

Curriculum Vitae

Dr. Dariush Divsalar
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U.S. Citizen

Fellow of Jet Propulsion Laboratory

A JPL Fellow is one who has made extraordinary technical and institutional contributions to JPL over an extended period of time. Fellows are sought out for advice on strategic technical decisions and for establishing the course for JPL's future.

NASA/JPL Senior Research Scientists, website:

http://scienceandtechnology.jpl.nasa.gov/people/d_divsalar/

Google scholar citations:

<http://scholar.google.com/citations?user=CCJSZ5sAAAAJ&hl=en&oi=ao>

UCLA Adjunct professor

<http://www.ee.ucla.edu/adjunct-faculty/>

Education:

1977-78 University of California, Los Angeles (UCLA), Ph. D.
in Electrical Engineering, Dec. 1978.

Major: Communication Systems, Department of
Electrical Engineering.

Minor: Computer System Modeling and Analysis,
Department of Computer Science.

Minor: Applied Mathematics, Department of
Mathematics.

1975-77 University of California, Los Angeles (UCLA),
Engineer Degree, June 1977.

1973-75 University of California, Los Angeles (UCLA) M.S. in
Electrical Engineering, March 1975.

Work Experience:

1978-present. Jet Propulsion Laboratory, California Institute of Technology,
Pasadena, CA.

2015 Fellow

2000 Principal Scientist

1999 Senior Research Scientist

1997 Principal of Engineering Staff.

1989 Senior Member of Technical Staff.

1982 Member of Technical Staff.

1978 Senior Engineer.

Involved in research, development, study and analysis of various aspects of coding, modulations, communication theory and applications for Deep Space Communication System Techniques for Future Space Exploration Missions, Satellite Communications, Mobile Satellite Experiment.

Has made contributions to many research and advanced projects including: VOIR, Venus Balloon, Antenna Arraying, LMSS, MSAT-X, TDA Advanced Systems RTOP's concerning optical communication, coding and modulation techniques.

Has led the Modulation and Coding Research Work unit for NASA's MSAT-X Project.

Made contributions in finding $K=15$, $r=1/4$ convolutional code for the Galileo project.

Was Active in NASA RIMTECH program. Was a consultant for Paradyne through technology transfer in the Civil Programs Office at JPL. Designed a trellis code that was implemented for production.

Was Active in NASA SBIR program. Was technical monitor for Phase I and II SBIR Proposals.

Was in the tiger team for ICE project and made contributions to the analysis of radio loss for ICE.

Made contributions to JPL-FAA Helicopter Project.

Made contributions to NASA ACTS Mobile Terminal (AMT) Project.

Made some contributions to S-band Galileo Mission.

Made several contributions to Military projects on coding and modulation.

Made contributions to the autonomous software-defined radio receivers for Deep Space communications.

Made significant contribution to channel coding for deep space communications.

Proposed new turbo codes and protograph-based LDPC codes to be used in future NASA missions. The proposed codes became CCSDS standard for space applications.

These codes are being used in many NASA missions.

Made contributions since 2007 to Coding, Modulation, and Link Protocol Study for future NASA missions

2012-present UCLA EE Dept. Adjunct Professor. Research collaboration, weekly research group meetings, joint NSF proposals.

1986-1996 Lecturer at UCLA, Electrical Engineering Department, teaching graduate courses in Information Theory, Digital Communications, Coding (TCM, and turbo codes), and Spread Spectrum Communications.

1997-2001 Lecturer at Caltech, Electrical Engineering Department, teaching graduate courses in Random Signals and Communications theory

Teaching accomplishments at Caltech: Taught graduate courses EE162, EE163a, EE163b at Caltech since January 1997. Participated in Ph.D. Qualifying Exams, Ph.D. Candidacy Exams, and Ph.D. defense committees for many graduate students at Caltech. Helped students in their research, gave new ideas for research.

1984-1991 Adjunct Professor at Northrop University, teaching courses in analog and digital communication systems, information theory and error control coding, statistical communication theory, digital communications, probability, stochastic processes, feedback control systems, spread spectrum communications, linear networks, computer networks, digital signal processing.

1982-1996 Distinguished Lecturer at West Coast University, teaching courses in Detection of Signals in Noise, Digital Communication Systems, Coding, Probability, Stochastic Processes, Logic Network Design, Digital Signal Processing, Spread Spectrum.

Current Interests:

Research in digital communication systems, wireless communication systems, bandwidth efficient combined coding modulation techniques, digital signal processing, satellite communications, mobile communications. Channel coding for deep space communications. Spread Spectrum Systems, CDMA, Fast Frequency Hopping, Time Hopping for commercial multiple access systems, Acquisition and tracking for spread spectrum communications, Mutual User Interference Cancellation for CDMA, Turbo codes, LDPC codes and Iterative Decoding for power- and Bandwidth- limited Channels.

Professional Societies: **Fellow of IEEE**, Journal Referee for IEEE societies of Communication and Information Theory. Member of IEEE communication theory and data communication systems technical committees. Technical program representative to International Conference on Communications 1987 and Global Telecommunications Conference, 1989. Technical Program Chairman of Communication Theory Mini-Conference Globecom 93. Organizer and chairman for 16 IEEE conference sessions in the past ten years. Technical Program Chairman of IEEE Communication Theory workshop, Santa Cruz, April 1995.

Editor for Coding Theory and Applications, IEEE Transactions on Communications June 1989-June 1991.

Area Editor for Coding Theory and Applications, IEEE Transactions on Communications July 1991-1996.

Guest Editor: IEEE JOURNAL ON SELECTED AREAS IN COMMUNICATIONS, VOL. 16, NO. 2, FEBRUARY 1998

Senior Technical Consultant IEEE Transactions on Communications 1996-2003

Guest Editor: IEEE JOURNAL ON SELECTED AREAS IN COMMUNICATIONS, VOL. 19, NO. 9, SEPTEMBER 2001

IEEE Paper Award

Best paper of the year award for "The Performance of Trellis Coded Multilevel DPSK in a Fading Mobile Satellite Channel" published in IEEE Transactions on Vehicular Technology, Vol. 37, No. 2, May 1988. Award was given out in 1990.

Joint paper award of the IEEE Information Theory and IEEE Communication Theory societies for “Accumulate Repeat Accumulate Codes” published in April 2007. Award was given in 2008.

Best poster paper award IEEE Communication Theory Workshop (CTW) 2015.

IEEE Transaction on Communications Best Papers over 50 years

D. Divsalar and M. K. Simon, "Multiple Symbol Differential Detection of MPSK," IEEE Transactions on Communications March 1990.

This paper has been selected as one of the best 56 key research papers in communications and networking over the past fifty years. It was published in a book entitled “The Best of the Best, Fifty Years of Communications and Networking Research,” by the Institute of Electrical and Electronics Engineers (IEEE) Press and Wiley-Interscience, 2007.

Highly Cited Publishing Researcher

D. Divsalar was recognized as highly cited researcher for the period 1981-1999. Highly cited comprise less than one-half of one percent of all publishing researchers worldwide with truly extraordinary accomplishments in category of Computer Science.

JPL Publications Best Paper Award

1998 Hugh Fosque best paper for “Code Performance as a function of block size.”

2000 best paper for “A simple tight bound on error probability of block codes with application to turbo codes,” The results also published in the book *Performance analysis of linear codes under ML decoding: A tutorial* by Igal Sason and Shlomo Shamai, NOW Publishers, Delft, the Netherlands, 2006.

Group Achievement Award

Advanced Communication Technology Satellite Mobile Terminal Development Team, 1994.

Project Galileo Team, 1996.

Galileo Orbital Operation Recovery Team, 1997.

Turbo Code Development Team, 1998.

Uplink Coding Team, 2008.

Coding, Modulation, and Link Protocol Study Team, 2009.

NASA Award

NASA Exceptional Engineering Achievement Medal, April 9, 1996.

IEEE Alexander Graham Bell Medal

Recipient of IEEE Alexander Graham Bell Medal in 2014.

Jet Propulsion Laboratory Fellow

For pioneering work in the field of telecommunications and signal processing through the development of elegant, simplistic solutions in coding and modulation that have increased data return from spacecraft and advanced 3G/4G cellular standards for terrestrial communications.

New Technology, NASA Tech Brief awards:

1. NASA Tech Brief award for "Convolutionally Coded Unbalanced QPSK Systems," February 22, 1983. (with J. Yuen)
2. NASA Tech Brief award for "Improved Convolutionally Coded Unbalanced QPSK Systems," February 28, 1984. (with J. Yuen)
3. NASA Tech Brief award for "Trellis-Coded Modulation for 4800-9600 bps Transmission Over a Fading Mobile Satellite Channel," May 1987. (with M. Simon)
4. NASA Tech Brief award for "Multiple Trellis Coded Modulation (MTCM)," August 1987. (with M. Simon)
5. NASA Tech Brief award for "Generalized Multiple Trellis Coded Modulation (MTCM), October 1988. (with M. Simon)
6. NASA Tech Brief award for "Doppler Corrected Differential Detection," November 1988. (with M. Simon)
7. NASA Tech Brief award for "Trellis-Coded MDPSK System with Doppler Correction," March 1989. (with M. Simon)
8. NASA Tech Brief award for "Design of Trellis Codes for Fading Channels," April 1989. (with M. Simon)

9. NASA Tech Brief award for "Double Differential Encoding and Detection in MPSK," March 1989. (with M. Simon)
10. NASA Tech Brief award for "Fast Correction for Doppler in MDPSK Signals," May 1989. (with M. Simon)
11. NASA Tech Brief award for "The Use of Interleaving for Reducing Radio Loss in Trellis Coded Modulation Systems," June 1990. (with M. Simon)
12. NASA Tech Brief award for "Multiple Symbol Differential Detection of MPSK," June 1990. (with M. Simon)
13. NASA Tech Brief award for "Trellis Coded MDPSK with Multiple Symbol," June 1991. (with M. Simon)
14. NASA Tech Brief award for "Maximum-Likelihood Sequence Detection of Non-coherent Continuous Phase Modulation," 1993. (with M. Simon)
15. NASA Tech Brief award for "Multiple Symbol Partially Coherent Detection of MPSK," 1993. (with M. Simon)
16. NASA Tech Brief award for " Pseudo-Coherent Demodulation for Mobile Satellite Systems," 1995. (with M. Simon)
17. NASA Tech Brief award for "Trellis Coding of Two Consecutive Full Response 4-CPFSK with Modulation Index 1/4," 1995. (with C. Weber and H. Lee)
18. NASA Tech Brief award for " A New Interference Cancellation Scheme with Parallel Processing for Code Division Multiple Access (CDMA) Applications," 1997. (with M. Simon and D. Raphaeli)
19. NASA Tech Brief award for "Multiple Turbo Codes for Deep-Space Communications," 1997. (with F. Pollara)
20. NASA Tech Brief award for " Turbo Coding and Decoding for Personal Communications," 1997. (with F. Pollara)
21. NASA Tech Brief award: Serial Turbo Trellis Coded Modulation with Rate-1 Inner Code, February 2000. (with S. Dolinar, and F. Pollara)
22. NASA tech brief award: "A Reduced Complexity Highly Power/Bandwidth Efficient Coded FQPSK System with Iterative Decoding," (with M. Simon), November 12, 2003.

- 23 NASA tech brief award: “Iterative Demodulation and Decoding of Coded Non-Square QAM,” (with L. Li, and S. Dolinar), June 9, 2004.
- 24 NASA tech brief award: “Coupled Receiver-decoders for Low Rate Turbo Codes,” (with J. Hamkins), June 9, 2004.
- 25 NASA tech brief award: “Accumulate-Repeat-Accumulate-Accumulate Codes,” (with S. Dolinar, J. Thorpe) 2005.
- 26 NASA Tech Brief award: Protograph Based LDPC Constructed from Simple Loop Free Encoding Modules, (with S. Dolinar, J. Thorpe, C. Jones) 2005
- 27 NASA tech brief award: “Protograph Based LDPC Codes with Minimum Distance Linearly Growing with Block Size,” (with C. Jones, S. Dolinar, J. Thorpe) 2006.
- 28 NASA tech brief award: “ARA Type Proptograph Codes,” (with A. Abbasfar, C. Jones, S. Dolinar, J. Thorpe, K. Andrews, K. Yao) November 2005.
- 29 NASA tech brief award: “ARA Type Proptograph Codes,” (with A. Abbasfar, C. Jones, S. Dolinar, J. Thorpe, K. Andrews, K. Yao) April 2006.
- 30 NASA tech brief award: “ARA Type Proptograph Codes,” (with A. Abbasfar, C. Jones, S. Dolinar, J. Thorpe, K. Andrews, K. Yao) May 2006.
- 31 NASA tech brief award: “Architecture of an Autonomous Radio,” (with J. Hamkins, M. Simon, S. Dolinar, and H. Shirani-Mehr) 2006.
- 32 NASA tech brief award: Rate Compatible Protograph LDPC Code Family with Linear Minimum Distance, (with S. Dolinar, and C. Jones) 2007.
- 33 NASA tech brief award: A high speed concatenated Hamming and accumulator coded modulation scheme (with S. Dolinar) 2007.
- 34 NASA tech brief award: An LDPC-based code for optical communications, (with M. Barsoum, B. Moision, J. Hamkins) 2007.

- 35 NASA tech brief award: Combined GMSK Communications and PN Ranging, R. Orr, D. Divsalar Oct. 2008.
- 36 NASA tech brief award: Short-Block Protograph-Based LDPC Codes, (with S. Dolinar, and C. Jones), 2010.
- 37 NASA tech brief award: Bounded Angle Iterative Decoding of LDPC Codes (with S. Dolinar, K. Andrews, F. Pollara) April , 2009.
- 38 NASA tech brief award: Rate-Compatible LDPC Codes With Linear Minimum Distance, September (S. Dolinar, C. Jones) 2009.
- 39 NASA tech brief award: LDPC-PPM Coding Scheme for Optical Communication, September (with M. Barsoum, M. Fitz, B. Moision, J. Hamkins) 2009.
- 40 NASA tech brief : Encoders and Decoders for the AR4JA family of LDPC codes, (with K. Andrews, S. Dolinar) Oct. 2015.
- 41 NASA tech brief : Bilayer Protograph Codes for Half-Duplex Relay Channels, (with Thuy Nguyen, Aria Nosratinia), Aug. 2013
- 42 NASA tech brief : Design and Construction of Protograph-Based LDPC Codes, (with Thuy Nguyen, Aria Nosratinia), Oct. 2014
- 43 NASA tech brief : A Free Space Optical Receiver for Data detection and Radio Science Measurements, (with B. Moision, S. Dolinar) June 2015
- 44 NASA tech brief : Photon Blasting, (with B. Moision, B. Erkmen, S. Dolinar) (pending)
- 45 NASA tech brief : Performance and Complexity Estimates for Coded Two-Dimensional Modulations (with S. Dolinar), (to be awarded)
- 46 NASA tech brief : Non-Binary Protograph-Based LDPC Codes with Near-Capacity Thresholds, (with B-Y. Chang, and Lara Dolecek), Feb. 2015
- 47 NASA tech brief : Protograph-Based Raptor-Like Codes, (with T-Y. Chen, J. Wang, and R. D. Wesel), Jan 1, 2014
- 48 NASA tech brief : Non-Binary Protograph-Based LDPC Codes for Short Block Lengths, (with B-Y. Chang, and Lara Dolecek), Sept. 2014
- 49 NASA tech brief : Design of Rate-Compatible Protograph LDPC Codes, (with T. Nguyen, A. Nosratinia), Oct. 2014

- 50 NASA tech brief : Protograph-Based LDPC Bit-Interleaved Coded Modulation, (with T. Nguyen, A. Nosratinia), Jan. 2015

Patents

1. Trellis-Coded Modulation for Transmission-Over Fading Mobile-Satellite Channel," U.S. Patent No. 4,945,549, July 31, 1990. (with M. Simon)
2. Multiple Trellis Coded Modulation, U.S. Patent No. 4,922,507, May 1, 1990. (with M. Simon)
3. Trellis Coded Multi-level DPSK System with Doppler Correction for Mobile Satellite Channels, U.S. Patent No. 5,023,889, June 11, 1991. (with M. Simon)
4. Doppler-Corrected Differential Detection System, U.S. Patent No. 5,007,068, April 9, 1991. (with M. Simon)
5. Multiple Symbol Differential Detection, U.S. Patent No. 5,017,883, May 21, 1991. (with M. Simon)
6. Improved Parallel Interference Cancellation for CDMA Applications, U.S. Patent No. 5,644,592, July1, 1997. (with M. Simon and D. Raphaeli)
7. Hybrid Concatenated codes and Iterative decoding, A Patent filed May 15, 1996. U.S. Patent No. 6,023,783 February 8, 2000. (with F. Pollara)
8. Interleaved Serial Concatenation of Simple Component Codes and Associated Low-Complexity Iterative Decoding, U.S. Patent 7,089,477, August, 2006. (with H. Jin, R. J. McEliece)
9. Serial Turbo Trellis Coded Modulation Using a Serially Concatenated Coder, U.S. Patent 7,243,294 B1, July 10, 2007 (with F. Pollara, S. J. Dolinar)
10. ARA type protograph codes, D. Divsalar, A. Abbasfar, C. Jones, S. Dolinar, J. Thorpe, K. Andrews, K. Yao. US Patent 7343539 , March 11, 2008

11. Encoders for Block-Circulant LDPC codes, D. Divsalar, A. Abbasfar, C. Jones, S. Dolinar, J. Thorpe, K. Andrews, K. Yao, US Patent 7499490, March 3, 2009.
12. Reduced Complexity Coding System Using Iterative Decoding, US Patent 7292654 , November 6, 2007 (with Simon).
13. J. Hamkins, M. Simon, D. Divsalar, S. Dolinar, A. Tkachenko,” *Self-configurable radio receiver system and method for use with signals without prior knowledge of signal defining characteristics*,” US patent 8358723, issued January 22, 2013.
14. Reduced Complexity Coding System Using Iterative Decoding, US Patent 7333571, February 19, 2008 (with Simon).
15. Interleaved Serial Concatenation Forming Turbo-like Codes, US Patent 7716552, May 11, 2010 (with McEliece, Jin, Pollara).
16. Reduced Complexity Coding System using Iterative Decoding, US patent 7693235, April 6, 2010 (with Simon).
17. Serial Turbo Trellis Coded Modulation using a serially concatenated coder, US patent 7770093, August 3, 2010 (with Dolinar and Pollara)
18. Serial Turbo Trellis Coded Modulation Using a Serially Concatenated Coder, Dariush Divsalar, Samuel J. Dolinar, and Fabrizio Pollara, US Patent Number: 8,086,943, issued December 27, 2011
19. Rate Compatible Protograph LDPC Code Family with Linear Minimum Distance,” US patent 8117523, issued February 14, 2012 (with S. Dolinar, and C. Jones).
20. Rate Compatible Protograph LDPC Code Family with Linear Minimum Distance,” US patent 8239746, issued August 7, 2012 (with S. Dolinar, and C. Jones).
21. Rate-Compatible Protograph LDPC codes, US patent 8689083, issued April 1, 2014 (with Thuy Van Nguyen, and Aria Nosratinia)
22. High Order Modulation Protograph Codes, US patent 8832520 issued September 9, 2014 (with Thuy Van Nguyen, and Aria Nosratinia)

Publications:

Books

- Textbook - Introduction to Trellis Coded Modulation with Applications, co-authored with E. Biglieri, P. McLane, M. K. Simon, MacMillan, 1991.
- Book - "Telemetry System," a chapter in "Deep Space Telecommunications systems Engineering," co-authored with J.H. Yuen, P.W. Kinman and M.K. Simon, edited by J. H. Yuen, Plenum Press, 1983.
- Book - "Autonomous Software-Defined Radio Receivers for Deep Space Applications," contributed to two chapters, editors J. Hamkins, M. K. Simon, New Jersey, John Wiley and Sons, 2006.
- Book - "Channel Coding: Theory, Algorithms, and Applications," contributed to Chapter 2. Edited by David Declercq, Marc Fossorier and Ezio Biglieri, Academic Press Library in Mobile and Wireless Communications (Elsevier). Waltham, MA, USA: Jul. 2014.

Refereed Journal Papers

1. D. Divsalar and M. K. Simon, "Spectral Characteristics of Convolutionally Coded Digital Signals," IEEE Trans. on Communications, February 1980.
2. D. Divsalar and M. K. Simon, "The Power Spectral Density of Digital Modulations Transmitted Over Nonlinear Channels," IEEE Trans. on Communications, Vol. COM-30, January 1982.
3. D. Divsalar and J. H. Yuen, "Carrier Arraying with Coupled Phase-Locked Loops for Tracking Improvement," IEEE Trans. on Communications, Special Issue on Phase- Locked Loops, October 1982.
4. D. Divsalar, R. M. Gagliardi and J. H. Yuen, "PPM Performance for Reed- Solomon Decoding Over an Optical-RF Relay Link," IEEE Transactions on Communications, March 1984.

5. D. Divsalar, M. K. Simon and J. H. Yuen, "Trellis Coding with asymmetric Modulations," IEEE Transactions on Communications, Vol. COM-35, No. 2, February 1987.
6. D. Divsalar and M. K. Simon, "Trellis Coded Modulation for 4800-9600 bps Transmission Over a Fading Mobile Satellite Channel," Special Issue on Fading Channels of the IEEE Journal on Selected Areas in Communications, Vol. SAC-5, No. 2, February 1987, pp. 162-175.
7. D. Divsalar and M. K. Simon, "Multiple Trellis Coded Modulation (MTCM)," IEEE Transactions on Communications, April 1988.
8. M. K. Simon and D. Divsalar, "The Performance of Trellis Coded Multilevel DPSK on a Fading Mobile Satellite Channel," IEEE Trans. on Vehicular. Tech., May 1988.
9. M. K. Simon and D. Divsalar, "Doppler Corrected Differential Detection of MDPSK," IEEE Trans. on Comm., February 1988.
10. D. Divsalar and M. K. Simon, "The Design of Trellis Codes for Fading Channels: Performance Criteria," IEEE Transactions on Communications, Vol. COM-36, No. 9, September 1988.
11. D. Divsalar and M. K. Simon, "The Design of Trellis Codes for Fading Channels: Set Partitioning for Optimum Code Design for MPSK Signals," IEEE Transactions on Communications, Vol. COM-36, No. 9, September, 1988.
12. D. Divsalar and M. K. Simon, "The Use of Interleaving for Reducing Radio Loss in Trellis Coded Modulation Systems," IEEE Transactions on Communications, Vol. 38, No. 3, August 1990.
13. D. Divsalar and M. K. Simon, "Multiple Symbol Differential Detection of MPSK," IEEE Transactions on Communications March 1990.
14. D. Divsalar, M. K. Simon and M. Shahshahani, "The Performance of Trellis Coded MDPSK with Multiple Detection," IEEE Transactions on Communications, September 1990.
15. J. H. Yuen, M. K. Simon, W. Miller, F. Pollara, C. R. Ryan, D. Divsalar and J. Marakis, "Modulation and Coding for Satellite and Space Communications," proceedings of the IEEE, Vol. 78, No. 7, July 1990.

16. M. K. Simon and D. Divsalar, "On the Implementation and Performance of Single and Double Differential Detection Schemes," IEEE Transactions on Communications, February 1992.
17. M. K. Simon and D. Divsalar, "Maximum-Likelihood Sequence Detection of Non coherent Continuous Phase Modulation," IEEE Transactions on Communications, January 1993.
18. M. K. Simon and D. Divsalar, "Multiple Symbol Partially Coherent Detection of MPSK," IEEE Transactions on Communications, February 1994.
19. D. Divsalar and M. K. Simon, "Maximum-Likelihood Differential Detection of Uncoded and Trellis Coded Amplitude-Phase Modulation Over AWGN and Fading Channels, Metrics and Performance," IEEE Transactions on Communications, January 1994.
20. H. Lee, D. Divsalar and C. Weber, "Multiple Symbol Trellis Coding for Full Response CPFSK" IEEE Transactions on Communications, May 1996.
21. S. Benedetto, D. Divsalar, G. Montorsi and F. Pollara, " Bandwidth Efficient Parallel Concatenated Coding Schemes," IEE Electronics Letters, November 1995, Vol. 31, No. 24.
22. S. Benedetto, D. Divsalar, G. Montorsi and F. Pollara, "A new algorithm for continuous decoding of turbo codes," IEE Electronics Letters, Feb. 1996.
23. D. Divsalar, and R. J. McEliece, " The Effective Free Distance of Turbo Codes," IEE Electronics Letters, February 96.
24. S. Benedetto, D. Divsalar, G. Montorsi, and F. Pollara, "Serial Concatenation of Interleaved Codes: Performance Analysis, Design, and Iterative Decoding," IEEE Transactions on Information Theory, May 1998.
25. S. Benedetto, D. Divsalar, G. Montorsi, and F. Pollara, "Soft Input Soft Output APP Module for Iterative Decoding of Concatenated Codes," IEEE Communications Letters January 1997.
26. M.K. Simon, and D. Divsalar, "On the Optimality of Classical Coherent Receivers of Differentially Encoded M-PSK," IEEE Communications Letters, May 1997.

- 27 S. Benedetto, D. Divsalar, G. Montorsi, F. Pollara, " Analysis, Design, and Iterative Decoding of Double Serially Concatenated Codes with Interleavers". IEEE Journal on Selected Areas in Communications, Special Issue on Concatenated Coding Techniques and Iterative Decoding: Sailing Toward Channel Capacity, February 98.
- 28 S. Benedetto, D. Divsalar, G. Montorsi, F. Pollara, "Soft-Input Soft-Output Modules for the Construction and Distributed Iterative Decoding of Code Networks," European Transactions on Telecommunications, March-April 98 (invited paper).
- 29 M.K. Simon, D. Divsalar, "Some New Twists to Problems Involving the Gaussian Probability Integral," IEEE Transaction on Communications, February 1998.
- 30 D. Divsalar, M.K. Simon, and D. Raphaeli, "Improved Parallel Interference Cancellation for CDMA," IEEE Transaction on Communications, February 1998.
- 31 D. Raphaeli, and D. Divsalar, " Multiple-Symbol Noncoherent Decoding of Uncoded and Convolutionally Coded Continuous Phase Modulation," Journal of Communications and Networks, December 1999.
- 32 D. Divsalar, S. Dolinar, and F. Pollara, "Iterative Turbo Decoder Analysis Based on Density Evolution," IEEE Journal on Selected Areas in Communications, Vol. 19, No. 5, pp 891-907, May 2001.
- 32 R. Garelo, G. Montorsi, S. Benedetto, D. Divsalar, F. Pollara, "Labelings and Encoders with the Uniform Bit Error Property with Applications to Serially Concatenated Trellis Codes," IEEE Transaction on Information Theory, Jan. 2002.
- 33 Sason, I.; Shamai, S.; Divsalar, D., "Tight exponential upper bounds on the ML decoding error probability of block codes over fully interleaved fading channels ," IEEE Transactions on Communications , Volume: 51 , Issue: 8 , Aug. 2003, Pages:1296 - 1305.
- 34 Benedetto, S.; Montorsi, G.; Divsalar, D. "Concatenated convolutional codes with interleavers," IEEE Communications Magazine, Volume: 41 , Issue: 8 , Aug. 2003
Pages:102 - 109

- 35 D. Divsalar, E. Biglieri, " Upper bounds to error probabilities of coded systems beyond the cutoff rate," IEEE Transaction on Communications, December 2003.
- 36 L. Li, D. Divsalar, S. Dolinar, "Iterative Demodulation, Demapping, and Decoding of Coded Non-Square QAM," , IEEE Communications Letters, January 2005.
- 37 A. Abbasfar, D. Divsalar, K. Yao, " Accumulate-Repeat-Accumulate Codes," IEEE Transaction on Communications, April 2007.
- 38 Simon, M.; Divsalar, D.; "Some Interesting Observations for Certain Line Codes With Application to RFID," IEEE Transactions on Communications, Volume 54, Issue 4, April 2006.
- 39 K. Andrews, D. Divsalar, S. Dolinar, J. Hamkins, C. Jones, and F. Pollara,"The Development of Turbo and LDPC Codes for Deep Space Applications," IEEE proceedings Vol. 95, No. 11, November 2007.
- 40 A. Abbasfar, D. Divsalar, K. Yao, "Reflections on ARA codes," IEEE Information Theory Newsletter, December 2008.
- 41 D. Divsalar, S. Dolinar, C. Jones, and K. Andrews," Capacity Approaching Protograph Codes," IEEE Journal of Selected Areas in Communications, February 2009.
- 42 M. Barsoum, B. Moision, M. Fitz, D. Divsalar, J. Hamkins, "Iterative Coded Pulse-Position-Modulation for Deep-Space Optical Communications," IEEE Transactions on Communications, December 2010.
- 43 Shadi Abu-Surra, Dariush Divsalar, and William Ryan, "Enumerators for Protograph-Based Ensembles of LDPC and Generalized LDPC Codes," IEEE Transactions on Information Theory, February 2011.
- 44 O. Y. Bursalioglu, G. Caire, and D. Divsalar, "A Robust Deep Space Image Transmission Scheme based on Rateless Codes," *IEEE Trans. on Communications*, Vol. 61, No. 8, August 2013.
- 45 T. V. Nguyen, A. Nosratinia, D. Divsalar, "The Design of Rate-Compatible Protograph LDPC codes," IEEE Transactions on Communications, Vol. 60 , No 10, October, 2012.
- 46 T. V. Nguyen, A. Nosratinia, D. Divsalar, "Bilayer Protograph Codes for Half-Duplex Relay," IEEE Transactions on Wireless Communications Vol. 12, No. 5, May 2013.
- 47 T. V. Nguyen, A. Nosratinia, D. Divsalar, "Rate-Compatible Protograph-based LDPC Codes for Inter-Symbol Interference Channels," IEEE Communications Letters

Vol. 17, No. 8, August 2013.

- 48 L. Dolecek, D. Divsalar, Y. Sun, and B. Amiri "Non-Binary Protograph-Based LDPC Codes: Enumerators, Analysis, and Designs," IEEE Trans. on Information Theory, June 2014.
- 49 T-Y. Chen, K. Vakilinia, D. Divsalar, and R. D. Wesel, "Protograph-Based Raptor-Like LDPC Codes," IEEE Transactions on Communications, May 2015.
- 50 K. Vakilinia, S. V. S. Ranganathan, D. Divsalar ; R. D. Wesel, "Optimizing Transmission Lengths for Limited Feedback With Nonbinary LDPC Examples," IEEE TRANSACTIONS ON COMMUNICATIONS, VOL. 64, NO. 6, JUNE 2016.
- 51 F. Sala, C. Schoeny, S. Kabir, D. Divsalar, and L. Dolecek, "On Nonuniform Noisy Decoding for LDPC Codes with Application to Radiation-Induced Errors," IEEE Transactions on Communications, vol. 65 (4), pp. 1438-1450, April 2017.

Refereed Conference Papers

- 1. D. Divsalar and J. K. Omura, "Computational Cut-off Rate for Band limited Linear and Nonlinear Channels Under Mismatch Conditions," Proceedings of Conference on Information Sciences and Systems, Johns Hopkins University, March 1978.
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Short Bio:

Darius Divsalar received the Ph.D. degree in electrical engineering from the University of California, Los Angeles (UCLA), Los Angeles, CA, USA, in 1978. Since then, he has been with the Jet Propulsion Laboratory (JPL), California Institute of Technology (Caltech), Pasadena, CA, USA, where he is a JPL Fellow and Senior Research Scientist. At JPL, he has been involved with developing state-of-the-art technology for advanced deep-space communications systems and future NASA space exploration. He is also an Adjunct Professor with the Department of Electrical Engineering, UCLA. Since 1986, he has taught graduate courses in communications and coding at UCLA and Caltech. He has published more than 250 papers, coauthored a book entitled *An Introduction to Trellis Coded Modulation with Applications*, contributed to three other books, and holds 22 U.S. patents in the aforementioned areas. He was a co-recipient of the 1988 Paper Award of the IEEE Transactions on Vehicular Technology. He was also a co-recipient of the Joint Paper Award of the IEEE Information Theory and IEEE Communication Theory societies in 2008. The IEEE Communication Society has selected one of his papers for inclusion in a book entitled *The Best of the Best: Fifty Years of Communications and Networking Research*, containing the best 56 key research papers ever published in the society's 50-year history. He is a recipient of the 2014 IEEE Alexander Graham Bell Medal. He has received over 50 NASA Tech Brief Awards and a NASA Exceptional Engineering Achievement Medal in 1996. He served as an Area Editor for the IEEE Transactions on Communications from 1989 to 1996. IEEE Fellow since 1997.