997, pp. 172-6.
149. R. D. Wesel, C. Komninakis, and X. Liu, "Towards Optimality in Constellation Labeling," in *proceedings of the Communication Theory Mini Conference at Globecom 97*, Phoenix, AZ, November 3-8, 1997, pp. 23-27.
150. R. D. Wesel, and J. M. Cioffi, "Joint Interleaver and Trellis Code Design," in *proceedings of Globecom 97*, Phoenix, AZ, November 3-8, 1997, pp. 939-943.
151. R. D. Wesel, and J. Cioffi, "Fundamentals of Coding for Broadcast OFDM," in *Twenty-Ninth Asilomar Conference on Signals, Systems, and Computers*, October 30, 1995, pp. 2-6.
152. R. D. Wesel, and J. Cioffi, "Achievable Rates for Tomlinson-Harashima Precoding," *1995 International Symposium on Information Theory*, September 1995, pp. 399.
153. R. D. Wesel, and J. Cioffi, "Precoding and the MMSE-DFE," Invited paper in *Twenty-Eighth Asilomar Conference on Signals, Systems, and Computers*, November 1, 1994, pp. 1144-1148.
154. R. D. Wesel and R. M. Gray, "Bayes risk weighted VQ and Learning VQ," in *Data Compression Conference*, Snowbird, Utah, March 1994, pp. 400-409.
155. T. M. Cover and R. D. Wesel, "A Gambling Estimate of the Rate-Distortion Function for Images," in *Data Compression Conference*, Snowbird, Utah, March 1994 (abstract only).

BOOK CHAPTERS

1. H. Chan, A. Hodjat, J. Shi, R. D. Wesel and I. Verbauwhede, "Streaming Encryption for a Secure Wavelength and Time Domain Hopped Optical Network," Ch. 14 in *Embedded Cryptographic Hardware* (N. Nedjah and L. Mourelle, eds.). Nova Science Publishers, 2004
2. R. D. Wesel, "Convolutional Encoding" in *Wiley Encyclopedia of Telecommunications*, Edited by John Proakis, John Wiley, 2003.
3. R. D. Wesel, "Error Control" Chapter 6 in *Wireless Multimedia Communications*, Addison Wesley Longman, 1998.

PATENTS

1. R. D. Wesel, K. Vakulinia, S. Ranganathan, D. Divsalar, Haobo Wang, "High Throughput Communication System". U.S. Patent #10,374,759. August 6, 2019.
2. R. D. Wesel, K. Vakulinia, S. Ranganathan, D. Divsalar, "High Throughput Communication System". U.S. Patent #9998260. June 12, 2018.
3. R. D. Wesel, M-C. F. Chang, Y-M. Chang, A. I. Vila Casado, "Lower Complexity Layered Belief Propagation Decoding LDPC Codes". U.S. Patent #8489957, July 16, 2013.

4. A. I. Vila Casado, W.-Y. Weng, R. D. Wesel, N. Moschini, M. Siti, S. Valle, E. Yeo, "Variable-Rate Low-Density Parity Check Codes with Constant Blocklength". U.S. Patent #7802172, September 21, 2010.
5. I. S. Djokovic, R. D. Wesel, E. J. Infusino, M. K. Tsatsanis, "Multi-channel communication system for multiple input, multiple output processing of an encoded signal". U.S. Patent #7415086, August 19, 2008.
6. G. G. Raleigh, Michael A. Pollak, V. K. Jones, R. D. Wesel, "System and Method for I/Q Trellis Coded Modulation," U.S. Patent #6158041, December 5, 2000.
7. R. D. Wesel and J. M. Cioffi, "Transmission System Using Code Designed for Transmission with Periodic Interleaving," U.S. Patent #6125150, September 26, 2000.
8. R. D. Wesel, "Adaptive Frequency Dependent Compensation for Telephone Channels," U. S. Patent #5280525, January 18, 1994.
9. R. L. Daggett and R. D. Wesel, "Echo Protection Tone Detection and Regeneration for Digital Transmission of Facsimile Calls," U. S. Patent #5216519, June 1, 1993.