Michael Rice

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Education

Ph.D. in Electrical Engineering (1991), Georgia Institute of Technology, Atlanta, GA.
Dissertation: *Adaptive Rate Error Control for Slowly Varying Channels*

B.S. in Electrical Engineering (1987 – Summa Cum Laude), Louisiana Tech University, Ruston, LA.

Experience

Associate Department Chair (2006-2012, 2018-2020)
Department of Electrical and Computer Engineering, Brigham Young University

Professor (2006-present), **Jim Abrams Professor** (2006-2016), **Associate Professor** (1997-2006), **Assistant Professor** (1991-1997)
Department of Electrical and Computer Engineering, Brigham Young University

Visiting Professor (1999-2000)
Institute for Communication Systems and Signal Processing, San Diego State University, San Diego, CA.

NASA/ASEE Summer Faculty Fellow (1994, 1995)
Jet Propulsion Laboratory, Pasadena, CA.

Honors

IEEE AESS Distinguished Service Award, 2022
Pioneer Award, International Foundation for Telemetering, 2019.
Myron Hiram Nichols Telemetry Spectrum Award, International Consortium on Telemetry Spectrum, 2019.
Best Paper Award, International Telemetering Conference, 2019.
Fellow, IEEE, 2017.
Best Paper Award, International Telemetering Conference, 2017.
Phi Kappa Phi Distinguished Faculty Award, Brigham Young University, 2016-2017.
Best Paper Award, International Telemetering Conference, 2015.
Service Award, Communications Theory Technical Committee, IEEE Communications Society, 2013.
Best Paper Award, International Telemetering Conference, 2013.
Excellence in Scholarship Award, Ira. A. Fulton College of Engineering, Brigham Young University, 2013.
Wesley Lloyd Award for Distinction in Graduate Education, Brigham Young University, 2011.
Best Paper Award, International Telemetering Conference, 2010.
Excellence in Citizenship Award, Ira A. Fulton College of Engineering, Brigham Young University, 2008.
Best Paper Award, International Telemetering Conference, 2008.
Best Paper Award, International Telemetering Conference, 2005.
Best Paper Award, International Telemetering Conference, 2004.
Outstanding Faculty Member Award, Dept. of Electrical and Computer Engineering, BYU, 2002.
Engineer of the Year, IEEE Utah Section, 2001.
Faculty Friend Award, San Diego State University, 2000.

Professional Activities

Editor-in-Chief, *IEEE Transactions on Aerospace and Electronic Systems*, 2018 – 2022.
General Chair, International Telemetering Conference, Glendale, AZ, October 2022
Member, IEEE Open Journal for Systems Engineering Editorial Board, 2022

Member, IEEE AESS Fellows Committee, 2022 - present
Member, IEEE AESS Nominations and Elections Committee, 2022 - present
Chair, Best Paper Awards Committee, IEEE Global Communications Conference, 2021.
Technical Program Co-Chair, IEEE Latin American Conference on Communications, 2019.
Member, Best Paper Awards Committee, IEEE International Conference on Communications, 2019.
Member, Best Paper Awards Committee, IEEE Latin American Conference on Communications, 2018.
Board of Governors, IEEE Aerospace & Electronic Systems Society, January 2016 – December 2021.
Editor-in-Chief, *AESS Quarterly Email Blast*, January 2016 – December 2017.
General Chair, International Telemetering Conference, Glendale, AZ, October 2016.
Associate Editor-in-Chief, *IEEE Transactions on Aerospace and Electronic Systems*, 2013 – 2017.
Chair, Best Paper Awards Committee, IEEE International Conference on Communications, 2013.
Chair, Signal Processing and Communications Society Chapter, IEEE Utah Section, 2011 – 2012.
Chair, Communication Theory Technical Committee, IEEE Communications Society, 2009 – 2010.
Communication Theory Symposium Co-Chair, IEEE Global Communications Conference, December 2010, Miami.
Technical Program Committee, IEEE Military Communications Conference, November 2009, Boston, MA.
Co-chair, Communication and Information Theory Symposium, IEEE International Wireless Communications & Mobile Computing Conference (IWCMC) June 2009, Leipzig, Germany.
Organizer, Special Session on Communication Theory, IEEE Waveform Diversity and Design Conference, February 2009, Orlando, FL.
Technical Program Committee, IEEE Military Communications Conference, November 2008, San Diego, CA.
General Chair, IEEE Communication Theory Workshop, May 2009, Napa Valley, CA.
General Chair, International Telemetering Conference, October 2008, San Diego, CA.
Vice Chair, Communication Theory Technical Committee, IEEE Communications Society, 2007 – 2008.
Technical Editor for Command, Control, and Communications, *IEEE Transactions on Aerospace and Electronic Systems*, 2006 – 2016.
Secretary, Communication Theory Technical Committee, IEEE Communications Society, 2005 – 2006.
Northeast Area Chair, IEEE Region 6, 2005 – 2006.
Technical Program Committee, Transmission Technology Track, 2005 Vehicular Technology Conference.
Communication Theory Representation to the General Conference Technical Program Committee, IEEE GLOBECOM 2004.
Organizing Committee, Local Arrangements Chair, IEEE Communication Theory Workshop, 2005, Park City, Utah.
Equalization I Session Chair, WCNC 2004, Atlanta, GA.
Technical Program Chair, 2002 International Telemetering Conference, San Diego, CA
Chair, Signal Processing and Communications Society Chapter of the Utah Section of IEEE, 2001 – 2003, 2013 - 2015.
IEEE Region 6 Student Activities Coordinator, 2001 - 2002.
Chair, IEEE Utah Section, 1997 - 1999.
Short Course, *Digital Communications*, Edwards AFB, Lancaster, CA
Short Course, *Quadrature Modulation for Aeronautical Telemetry* at the 2000 and 2001 International Telemetering Conference.
Short Course, *Error Control Coding* at the 1995, 1997, 1998, 1999 International Telemetering Conference.
Senior Member, IEEE; Member IEEE Communications Society
Chair, Coding & Modulation Session, IEEE ICC, Seattle, WA 1995.
Chair, Error Control Coding II Session, IEEE VTC, Phoenix, AZ 1997
Session Organizer, IEEE GLOBECOM, Phoenix, AZ 1997
Chair, Signal Detections Techniques Session, International Telemetering Conference, San Diego, CA 1996.
Chair, Transmission Efficiency Session, International Telemetering Conference, Las Vegas, NV 1995.
Chair, Signal Processing Session, International Telemetering Conference, San Diego, CA 1994.
Reviewer for *IEEE Transactions on Communications*, *IEEE Transactions on Vehicular Technology*, I*EEE Transactions on Information Theory*, *International Journal on Satellite Communications*.
Consultant TASC, Reading, MA; Cleveland Medical Devices, Cleveland, OH; L-3 Communications, Communication Systems – West, Salt Lake City, UT.

University Committee Work

Member, University Rank and Status Committee, 2021 – 2022.
Associate Chair, Department of Electrical & Computer Engineering, 2018 – 2020.
Member, University Graduate Council, 2012 – 2017.

Member, University Academic Review Committee, 2012 – 2017.
Associate Chair, Department of Electrical & Computer Engineering, 2006 – 2012.
Chair, External Relations Committee, Dept. Electrical & Computer Engineering 2003 – 2006.
Department Newsletter Editor 2003 – 2007.
IEEE Student Branch Advisor. 2004 – 2010.
Graduate Coordinator, Dept. Electrical & Computer Engineering 1996 – 1999.
Member, Graduate Admissions Process Reengineering Team, Brigham Young University, 1998.
Advisor, Society of Women Engineers, College of Engineering & Technology, 1991 – 1994.
Member, Alliance with Industry Committee, College of Engineering & Technology, 1991-1992.

International Academic Service

MSThesis/PhD Dissertation Reviewer: University of British Columbia, Canada, 2008
University of Pretoria, South Africa, 2009
University of Chile, Santiago, Chile 2020

PUBLICATIONS

Journal Papers

1. A. Twitchell and M. Rice, "On Space-Time Block-Encoded 16-APSK in Aeronautical Mobile Telemetry," *IEEE Transactions on Aerospace and Electronic Systems*, vol. 59, no. 4, pp. 3617-3630, August 2023.
2. M. Rice, N. Jensen, L. Landon, B. Redd, A. Twitchell, "On the Nondata-Aided Maximum Likelihood Phase Error Detectors for 16- and 32-APSK," *IEEE Transactions on Aerospace and Electronic Systems*, vol. 59, no. 2, pp. 837-850, April 2023.
3. Carlos Gutiérrez, Willie Harrison, Michael Rice, Benjamin Jensen, Kalin Norman, Bryan Redd, Autumn Twitchell, Marco Cardenas-Juarez, "Envelope Distribution and Doppler Spectrum of V2V Channels at 5.9 GHz in Mountainous Roads," *Vehicular Communications*, vol. 39, pp. 1-17, February 2023.
4. Farah Arabian and Michael Rice, "On Polarization, Combining, and Equalization in Aeronautical Mobile Telemetry*," IEEE Transactions on Aerospace and Electronic Systems*, vol. 58, no. 4, pp. 3601-3612, August 2022.
5. Chad Josephson, Spencer Giddens, Erik Perrins, Willie Harrison, Michael Rice, "Estimators for Space-Time Block-Coded ARTM CPM in Aeronautical Mobile Telemetry*," IEEE Transactions on Aerospace and Electronic Systems*, vol. 58, no. 4, pp. 3353-3369, August 2022.
6. Nathan Nelson, Esteban Garcia, Rachael Harris, Michael Rice, "Cognitive Radio for Aeronautical Mobile Telemetry: A Machine Learning-Based Approach," *IEEE Aerospace and Electronic Systems Magazine*, vol. 37, no. 6, pp. 32-37, June 2022.
7. Bill Rymer and Michael Rice, "The Early U.S. History of Real-Time Telemetry Processing and Display*", IEEE Aerospace and Electronic Systems Magazine*, vol. 37, no. 5, pp. 40-47, May 2022.
8. Michael Rice, "IEEE Transactions on Aerospace and Electronic Systems: A Success Story*", IEEE Aerospace and Electronic Systems Magazine*, vol. 37, no. 5, pp. 49-52, May 2022.
9. Farah Arabian and Michael Rice, "Polarization Combining and Equalization in 5G Mobile-to-Mobile Systems," *IEEE Access*, vol. 10, pp. 45881-45892, 5 May 2022.
10. Chad Josephson, Erik Perrins, Michael Rice, "Space-Time Block-Coded ARTM CPM for Aeronautical Mobile Telemetry," *IEEE Transactions on Aerospace and Electronic Systems*, vol. 58, no. 1, pp. 342-358, February 2022.
11. Farah Arabian, Greg Nordin, Michael Rice, "On the Ungerboeck and Forney Observation Models for Spatial Combining and Their Application to 5G Millimeter-Wave Bands", *IEEE Access*, vol. 9, pp. 22214-22231, 9 February 2021.
12. Michael Rice, Bradford Clark, Dakota Flanary, Benjamin Jensen, Nathan Nelson, Kalin Norman, Ethan Perrins, Willie Harrison, "Physical Layer Security for Vehicle-to-Everything Networks: Increasing Security While Maintaining Reliable Communications," *IEEE Vehicular Technology Magazine*, vol. 15, no. 3, pp. 68-76, September 2020.

13. Md. Shah Afran, Mohammad Saquib, Michael Rice, “On the Effects of Channel Sparsity on Joint Estimators in Aeronautical Telemetry”, *IEEE Transactions on Aerospace and Electronic Systems*, vol. 56, no. 3, pp. 2507 – 2514, June 2020.
14. Michael Rice, et al. “Global Communications Newsletter,” *IEEE Communications Magazine*, vol. 58, no. 3, pp. 5 – 8, March 2020.
15. C. Sacchi, F. Granelli, N. Conci, M. Ruggieri, T. Rossi, K.-M. Cheung, M. Marchese, V. Popescu, M. Rice, M. Murroni, C. Schlegel, M. Noble, “Glue Technologies for Space Systems: An Introduction to a New AESS Technical Panel”, *IEEE Aerospace and Electronic Systems Magazine*, vol. 35, no. 1, pp. 46 – 54, January 2020.
16. Md. Shah Afran, Mohammad Saquib, Michael Rice, “Sparse Equalization in Aeronautical Telemetry Using Two Transmit Antennas”, *IEEE Transactions on Aerospace and Electronic Systems*, vol. 56, no. 2, pp. 830-836, February 2020.
17. Michael Rice and Mike McLernon, “Teaching Communications with SDRs: Making It Real for Students,” *IEEE Communications Magazine*, vol. 57, no. 11, pp. 14 – 19, November 2019.
18. Michael Rice, Christopher Hogstrom, Md. Shah Afran, Mohammad Saquib, “On Sparse Channel Estimation in Aeronautical Telemetry,” *IEEE Transactions on Aerospace and Electronic Systems*, vol. 55, no. 5, pp. 2612 – 2618, October 2019.
19. Michael Rice and Edem Gagakuma, “Approximate MLSE Equalization of SOQPSK-TG in Aeronautical Telemetry,” *IEEE Transactions on Aerospace and Electronic Systems*, vol. 55, no. 2, pp. 769 – 784, April 2019.
20. Michael Rice, Kip Temple, Timothy Chalfant, Darrell Ernst, Carolyn Kahn, “Spectrum Allocations: The Aeronautical Telemetry Story in the USA,” *IEEE Aerospace and Electronic Systems Magazine*, vol. 33, no. 12, pp. 50 – 58, December 2018.
21. Michael Rice, Joseph Palmer, Chris Lavin, and Tom Nelson, “Space-Time Coding for Aeronautical Telemetry: Part II – Decoder and System Performance, “*IEEE Transactions on Aerospace and Electronic Systems*, vol. 53, no. 4, pp. 1732 – 1754, August 2017.
22. Michael Rice, Joseph Palmer, Chris Lavin, and Tom Nelson, “Space-Time Coding for Aeronautical Telemetry: Part I – Estimators, “*IEEE Transactions on Aerospace and Electronic Systems*, vol. 53, no. 4, pp. 1709 – 1731, August 2017.
23. Michael Rice and Andrew McMurdie, “On Frame Synchronization in Aeronautical Telemetry,” *IEEE Transactions on Aerospace and Electronic Systems*, vol. 52, no. 5, pp. 2263 – 2280, October 2016.
24. Brian Mazzeo and Michael Rice, “Bit Error Rate Comparison Statistics and Hypothesis Tests for Inverse Sampling (Negative Binomial) Experiments,” *IEEE Transactions on Communications*, vol. 64, no. 5, pp. 2192 – 2203, May 2016.
25. Michael Rice, “Data-Aided and Non-Data-Aided Maximum Likelihood SNR Estimators for CPM,” *IEEE Transactions on Communications*, vol. 63, no. 11, pp. 4244 – 4253, November 2015.
26. Michael Rice, Md. Shah Afran, and Mohammad Saquib, “Equalization in Aeronautical Telemetry Using Multiple Transmit Antennas,” *IEEE Transactions on Aerospace and Electronic Systems*, vol. 51, no. 3, pp. 2148 – 2165, July 2015.
27. Michael Rice, Aaron Hawkins, Doran Wilde, “The Movement of Light,” *Utah Technology Magazine*, January/February 2014.
28. Christopher Shaw and Michael Rice, "Optimum Pilot Sequences for Data-Aided Synchronization," *IEEE Transactions on Communications*, vol. 61, no. 6, pp. 2546 - 2556, June 2013.
29. Michael Rice, "On the Reversibility of Randomizers and Derandomizers in Aeronautical Telemetry," *IEEE Transactions on Aerospace and Electronic Systems*, vol. 49, no. 2, pp. 1385 - 1391, April 2013.
30. Brian Pratt, Megan Fuller, Michael Rice, and Michael Wirthlin "Reduced-Precision Redundancy for Reliable FPGA Communications Systems in High-Radiation Environments," *IEEE Transactions on Aerospace and Electronic Systems*, vol. 49, no. 1, pp. 369 - 380, January 2013.

31. Michael Rice and Brian Mazzeo, "On the Superiority of the Negative Binomial Test over the Binomial Test for Estimating the Bit Error Rate," *IEEE Transactions on Communications*, vol. 60, no. 10, pp. 2971 - 2981, October 2012.
32. Joseph Palmer and Michael Rice, "Low-Complexity Frequency Estimation Using Multiple Disjoint Pilot Blocks in Burst-Mode Communications," *IEEE Transactions on Communications*, vol. 59, no. 11, pp. 3135 - 3145, November 2011.
33. Tom Nelson and Michael Rice, "Detection of Offset QPSK with Orthogonal Space-Time Block Codes over a Static Channel," *IEEE Transactions on Communications*, vol. 58, no. 7, pp. 1902 - 1906, July 2010.
34. Chris Shaw and Michael Rice, "Turbo-Coded APSK for Aeronautical Telemetry," *IEEE Aerospace and Electronic Systems Magazine*, vol. 25, no. 4, pp. 37 - 43, April 2010.
35. Qiang Lei and Michael Rice, "Multipath Channel Model for Over-Water Aeronautical Telemetry," *IEEE Transactions on Aerospace and Electronic Systems*, vol. 45, no. 2, pp. 735 - 742, April 2009.
36. Michael Rice, "Teaching Digital Communication Theory with Simulink at Brigham Young University," *Matlab Digest: Academic Edition*, vol. 3, no. 2, April 2009.
37. Erik Perrins and Michael Rice, "PAM Representation of Ternary CPM," *IEEE Transactions on Communications*, vol. 56, no. 12, pp. 2020 - 2024, December 2008.
38. Mason Wardle and Michael Rice, "PAM Approach to Weak CPM and Its Application to Flight Termination Receivers," *IEEE Transactions on Aerospace and Electronic Systems*, vol. 44, no. 2, pp. 468 - 480, April 2008.
39. Tom Nelson, Erik Perrins, and Michael Rice, "Near Optimal Common Detection Techniques for Shaped Offset QPSK and Feher's QPSK," *IEEE Transactions on Communications*, vol. 56, no. 5, pp. 724 - 735, May 2008.
40. Erik Perrins, Robert Schober, Michael Rice, and Marvin, Simon, "Multiple-Bit Differential Detection of Shaped-Offset QPSK," *IEEE Transactions on Communications*, vol. 55, no. 12, pp. 2328 - 2340, December 2007.
41. Michael Rice, Travis Oliphant, Osama Haddadin, and William McIntire, "Estimation Techniques for GMSK using Linear Detectors in Satellite Communications," *IEEE Transactions on Aerospace and Electronic Systems*, vol. 43, no. 4, pp. 1484 - 1495, October 2007.
42. Otilia Popescu, Mohammed Saquib, Ditmitrie Popescu, and Michael Rice, "Interference Mitigation in Aeronautical Telemetry Systems using Kalman Filter," *IEEE Transactions on Aerospace and Electronic Systems*, vol. 43, no. 4, pp. 1624 - 1630, October 2007.
43. Erik Perrins and Michael Rice, "Reduced-Complexity Approach to Iterative Detection of Coded SOQPSK," *IEEE Transactions on Communications*, vol. 55, no. 7, pp. 1354 - 1362, July 2007.
44. Erik Perrins and Michael Rice, "Reduced-Complexity Detectors for Multi-h CPM in Aeronautical Telemetry," *IEEE Transactions on Aerospace and Electronic Systems*, vol. 43, no. 1, pp. 286 - 300, January 2007.
45. Michael Jensen, Michael Rice, and Adam Anderson, "Aeronautical Telemetry Using Multiple-Antenna Transmitters," *IEEE Transactions on Aerospace and Electronic Systems*, vol. 43, no. 1, pp. 262 - 272, January 2007.
46. Zhihong Ding and Michael Rice, "ARQ Error Control for Parallel Multichannel Communications," *IEEE Transactions on Wireless Communications*, vol. 5, no. 11, pp. 3039 - 3044, November 2006.
47. Erik Perrins and Michael Rice, "PAM Decomposition of M-ary Multi-h CPM," *IEEE Transactions on Communications*, vol. 53, no. 12, pp. 2065 - 2075, December 2005.
48. Erik Perrins and Michael Rice, "A New Performance Bound for PAM-based CPM Detectors," *IEEE Transactions on Communications*, vol. 53, no. 10, pp. 1688 – 1696, October 2005.
49. Michael Rice and Xiaoyu Dang, "Aeronautical Telemetry Using Offset QPSK in Frequency Selective Multipath," *IEEE Transactions on Aerospace and Electronic Systems*, vol. 41, issue 2, pp. 758-767, June 2005.
50. Michael Rice, Adam Davis, and Christian Bettweiser, "A Wideband Channel Model for Aeronautical Telemetry," *IEEE Transactions on Aerospace and Electronic Systems*, vol. 40, issue 1, pp. 57-69, January 2004.
51. Chris Dick, fred harris, and Michael Rice, "FPGA Implementation of Carrier Synchronization for QAM Receivers," *Journal of VLSI Signal Processing*, Kluwer, vol. 36, issue 1, pp. 57 - 71, January 2004.

52. fred harris, Chris Dick, and Michael Rice, “Digital Receivers and Transmitters Using Polyphase Filter Banks for Wireless Communications,” *IEEE Transactions on Microwave Theory and Techniques*, vol. 51, no. 4, pp. 1395 - 1412, April 2003.
53. fred harris and Michael Rice, “Multirate Digital Filters for Symbol Timing Synchronization in Software Defined Radios,” *IEEE Journal on Selected Areas in Communications*, vol. 19, no. 12, pp. 2346-2357, December 2001.
54. Michael Rice and Erik Perrins, “A Simple Figure of Merit for Evaluating Interleaver Depth for the Land-Mobile Satellite Channel,” *IEEE Transactions on Communications*, vol. 49, no. 8, pp. 1343-1353, August 2001.
55. Michael Rice, Steven Tretter, and Peter Mathys, “On Differentially Encoded M-Sequences,” *IEEE Transactions on Communications*, vol. 49, no. 3, pp. 421-424, March 2001.
56. Michael Rice, “PCM/FM Aeronautical Telemetry in Frequency Selective Multipath Interference,” *IEEE Transactions on Aerospace and Electronic Systems*, vol. 36, no. 4, pp. 1090-1098, October 2000.
57. Michael Rice, Ricky Dye, and Kenneth Welling, “Narrowband Channel Model for Aeronautical Telemetry,” *IEEE Transactions on Aerospace and Electronic Systems*,” vol. 36, no. 4, pp. 1371-1376, October 2000.
58. Greg Ahlquist, Michael Rice, and Brent Nelson “Error Control Coding in Software Radios: An FPGA Approach,” *IEEE Personal Communications Magazine*, vol. 6, no. 4, pp. 35-39, August 1999.
59. Michael Rice, Deborah Pinck, Jeff Slack, and Brian Humpherys, “K-Band Land-Mobile Satellite Channel Characterization Using ACTS,” *International Journal on Satellite Communications,* vol. 14, pp. 283-296, January 1996.
60. Deborah Pinck and Michael Rice, “Analyze Mobile-Radio Propagation in Satellite-Based Systems,” *Wireless Systems and Design*, vol. 1, no. 1 pp. 43-50, January 1996.
61. Michael Rice, “A Geometric Approach to Incomplete Soft-Decision Block Decoding,” *IEEE Transactions on Communications*, vol. 43, no. 4 pp. 1383-1391, April 1995.
62. Michael Rice, “Application of Generalized Minimum Distance Decoding to Hybrid-ARQ Error Control,” *IEEE Transactions on Communications* vol. 42, no. 2 pp. 640-647, February 1994.
63. Michael Rice and Stephen B. Wicker, “A Sequential Scheme for Adaptive Error Control Over Slowly Varying Channels,” *IEEE Transactions on Communications*, vol. 42, no. 4 pp. 1533-1543, April 1994.
64. Michael Rice and Stephen B. Wicker, “Adaptive Error Control for Slowly Varying Channels,” *IEEE Transactions on Communications*, vol. 42, no. 3 pp. 917-926, March 1994.
65. Michael Rice and Stephen B. Wicker, “Modified majority-logic decoding of cyclic codes in hybrid-ARQ systems,” *IEEE Transactions on Communications*, vol. 40, no. 9 pp. 1413-1417, September 1992.

Books and Book Chapters

1. Michael Rice, Equalization Techniques for Single-Carrier Modulations. In: Shen X., Lin X., Zhang K. (eds) *Encyclopedia of Wireless Networks*. Springer, Cham, 2019. ISBN: 978-3-319-32903-1. Available online: https://doi.org/10.1007/978-3-319-32903-1.
2. Joshua Y. Sakamaki, Randal W. Beard, and Michael Rice, "Tracking Multiple Ground Objects Using a Team of Unmanned Air Vehicles" in *Sensing and Control of Autonomous Vehicles: Applications to Land, Water, and Air Vehicles*, Springer, ed. Thor I. Fossen, Kristin Y. Pettersen, Henk Nijmeijer, pp. 249-268, 2017.
3. Michael Rice, “Single-Carrier Modulations,” in *Transmission Techniques for Digital Communications*, ed. Stephen G. Wilson, Sarah Kate Wilson, and Ezio Biglieri. Academic Press Library in Mobile and Wireless Communications, Elsevier, New York, 2016. ISBN: 978-0-12-398281-0.
4. Michael Rice and Tom Nelson, "MIMO Communications Using Offset Modulations," in *Principles of Waveform Diversity and Design*, ed. Michael Wicks, Eric Mokole, Shannon Blunt, Richard Schneible, Vincent Amuso, SciTech Publishers, Raleigh, North Carolina, 2010, pp. 479 - 514. ISBN: 978-1-891121-95-1.
5. Michael Rice *Digital Communications: A Discrete-Time Approach*, Second Edition. Self-published via Kindle Digital Publishing, Amazon.com, 2020. ISBN-13: 979-8680369920.

6. Michael Rice, *Digital Communications: A Discrete-Time Approach*, Self-published via Kindle Digital Publishing, Amazon.com, 2018. ISBN-10: 1790588561. ISBN-13: 978-1790588565.
7. Michael Rice, *Digital Communications: A Discrete-Time Approach*, Pearson Prentice Hall, Upper Saddle River, New Jersey, 2008. ISBN-10: 0130304972. ISBN-13: 978-0130304971.

Invited Presentations

1. Keynote Address: Michael Rice, “Single-Carrier Modulations: Not Dead Yet!” at the IEEE Latin American Conference on Communications, Guadalajara, Mexico, November 2018.
2. Michael Rice, "The Challenges of C-band Missile Telemetry," at the International Telemetering Conference, San Diego, CA 22-25 October 2012.
3. Michael Rice, "C-Band Channel Characteristics: What Does the Science Teach Us? What Does Experience Teach Us?" at the International Telemetering Conference, Las Vegas, NV, 24-27 October 2011.
4. Michael Rice, "Equalization Techniques for Multipath Channels," Expert Lecture at the Software Defined Radio Forum Technical Conference, Washington, DC, 30 November - 3 December 2010.
5. Michael Rice, "Simulink and Digital Communications - A Perfect Match for the Classroom," The MathWorks Virtual Conference, Track 4 - Explore MATLAB and Simulink in Academia, October 2010.
6. Chris Shaw and Michael Rice, "Turbo-coded APSK for Aeronautical Telemetry," in *Proceedings of the IEEE International Waveform Design and Diversity Conference*, Orlando, FL, 8-13 February 2009.

Conferences

202 articles published in proceedings of international conferences and symposia

Funding

Grants and Contracts as PI

2022-2023, Multi-antenna CDMA MRC Receiver Follow-on, $67,068, L3Harris Technologies, Inc.

2022-2022, Multi-antenna CDMA MRC Receiver, $19,686, L3Harris Technologies, Inc.

2017-2020, Space-Time Coding for Multi-h CPM, $2,445,808, National Spectrum Consortium.

2016-2018, Coded APSK for Aeronautical Telemetry, $658,636, National Spectrum Consortium (via University of Kansas).

2013–2017, Preamble-Assisted Equalization for Aeronautical Telemetry, $1,580,270, Test Resources Management Center.

2009–2011, Multipath Modeling and Mitigation Using Multiple Antennas, $684,177, Test Resources Management Center.

2009–2010, Turbo-Coded APSK for Aeronautical Telemetry – Part 2, $100,000, Test Resources Management Center.

2008–2009, Turbo-Coded APSK for Aeronautical Telemetry, $100,000, Test Resources Management Center.

2005–2009, Prototype Design for Aeronautical Telemetry Space-Time Decoder System, $893,452, CTEIP/USAF Edwards AFB (with Michael Jensen and Brent Nelson)

2005, SHF Channel Modeling for Aeronautical Telemetry (continuation), $51,000 S&T T&E, Edwards AFB.

2004, SHF Channel Modeling for Aeronautical Telemetry (continuation), $11,070, S&T T&E, Edwards AFB.

2002, SHF Channel Modeling for Aeronautical Telemetry, $50,000, Jet Propulsion Laboratory.

2002, Performance of EFTS in the Presence of Interference, $30,000, NASA.

2002, Space-Time Coding for Aeronautical Telemetry, $99,920, S&T T&E, Edwards AFB (with Michael Jensen)

2002, SHF Channel Modeling for Aeronautical Telemetry, $243,022, S&T T&E, Edwards AFB.

2002, Aeronautical Telemetry Multipath Analysis and Mitigation (continuation), $99,999 ARTM Program, Edwards AFB.

2001, Aeronautical Telemetry Multipath Analysis and Mitigation Support (continuation), $99,999 ARTM Program, Edwards AFB.

2000, Robust Command Links for Flight Termination, $72,034, NASA

2000, Aeronautical Telemetry Multipath Analysis and Mitigation, $100,001, ARTM/Edwards AFB

1999, An Investigation of Advanced Range Telemetry, $49,996, AFOSR

1998, A Comprehensive Investigation of Advanced Range Telemetry, $25,000, AFOSR

1998, Channel Characterization, ARTM, $28,364, Edwards AFB.

1996, K-Band Mobile Satellite Channel Characterization, $75,000, Jet Propulsion Laboratory.

Grants and Contracts as co-PI

2007, NSF Center for High-Performance Reconfigurable Computing (with Brent Nelson, Michael Wirthlin, and Brad Hutchings)

2004, Advanced Wireless Communication Technology (with Michael Jensen and Lee Swindlehurst), $642,238, Utah State Centers of Excellence.

2004, Distributed Communications and Control for Multiple Miniature Unmanned Air Vehicles (with Lee Swindlehurst – PI, Michael Jensen, Brian Jeffs, Randal Beard Brent Nelson, Todd Moon and J. Gunther), $1,124,191, NSF

2003, Differential Space-Time Coding for Aeronautical Telemetry, $99,980, S&T T&E, Edwards AFB (with Michael Jensen – PI)

2003, ITR: Multi-User, Multi-Antenna Networks: Achieving High Capacity in a Mutual Interference Environment (with Lee Swindlehurst – PI, Michael Jensen, and Brian Jeffs), $354,042, NSF.

2000, ITR/SII: Analysis of the Capacity Improvement for Wireless Networks with Multiple Transmit And Receive Antennas (with Lee Swindlehurst – PI , Brian Jeffs, Michael Jensen), $488,761, NSF.

2000, Development of a Comprehensive Real-Time Instrument for MIMO Wireless Channel Measurement and Space-Time Coding Implementation (with Lee Swindlehurst – PI, Michael Jensen, and Brian Jeffs) $370,576, NSF

1999, Modeling and Design for the Lower Layers of Fourth Generation Indoor/Outdoor Wireless Networks (with Lee Swindlehurst – PI, Michael Jensen, and Brian Jeffs) $698,000, NSF.

Donations

2012, Support for Wireless Networking Senior Project, $20,000, L-3 Communications, Communication Systems – West

1993 – 2002, BYU Telemetry Program Endowment, $650,000, International Foundation for Telemetering.

2001, Support for the Software Radio Senior Project, $25,000, L-3 Communications, Communication Systems – West.

1999 – present ITC Student Travel Grants, $32,000, International Foundation for Telemetering.

Biography for Journal Papers

Michael Rice (M'82 SM'98 F'17) received the Ph.D. degree in electrical engineering from Georgia Tech, Atlanta, GA, USA, in 1991. He was with Digital Transmission Systems, Inc., Atlanta, GA, USA, and joined the faculty with Brigham Young University, Provo, UT, USA, in 1991, where he is currently a Professor with the Department of Electrical and Computer Engineering. During 1994 and 1995, he was a NASA/ASEE Summer Faculty Fellow with the Jet Propulsion Laboratory, Pasadena, CA, USA, where he worked on land mobile satellite systems. During the 1999 and 2000 academic year, he was a Visiting Scholar with the Communication Systems and Signal Processing Institute, San Diego State

University. He has been a consultant to both Government and Industry on telemetry related issues and currently serves as an Associate Member of the Telemetry Group of the Range Commander's Council. His research interests include digital communication theory and statistical signal processing with a special emphasis on applications to aeronautical telemetry and software radio design.

Dr. Rice is a Member of the IEEE Communications Society and is the Past Chair of the Communication Theory Technical Committee. He is also a Member of the Aerospace and Electronic Systems Society and past Member of the Board of Governors for the Aerospace and Electronic Systems Society. He was the Editor-in-Chief for IEEE TRANSACTIONS ON AEROSPACE AND ELECTRONIC SYSTEMS from 2018 to 2022. He is a Fellow of the IEEE for contributions to communication waveforms, detection algorithms, and channel models for aeronautical telemetry.

PhD Students Supervised

Farah Arabian. Dissertation: *Multipath Mitigation in Frequency Selective Channels with an Emphasis on 5G Cellular Mobile Networks and Aeronautical Mobile Telemetry Applications* (2022)

Chad Josephson. Dissertation: *Space-Time Coded ARTM CPM for Aeronautical Mobile Telemetry* (2021)

Christopher Shaw. Dissertation: *Modulation and Synchronization for Aeronautical Telemetry* (2014)

Xiaoyu Dang. Dissertation: *Offset QPSK for MIMO Communications* (2009)

Joseph Palmer (with Prof. Brent Nelson) Dissertation: *Real-Time Carrier Frequency Estimation Using Disjoint Pilot Symbol Blocks* (2009)

N. Tom Nelson. Dissertation: *Space-Time Coding for Aeronautical Telemetry* (2007)

Zhihong Ding. Dissertation: *ARQ Techniques for MIMO Communications Systems* (2006)

Erik Perrins. Dissertation: *Reduced Complexity Detection Methods for Continuous Phase Modulation* (2005)

MS Students Supervised

Autumn Twitchell. Thesis: *Space-Time Block-Encoded 16-APSK in Aeronautical Mobile Telemetry* (2022)

Robert Leatham. Thesis: *Space-Time Coding for Advanced Range Telemetry Continuous Phase Modulation* (2020)

Christopher Hogstrom. Thesis: *A Survey of Sparse Channel Estimation in aeronautical Telemetry* (2017)

Jeffrey Ravert. Thesis: *GPU Implementation of Data-Aided Equalizers* (2017)

Edem Gagakuma. Thesis: *Multipath Channel Considerations in Aeronautical Telemetry* (2017)

Andrew McMurdie. Thesis: *Frame Synchronization Techniques for iNET-Formatted SOQPSK-TG Communications* (2015)

Darren Kartchner. Thesis: *Simulating the Performance of Tracking a Spinning Missile at C-band* (2013)

Grant Wagner. Thesis: *Polarization Diversity in the Presence of Multipath Propagation* (2013)

Jacob Frogget. Thesis: *Automatic Modulation Recognition for Aeronautical Telemetry* (2013)

Segun Tenubi. Thesis: *Wireless Sensor Network Approach to Aeronautical Telemetry* (2010)

Mason Wardle. Thesis: *A PAM Representation of Weak CPM* (2005)

Vladimir Paje. Thesis: *Equalization Techniques in Aeronautical Telemetry* (2005)

Kejing Liu. Thesis: *Architectures for Symbol Timing Synchronization for MIMO Communications* (2004)

David DeGaston. Thesis: *An FPGA-Based Simulation Platform for Aeronautical Telemetry* (2001)

Adam Davis. Thesis: *A Wideband Channel Model for Aeronautical Telemetry* (2001)

Kenneth Welling. Thesis: *Coded Orthogonal Frequency Division Multiplexing on the Aeronautical Telemetry Channel* (1999)

David Landon. Thesis: *Channel Dynamics of ARTM Channel Sounding Data: A Model of a Low-Altitude, Wideband, Air-to-Ground Telemetry Channel* (1999)

Lyman Horne. Thesis: *Simulated Diversity Performance of PCM/FM in the Presence of Multipath Fading* (1999)

Erik Perrins. Thesis: *Interleaver Design for the Land Mobile Satellite Channel* (1998)

Daniel Friend. Thesis: *Reed-Solomon Codes as a Multipath Fading Countermeasure for PCM/FM Aeronautical Telemetry* (1996)

Ricky Dye. Thesis: *Signal Strength Analysis of Angle Modulated Data in the Presence of Multipath Fading* (1996)

Jeff Slack. Thesis: *Finite State Markov Models for Error Bursts on the Land Mobile Satellite Channel* (1996)

Brian Humpherys. Thesis: *Statistical Models for the ACTS K-Band Land Mobile Satellite Channel* (1996)

Michael Josie. Thesis: *Soft-Decision Decoding Based on Successive Encoding* (1995)

N. Tom Nelson. Thesis: *Performance of PCM/FM in the Presence of Multipath Fading* (1995)

David Moore. Thesis: *Adaptive Rate Error Control for a Wireless ATM Network* (1994)

Rory Fisher. Thesis: *Adaptive MPSK Modulation for Slowly Varying Channels* (1994)

Kevin Rhodes. Thesis: *Analysis of Modified Generalized Minimum Distance Decoding on Flat Fading Channels with Applications* (1994)