

Robert Henry Morelos-Zaragoza, Ph.D.

Professor, Department of Electrical Engineering, San Jose State University

1 Washington Square, San Jose, CA 95192-0084

Tel: 1-408-924-3879

Email: robert.morelos-zaragoza@sjsu.edu

Areas of expertise and interest

Error-correcting coding, and digital signal processing, applications in wireless communication systems and networks. Radio-frequency identification (RFID) systems and cognitive software-defined radio.

Education

- PhD.EE (1992) University of Hawaii. Thesis: *Multilevel Error Correcting Codes*. Advisor: Shu Lin
- MSEE (1987) National University of Mexico (UNAM). Thesis: *Design of a Viterbi Decoder*. Advisor: Francisco Garcia-Ugalde
- BSEE (1985) National University of Mexico (UNAM). Thesis: *Analysis and Simulation of Cyclic Error Correcting Codes*. Advisor: Francisco Garcia-Ugalde

Academic and Professional Experience

- Professor (August 2012 - present) Electrical Engineering, San Jose State University
- Associate Professor (August 2002 - August 2012) Electrical Engineering, San Jose State University
- Research Associate, Courtesy Appointment (2005 - 2006) University of California at Santa Cruz
- Researcher (August 1999 - June 2002) Advanced Telecommunication Laboratory, Sony CSL, Tokyo, Japan
- Staff Member (1997 - 1999) LSI LOGIC Corporation, Milpitas, CA, U.S.A.
- Research Associate (1995 - 1997) Institute of Industrial Science, University of Tokyo, Tokyo, Japan
- Research Fellow (1994 - 1995) Nara Institute of Science and Technology, Nara, Japan
- Endowed Chair on Intelligent Information Processing Systems (1993 - 1994) Osaka University, Japan
- Assistant Professor (1992 - 1993) Instituto Tecnológico y de Estudios Superiores Monterrey, Mexico

Consulting experience

- Mongolian Ministry of Education, Science, Culture and Sports; Asian Development Bank; Mongolian University of Science and Technology (2016-2017). Project: *Development and implementation of an academic and research curriculum for signal processing*
- Iberium Communications (2007-2010). Project: *Analysis and implementation in C++ and Matlab of LDPC and Golay decoders for Chinese terrestrial digital TV receivers*
- SanDisk (2006). Project: *Implementation in C of algorithms that correct a large number of errors in flash memories*
- Intel Corporation (2004). Project: *Analysis of error correction algorithms for high-performance memory servers*

Courses taught

EE 98	Introduction to Circuit Analysis (Fall 2014, Summer 2014, 2016 and 2018, Spring 2022)
EE 112	Linear Systems (Spring 2010)
EE 160	Principles of Communication Systems (Spring 2003-2006, 2010-2011, Fall 2003-2021)
EE 161	Digital Communication Systems (undergraduate) (Spring 2007-2022)
EE 210	Linear Systems Theory (Spring 2010, Fall 2009-2011)
EE 250	Probability and Random Processes (Fall 2002-2003, 2007, 2010-2013)
EE 251	Digital Communication Systems (graduate) (Spring 2003-2004, 2006, 2011-2015, Fall 2003, 2005, 2006-2009, 2017-2021)

- EE 252 Advanced Communication Systems (Spring 2003-2018, 2021. Fall 2012-2015)
- EE 253 Digital Signal Processing (Spring 2018-2020)
- EE 259 Selected topics in Signal Processing: Software-Defined Radio (Fall 2013, 2015)
- EE 259 Free Space Optical Communications (Lockheed Martin Cohort Summer 2013)
- EE 260 RFID Systems (Spring 2012-2016, Spring 2020)
- EE 265 Hands-on wireless communications using software radios (Fall 2014-2021)
- EE 296M Error Correcting Codes (experimental) (Fall 2005, 2007)
- EE 296W Radio Frequency Identification (RFID) Systems (experimental) (Fall 2007, 2008)

Professional service

- Co-Chair, 2017 IEEE International Conference on Smart City Innovations (IEEE SCI 2017), San Francisco, CA, August 4-8, 2017.
- Co-Chair, 2016 International Symposium on Information Theory and Its Applications (ISITA2016), Monterey, CA, Nov. 6-9, 2016.
- Associate Technical Editor, IEEE Communications Magazine, 2012-2017
- ABET (program assessment) coordinator, EE Department, SJSU, 2006-2017
- Technical program committee (TPC) member of numerous peer-reviewed conferences:
 - CSI'22, IAICT'2021, IEEE ICC 2021, IoTaIS'2021, SOFTT 2021,
 - IEEE ICC 2018, SETCAC'18, IoTaIS 2018,
 - ISWTA 2017, ICCEREC 2017, GLOBECOM 2016, ICCEREC 2016
 - SMART 2015, APWiMob 2015, PIAMSE'2015, ICOCOE'2015, ICCEREC 2015, ITU Kaleidoscope 2015 and GLOBECOM 2015
 - NTMS 2014, ISITA 2014, ICCST 2014, ISCAIE 2014, APWiMob 2014, ICOCOE 2014, ISMET 2014, I4CT'2014, ELECTROMASA'2014 and ICT-14
 - SMART 2013, WCES 2013, ISIEA2013, ISWTA2013, ICWiSe2013 and CSA 2013
 - NTMS 2012, WCES 2012, WC 2012, SMART 2012, ISWTA 2012, ISIEA 2012, PECON 2012, MACOM 2012, SoftCOM 2012 and APACE 2012
 - RWS 2011, MobiCONA 2011, NTMS 2011, WCES 2011, ICCST 2011, ICISA2011 and ICC 2011
 - RWS 2010, ISITA 2010 and ICCST 2010, RWS 2009 and ICC 2009
 - RWS 2008, ICC 2008, ITST 2008, WINSYS 2008 and ISITA 2008
 - ISWPC 2007 and WCECS 2007, GLOBECOM 2006 and ISITA 2006
 - WNET 2005, WirelessComm 2005, ISWCS 2005 and ICC 2005
 - WPMC 2002, ISITA 2004 and WNET 2004
- Reviewer, IEEE Trans. on Wireless Communications, 2002-2003 and 2005-2015
- Reviewer, IEEE Trans. on Communications, 2000-2015
- Reviewer, IEEE Communications Magazine, 2012-2014
- Reviewer, IEEE Trans. on Vehicular Technology, 2004-2010
- Reviewer, IEICE Trans. on Communications, 2000-2010 and IEEE Comm. Letters, 2002-2008
- Reviewer, European Transactions on Telecommunications, 2007
- Reviewer, IEEE Trans. on Info. Theory, 1998-2003, 2004 and 2006
- Reviewer, EURASIP J. Wireless Communications and Networking, 2003-2004
- NSF panelist, May 2003

Honors and awards

- Fulbright U.S. Scholar in Mongolia, Spring 2017
- DARPA Spectrum Challenge finalist (Team SJSU Spartans), March 2013
- Visiting Fellow, Japanese Society for the Promotion of Science, Osaka University, January 2009
- Best paper award, IEEE WPMC 2001 conference, 2001

- Research Fellow, Japanese Society for the Promotion of Science, Nara Institute of Science and Technology, 1995
- Member, Eta Kappa Nu, 1992
- Chairman, IEEE University of Hawaii Student Branch, 1991
- E.E. Black Fellowship, University of Hawaii, 1989
- Gabino Barreda Medal, National Autonomous University of Mexico, 1988
- Dean's List (Honorific mention), Faculty of Engineering, National Autonomous University of Mexico, 1985

Publications

BOOK

The Art of Error Correcting Coding, second edition, John Wiley & Sons, 2006. Translated to Chinese and Russian.

JOURNAL PAPERS

1. Reversible Data Hiding with a New Local Contrast Enhancement, Fragoso-Navarro, E.; Cedillo-Hernandez, M.; Garcia-Ugalde, F.; Morelos-Zaragoza, R., submitted to *Mathematics*, 2022.
2. Consideration for Affects of an XOR in a Random Number Generator Using Ring Oscillators, Sato, R.; Koder, Y.; Ali, M.A.; Kusaka, T.; Nogami, Y.; Morelos-Zaragoza, R.H., *Entropy* 2021, 23, 1168
3. Juarez-Sandoval, O.U.; Reyes-Ruiz, L.J.; Garcia-Ugalde, F.; Cedillo-Hernandez, M.; Ramirez-Hernandez, J.; Morelos-Zaragoza, R. Additional Information Delivery to Image Content via Improved Unseen–Visible Watermarking. *Electronics* 2021, 10, 2186.
4. Algebraic group structure of the random number generator: Theoretical analysis of NTU sequence(s), (coauthors: {Koder, Y., Ali, Md.A., Miyazaki, T., Kusaka, T., Nogami, Y. and Uehara, S.}), *IEICE Transactions on Fundamentals of Electronics, Communications and Computer Sciences*, vol. E102-A, no. 12, pp. 1659-1667, Dec. 2019.
5. Well Balanced Multi-value Sequence and its Properties over Odd Characteristic Field, (co-authors: Arshad Ali, M., Koder, Y., Fazle Rabbi, M., Kusaka, T., Nogami, Y. and Uehara, S.), *Advances in Science, Technology and Engineering Systems*, vol. 4, no. 4, pp. 188-196, April 2019.
6. Distribution of bit patterns in binary sequence generated over sub extension field, (co-authors: Ali, M.A. Koder, Y. Kusaka, T. Nogami, Y. and Uehara S.), *Advances in Science, Technology and Engineering Systems*, vol. 4, no. 2, pp. 370-379, Feb. 2019.
7. Multi-Value Sequence Generated over Sub Extension Field and Its Properties, (coaauthors: M.A. Ali, Y. Koder, Yuta, T. Kusaka, S. Ueharaand Y. Nogami), *Journal of Information Security*, vol. 10, no. 3, pp. 130-154, July 2019.
8. Multi-valued Sequences Generated by Power Residue Symbols over Odd Characteristic Fields, (coauthors: B. Nasima, Y. Nogami and S. Uehara), *IEICE Transactions on Fundamentals and Electronics, Communications and Computer Science*, Vol.E100-A, No.4, pp. 922-929, Apr. 2017.
9. A Multi-Value Sequence Generated by Power Residue Symbol and Trace Function over Odd Characteristic Field, (coauthors: Y. Nogami, S. Uehara, K. Tsuchiya, N. Begum and H. Ino), *IEICE Transactions on Fundamentals and Electronics, Communications and Computer Science*, Vol.E99-A, No.12, pp. 2226-2237, Dec. 2016.
10. On the Error Performance of Coding and Equalization in Low-Complexity Ultra-Wideband Communication Systems, *Journal of Communication Software and Systems*, vol. 2, no. 3, pp. 245-251, November 2006.

11. Method of Non-Data-Aided Carrier Recovery with Modulation Identification, (coauthors: K. Umebayashi and R. Kohno), *IEICE Transactions on Fundamentals and Electronics, Communications and Computer Science*, vol. E87-A, no. 3, pp. 656-665, March 2004.
12. Statistical Mechanics of Broadcast Channels Using Low Density Parity Check Codes, (coauthors: K. Nakamura, D. Saad and Y. Kabashima): cond-mat/0204622, unpublished (2002), *Physical Review E*, March 2003.
13. A Software Radio Receiver with Direct Downconversion and Its Digital Signal Processing, (coauthors: S. Haruyama, M. Abe, N. Sasho, L. Michael and R. Kohno), *IEICE Trans. Communications*, Special Issue on Software Defined Radio Technology and Its Applications, vol. E85-B, no. 12, pp. 2741-2749, December 2002.
14. A Software-Defined Radio Platform with Direct Conversion: SOPRANO, (coauthors: S. Haruyama and Y. Sanada), in *Kluwer International Journal on Wireless Personal Communications*, vol. 23, no.1, pp. 67-76, October 2002.
15. A Two-Stage Decoder for Pragmatic Trellis-Coded M-PSK Modulation Using a Symbol Transformation, (coauthor: A. Mogre), *IEEE Transactions on Communications*, vol. 49, no. 9, pp. 1501-1505, September 2001.
16. Tradeoffs Between Error Performance and Decoding Complexity in Multilevel 8-PSK Codes and Multistage Decoding with UEP Capabilities, (coauthors: M. Isaka, M.P.C. Fossorier, S. Lin and H. Imai), *IEICE Transactions on Fundamentals and Electronics, Communications and Computer Science*, Vol.E83-A, No.8, pp.1704-1712, August 2000.
17. Multilevel Coded Modulation for Unequal Error Protection and Multistage Decoding - Part II: Asymmetric Constellations, (coauthors: M. Isaka, M.P.C. Fossorier, S. Lin and H. Imai), *IEEE Transactions on Communications*, vol. 48, no. 5, pp. 774 -786, May 2000.
18. Multilevel Coded Modulation for Unequal Error Protection and Multistage Decoding - Part I: Symmetric Constellations, (coauthors: M.P.C. Fossorier, S. Lin and H. Imai), *IEEE Transactions on Communications*, vol. 48, no. 2, pp. 204-213, February 2000.
19. Constructions of Generalized Concatenated Codes and Their Trellis-Based Decoding Complexity, (coauthors: T. Fujiwara, T. Kasami, and S. Lin), *IEEE Transactions on Information Theory*, vol. 45, no. 2, pp. 725-731, March 1999.
20. Coded Modulation for Satellite Broadcasting Based on Unconventional Partitioning, (coauthors: M. Isaka, M.P.C. Fossorier, S. Lin and H. Imai), *IEICE Transactions on Fundamentals and Electronics, Communications and Computer Science*, vol. E81-A, no.10, pp.2055-2063, October 1998.
21. Binary Multilevel Convolutional Codes with Unequal Error Protection Capabilities, (coauthor: H. Imai), *IEEE Transactions on Communications*, vol. 46, no. 7, pp. 850-853, July 1998.
22. On Block-Coded Modulation Using Unequal Error Protection Codes over Rayleigh-Fading Channels, (coauthors: H. Imai, T. Kasami and S. Lin), *IEEE Transactions on Communications*, vol. 46, no. 1, pp. 1-4, January 1998.
23. Error Performance of Multilevel Block Coded 8-PSK Modulations Using Unequal Error Protection Codes for the Rayleigh Fading Channel, (coauthors: N. Uetsuki, T. Takata, T. Kasami and S. Lin), *IEICE Transactions on Fundamentals and Electronics, Communications and Computer Science*, vol. E80-A, no. 6, pp. 1143-1149, June 1997.
24. Coded Modulation for Satellite Video Broadcasting, (coauthors: O.Y. Takeshita and H. Imai), *IEICE Transactions on Fundamentals and Electronics, Communications and Computer Science*, vol. E79-A, no. 9, pp. 1355-1360, September 1996.
25. On Primitive BCH Codes with Unequal Error Protection Capabilities, (coauthor: S. Lin), *IEEE Transactions on Information Theory*, Vol. 41, No. 3, pp. 788-790, May 1995.
26. QPSK Block Modulation Codes for Unequal Error Protection, (coauthor: S. Lin), *IEEE Transactions on Information Theory*, Vol. 41, No. 2, pp. 576-581, March 1995.

27. On Trellis Structure of LUEP Block Codes and A Class of UEP QPSK Block Modulation Codes, *IEICE Transactions on Fundamentals and Electronics, Communications and Computer Science*, Vol. 77-A, No. 8, pp. 1261-1266, August 1994.
28. On a Class of Optimal Nonbinary Linear Unequal-Error-Protection Codes for Two Sets of Messages, (coauthor: S. Lin), *IEEE Transactions on Information Theory*, Vol. 40, No. 1, pp. 196-200, January 1994.
29. A Note on Repeated-Root Cyclic Codes, *IEEE Transactions on Information Theory*, Vol. 37, No. 6, p. 1736, November 1991.

CONFERENCES

1. Rotor fault detection of squirrel cage induction motor using spectrum analysis of dynamic simulation and experimental validation, (co-authors: A. Purvee and E. Tsend-Ayush), *Proc. 2019 IEEE Energy Conversion Congress and Expo*, pp. 1623-1628, Baltimore, Sep. 29-Oct. 3, 2019.
2. Bit distribution of binary sequence generated by trace function and Legendre symbol over sub extension field, (co-authors: Arshad Ali, M. and Koder, Y. and Heguri, S. and Kusaka, T. and Uehara, S.), *Proc. 2018 ACM International Conference on Information Technology (ICIT 2018)*, pp. 92-96, Hong Kong, December 2018.
3. Evaluating the Maximum Order Complexity of a Uniformly Distributed Sequence Over Odd Characteristic, (coauthors: Y. Koder, T. Kusaka, T. Miyazaki, Y. Nogami and S. Uehara), *Proc. 2018 IEEE International Conference on Consumer Electronics-Taiwan (ICCE-TW)*, pp. 1-2, May 19-21, 2018.
4. Reliability Improvements to Healthcare Patient RFID Tracking with Multiple Tags, (coauthors: F. Antar, M. Jain, H. Dugyala and D. Nelluri), *Proc. 2017 IEEE SmartWorld*, pp. 1-5. San Francisco, CA, Aug. 2017.
5. Linear complexity of pseudo random binary sequence generated by trace function and Legendre symbol over proper sub extension field, (coauthors: A. M. Arshad, T. Miyazaki, S. Heguri, Y. Nogami, S. Uehara), *Proc. 2017 Eighth International Workshop on Signal Design and Its Applications in Communications (IWSDA 2017)*, pp. 84-88, Sapporo, Japan.
6. Multi-value Sequence Generated by Trace Function and Power Residue Symbol Over Proper Sub Extension Field, (coauthors: A. Ali, T. Miyazaki, Y. Nogami and S. Uehara), accepted in the *2017 IEEE International Conference on Consumer Electronics-Taiwan (ICCE-TW-2017)*, Taiwan, 2017.
7. A new approach for generating well balanced Pseudo-random signed binary sequence over odd characteristic field, (coauthors: A.M. Arshad, Y. Nogami, C. Ogawa, H. Ino, S. Uehara and K. Tshuchiya), *Proc. 2016 International Symposium on Information Theory and Its Applications (ISITA 2016)*, pp. 777 - 780, Monterey, CA, Oct. 30-Nov. 2-29, 2016.
8. An Application of the Power Residue Symbol for Generating Multi-Value Sequences over Odd Characteristic Fields (co-authors: H. Ino, Y. Nogami and S. Uehara), *The 30th International Technical Conference on Circuits/Systems, Computers and lCommunications (ITC-CSCC 2015)*, Seoul, Korea, June 29-July 2, 2015.
9. A Consideration on Crosscorrelation of a kind of Trace Sequences over Finite Field, (coauthors: H. Ino, Y. Nogami, N. Begum, S. Uehara and T. Kazuyoshi), *Proc. 2015 IEEE International Symposium on Computing and Networking (CANDAR 2015)*, pp. 484-486, Dec. 8, 2015.
10. Precoding by Priority: A UEP Scheme for RaptorQ Codes (coauthor: K. Elliadka), *Proc. 2014 International Symposium on Information Theory and Its Applications (ISITA 2014)*, pp. 269 - 273, Melbourne, Australia, October 26-29, 2014.

11. Using Software Defined Radios to teach Wireless Communication Courses, Tutorial Presentation, *The 2014 Wireless Innovation Forum (SDR WinnComm 2014)*, Schaumburg, Illinois, March 11-13, 2014.
12. Implementing Alamouti's 2x1 Transmit Diversity on Software Defined Radio (coauthor: A. Ansari), *The International Conference on Engineering of Reconfigurable Systems and Algorithms (ERSA 2013)*, Las Vegas, NV, July 22, 2013.
13. Unequal Error Protection with CRC-16 Bits in EPC Class-1 Generation-2 UHF RFID Systems, *Proc. 2012 International Symposium on Information Theory and its Applications (ISITA 2012)*, pp. 36-40, Honolulu, Hawaii, October 28-31, 2012.
14. On Error Performance Improvements of Passive UHF RFID Systems via Syndrome Decoding, *Proc. 2011 IEEE International Conference on Internet of Things (iThings 2011)*, pp. 127-130, Dalian, China, October 19-22, 2011.
15. Two-Level Channel Coding for Cooperative Wireless Networks Based on WiMAX LDPC codes, (coauthor: N. D'souza), *Proc. IEEE PIMRC 2011, Workshop on Wireless Distributed Networks*, pp. 2349-2353, Toronto, Canada, Sep. 11, 2011.
16. On Iterative Decoding of Two-Level Superposition Codes for Cooperative Broadcasting Based on QPSK and 4-PAM Constellations, *Proc. IEEE 2010 Military Communications Conference (MILCOM 2010)*, pp. 2369-2374, San Jose, CA, Oct. 31-Nov. 3, 2010.
17. On Two-Level Superposition Coding for Cooperative Broadcasting in Wireless Networks, *Proc. 15th Asia-Pacific Conference on Communications (APCC 2009)*, pp. 342-345, Shanghai, China, October 8-10, 2009.
18. A Trade-off Analysis of Energy Detectors and Partitioned Search for Primary Detection, (coauthors: B. Sirceci and V. Sawant), presented in the 2nd IEEE International Conference on Cognitive Networks and Communications (COGCOM 2009), *Proc. IEEE ICCCN 2009*, pp. 1-4, San Francisco, CA, Aug. 2-6, 2009.
19. An Adaptive Adjacent Channel Interference Cancellation Technique, (coauthor: Shobha Kuruba), *Proc. 9th Wireless World Congress*, pp. 1-4, San Jose, CA, May 14-15, 2008 and Shanghai China, August 2009.
20. Automatic Transmit Power Control of a Digital Fixed Wireless Link with Co-Channel Interference, (coauthors: K.-W. Suh, and J.-H. Lee), *Proc. of IEEE ChinaCom2007-WCN*, pp. 1178-1184, Shanghai, China, Aug. 22-24, 2007.
21. On Coding Techniques for Dense Multipath Channels, *Proc. of 2007 Hawaii and SITA Joint Conference on Information Theory (HSIC)*, pp. 63-66, Honolulu, Hawaii, May 29-31, 2007.
22. On an OFDM-UWB System with Two-Tap Adaptive Linear LMS Equalization, (coauthors: B. Mau and L. Wong), *Proc. of GSPx 05 Conference*, Santa Clara, CA, Oct. 24-27, 2005.
23. A Suboptimal Receiver with Turbo Block Coding for Ultra-Wideband Communications, (coauthors: T. Becker and S. Aquino), *Proc. of IEEE WirelessComm 2005*, pp. 618-623, Communication Theory Symposium, Kaanapali Beach, Maui, Hawaii, June 13-15, 2005.
24. Error Performance of Two-Tap LMS Equalization in an OFDM-UWB System, (coauthors: B. Mau and L. Wong), *Proc. of 2005 Global Mobile Congress (GMC'05)*, Chongqing, China, Oct. 10-12, 2005.
25. Modulation Identification and Carrier Recovery System for Adaptive Modulation in Satellite Communications, (coauthors: K. Umebayashi and R. Kohno), *Proc. of IEEE VTC Spring 2005 conference*, May 30 - June 1, 2005, Stockholm, Sweden.
26. Asymmetric Modulation for Cognitive Radio and Intelligent Environments, (coauthor: E. Kreb), *Proc. of the 2004 SDR Forum Technical Conference (SDR'04)*, Phoenix, Arizona, Nov. 15-18, 2004.

27. Evaluation of a Multimode PLL using Modulation Identification for the ISDB-S Standard, (coauthors: K. Umebayashi and R. Kohno), *Proc. of the 2004 SDR Forum Technical Conference (SDR'04)*, Phoenix, Arizona, Nov. 15-18, 2004.
28. On Channel Capacity, Constellation Labeling and Demapping for BICM with 64-QAM Modulation, (coauthor: T. Tsai), *Proc. of the 2004 International Symposium on Information Theory and its Applications (ISITA 2004)*, Parma, Italy, Oct. 10-13, 2004.
29. On Channel Capacity, Constellation Labeling and Demapping for BICM using a 32-ary Constellation, (coauthor: T. Tsai), *7th International Symposium on Wireless Personal Multimedia Communications (WPMC 2004)*, Abano Terme, Italy, Sept. 12-15, 2004.
30. Feedforward Carrier and Symbol Timing Recovery and Phase-Invariant Signaling for Software-Defined Radio, (coauthors: E. Kreb, B. Tay and E. Wen), *Proc. 2003 Software Defined Radio Technical Conference (SDR'03)*, Orlando, Florida, Nov. 17-19, 2003.
31. Method of Non-Data-Aided Carrier Recovery with Modulation Identification and its Application as an Adaptive Modulation Scheme, (coauthors: K. Umebayashi and R. Kohno), *Proc. 2003 Software Defined Radio Technical Conference (SDR'03)*, Orlando, Florida, Nov. 17-19, 2003.
32. Multimode PLL for Adaptive Modulation Scheme in Satellite Communication, (coauthors: K. Umebayashi and R. Kohno), *Proc. of the Sixth International Symposium on Wireless Personal Multimedia Communications (WPMC 2003)*, Yokosuka, Japan, October 19-22, 2003.
33. Further Results on Combined Beamforming and Space-Time Block Coding with Sparse Array Antennas, (coauthor: M. Ghavami), *Proc. 2003 Communications Design Conference*, San Jose, California, Sept. 30-Oct. 2, 2003.
34. Statistical Mechanics of Broadcast Channels Using Low Density Parity Check Codes , (coauthors: K. Nakamura, Y. Kabashima and D. Saad), *Proc. IEEE 2003 International Symposium on Information Theory (ISIT 2003)*, p. 294, Yokohama, Japan, June 29 - July 4, 2003.
35. Combined Beamforming and Space-Time Block Coding with a Sparse Array Antenna, (coauthor: M. Ghavami), *Proc. of the Fifth International Symposium on Wireless Personal Multimedia Communications (WPMC 2002)*, pp. 432-434, Honolulu, Hawaii, Oct. 27-30, 2002.
36. On the Phase-Lock Detector of a Multimode PLL for Modulation Identification, (coauthors: K. Umebayashi and R. Kohno), *Proc. 2002 International Symposium on Information Theory and its Applications (ISITA 2002)*, pp. 595-598, Xian, China, October 7-11, 2002.
37. Look-up Table Based Fast Erasure Correction and Conditional Access Techniques for Streaming Media, (coauthor: M.J. Mihaljevi'c), Sony ATL Technical Report, March 2002.
38. On Iterative Cochannel Interference Suppression for the Downlink of a Binary Block Coded Multiuser System, (coauthor: R. Kohno), *Proc. ICFS 2002*, pp. S7-22-27, Waseda University, Tokyo, Japan, March 27-28, 2002.
39. A Method of Non-Data-Aided Carrier Recovery with Modulation Identification, (coauthors: K. Umebayashi and R. Kohno), *Proc. 2001 Symposium on Information Theory and Its Applications (SITA 2001)*, pp. 723-726, Kobe, Hyogo, Japan, Dec. 4-7, 2001. NOTE: This paper is in Japanese.
40. An RF Circuit Architecture for Software Defined Radio Receivers, (coauthors: M. Abe, N. Sasho and S. Haruyama), *Proc. 2001 Microwave Workshops and Exhibition (MWE'01)*, Yokohama, Japan, Dec. 2001.
41. A Method of Non-Data-Aided Carrier Recovery with Modulation Identification, (coauthors: K. Umebayashi and R. Kohno), *Proc. of the 2001 IEEE Global Communications Conference (GLOBECOM 2001)*, pp. 3375 -3379, San Antonio, Texas, November 25-29, 2001.

42. Software Radio with Mixer-less Direct Conversion: SOPRANO, (coauthor: S. Haruyama), *Proc. of the IEEE Semiannual Vehicular Technology Conference (VTC-2001/Fall)*, pp. 1558 -1560, Atlantic City, NJ, USA, October 7-11, 2001.
43. Combined Beamforming and Space-Time Block Coding for High-Speed Wireless Indoor Communications, (coauthor: M. Ghavami), *Proc. of the Fourth International Symposium on Wireless Personal Multimedia Communications (WPMC'01)*, pp. 1427-1431, Aalborg, Denmark, Sept. 9-12, 2001.
44. A Software Radio Platform with Direct Conversion: SOPRANO, (coauthors: S. Haruyama and Y. Sanada), *Proc. of the Fourth International Symposium on Wireless Personal Multimedia Communications (WPMC'01)*, pp. 237-240, Aalborg, Denmark, Sept. 9-12, 2001.
45. On Interference Cancellation and Iterative Techniques, (Invited paper. Coauthor: R. Kohno), *Proc. of the 2001 IEEE Information Theory Workshop (ITW'01)*, pp. 39-41, Cairns, Australia, Sep. 2-7, 2001. Presentation slides (PS format).
46. Adaptive Carrier Recovery with Modulation Identification, (coauthor: K. Umebayashi), *Proc. 2001 International Symposium on Signals, Systems, and Electronics (ISSSE'01)*, pp. 216-219, Tokyo, Japan, July 24-27, 2001.
47. A Carrier Recovery Technique Using Modulation Identification, (coauthor: K. Umebayashi), *Proc. 2001 International Conference on Third Generation Wireless and Beyond (3GWireless'01)*, pp. 933-938, San Francisco, CA, May 30-June 2, 2001.
48. Software Defined-Radio Platform with Mixer-less Direct Conversion: SOPRANO, (coauthor: S. Haruyama), *Proc. 7th IEICE Workshop on Software Radio*, pp. 41-44, Tokyo, Japan, April 26, 2001. Presentation slides (PDF format).
49. Variable-Rate Coding Using Extended Cyclic Codes, (coauthor: F. Swarts), *Proc. 2000 International Symposium on Information Theory and Its Applications (ISITA 2000)*, pp. 774-777, Honolulu, Hawaii, November 5-8, 2000.
50. Universal Platform for Software Defined Radio, (coauthors: R. Kohno, M. Abe, N. Sasho, S. Haruyama, E. Sousa, F. Swarts, P. Van Rooyen, Y. Sanada, L. Michael, H. Amir-Alikhani and V. Brankovich), *Proc. of the 2000 International Symposium on Intelligent Signal Processing and Communication Systems (ISPACS 2000)*, pp. 523-526, Honolulu, Hawaii, Nov. 5-8, 2000.
51. Architectural Issues of Soft-Decision Iterative Decoders for Binary Cyclic Codes, *Sony ATL Internal Report*, Aug. 9, 2000.
52. On the Error Performance of 8-VSB TCM Decoders for ATSC Terrestrial Broadcasting of Digital Television, (coauthor: D. Rhee), *Proc. of the 2000 IEEE International Symposium on Information Theory (ISIT'2000)*, p. 218, Sorrento, Italy, June 2000.
53. Error Performance of Multilevel Codes for Unequal Error Protection over Fading Channels with Coherent Detection and Phase Jitter, (coauthors: M. Isaka and H. Imai), *Proc. of the 2000 IEEE International Symposium on Information Theory (ISIT'2000)*, p. 138, Sorrento, Italy, June 2000.
54. Joint Phase-Lock Detection and Identification of Digital M-PSK/M-QAM Modulation, *Proc. of the 2000 International Conference on Third Generation Wireless Communications (3GWireless'00)*, pp. 272-279, San Francisco, CA, June 14-16, 2000.
55. A Two-Stage Decoder for Pragmatic Trellis-Coded PSK/QAM Modulation Using a Symbol Transformation, *Proc. of the 1999 Symposium on Information Theory and Its Applications (SITA'99)*, pp. 753-756, Niigata, Japan, Nov. 30-Dec. 3, 1999.
56. Error Performance of 8-VSB TCM Decoders for ATSC Terrestrial Broadcasting of Digital Television, (coauthor: D. Rhee), *Proc. of the 13th AAECC Symposium on Applied Algebra, Algebraic Algorithms and Error-Correcting Codes (AAECC-13)*, p. 29, Honolulu, Hawaii, Nov. 15, 1999.

57. Multilevel Codes and Multistage Decoding for Unequal Error Protection, (coauthors: M. Isaka, H. Imai, M.P.C. Fossorier and S. Lin), *Proc. of IEEE International Conference on Personal Wireless Communications (ICPWC99)*, pp. 249-254, Feb. 17-19, 1999.
58. Phase Jitter Effects on Multilevel Codes with Multistage Decoding, (coauthors: M. Isaka and H. Imai), *Proceedings of the 1998 Symposium on Information Theory and Its Applications (SITA'98)*, Gifu, Japan, Dec. 2-5, 1998.
59. Multilevel Coded 16-QAM Modulation with Multistage Decoding for Unequal Error Protection, (coauthors: M. Isaka, M.P.C. Fossorier, S. Lin and H. Imai), *Proceedings of the 1998 IEEE Global Communications Conference (GLOBECOM'98)*, vol. 6, pp. 3548 -3553, Sydney, Australia, November 8-12, 1998.
60. Tradeoffs between Error Performance and Decoding Complexity in Multilevel Coding and Multistage Decoding with UEP Capabilities, (coauthors: M. Isaka, M.P.C. Fossorier, S. Lin and H. Imai), *Proceedings of the 1998 International Symposium on Information Theory and Its Applications (ISITA'98)*, pp. 537-540, Mexico City, Mexico, October 14-16, 1998.
61. Error Performance Analysis of Multilevel Coded Asymmetric 8-PSK Modulation with Multistage Decoding and Unequal Error Protection, (coauthors: M. Isaka, M.P.C. Fossorier, S. Lin and H. Imai), *Proceedings of the 1998 IEEE International Symposium on Information Theory (ISIT'98)*, p. 210, MIT, Cambridge, August 17-21, 1998.
62. Error Performance Analysis of a Concatenated Coding Scheme with 64/256-QAM Trellis Coded Modulation for the North American Cable Modem Standard, (coauthor: D. Rhee), *Proceedings of the 1998 IEEE International Symposium on Information Theory (ISIT'98)*, p. 61, MIT, Cambridge, August 17-21, 1998.
63. Practical multilevel coding and multistage decoding for satellite broadcasting, in *Technical Report of IEICE*, SST98-2, SAT98-8, Jun. 1998.
64. Error performance analysis of multilevel coded 16-QAM modulation with multistage decoding and unequal error protection, in *Technical Report of IEICE*, RCS98-54, Jun. 1998.
65. Error Performance Analysis of Multilevel Coded Asymmetric Modulation with Multistage Decoding and Unequal Error Protection, (coauthors: M. Isaka, M.P.C. Fossorier, S. Lin and H. Imai), *IEICE Technical Report*, IT97-58, Jan. 1998, and IEICE IT Meeting, Tokyo, Japan, January 27, 1998.
66. Error Performance of Multilevel Coded 8-PSK Modulation for Unequal Error Protection over a Rayleigh Fading Channel, (coauthors: M.P.C. Fossorier, S. Lin and H. Imai), *Proceedings of the 1997 Symposium on Information Theory and Its Applications (SITA'97)*, pp. 729-732, Matsuyama, Japan, Dec. 2-5, 1997.
67. The Performance of Block Coded Modulation for UEP with Nonuniform Constellations and Unconventional Partitioning, (coauthors: M. Isaka, M.P.C. Fossorier, S. Lin and H. Imai), *Proceedings of the 1997 Symposium on Information Theory and Its Applications (SITA'97)*, pp. 285-288, Matsuyama, Japan, Dec. 2-5, 1997.
68. Coded Modulation for Satellite Broadcasting Based on Unconventional Partitioning, (coauthors: M. Isaka, M.P.C. Fossorier, S. Lin and H. Imai), *Proceedings of the Fourth European Conference on Satellite Communications*, Rome, Italy, November 18-20, 1997.
69. On Coded Modulation for Unequal Error Protection, (coauthors: M. Isaka and H. Imai), *Proceedings of the 1997 IEICE Autumn Society Conference*, Tokyo, Japan, September 3-6, 1997.
70. Concatenated Multilevel Coded Modulation Schemes for Digital Satellite Broadcasting, (coauthor: H. Imai), *Proceedings of the 1997 IEEE Pacific Rim Conference on Communications, Computers and Signal Processing (PACRIM'97)*, pp. 870-873, Victoria, Canada, August 20-22, 1997.

71. On Coded 8-PSK Modulations for Unequal Error Protection Based on Nonstandard Partitioning, (coauthors: M. Isaka and H. Imai), presented at IEICE IT Meeting, Kagawa, Japan, May 30, 1997, and in Technical Report of IEICE, IT97-10 (1997-5).
72. On Block Coded 16-QAM Modulation for Unequal Error Protection, (coauthor: H. Imai), *Proceedings of the 1997 IEICE Spring General Conference*, Osaka, Japan, March 25, 1997.
73. On the Error Performance of Multilevel Block Coded 8-PSK Modulations for Unequal Error Protection over Rayleigh Fading Channels, (coauthors: M.P.C. Fossorier, S. Lin and H. Imai), *Proceedings of the 1997 Conference on Information Sciences and Systems (1997 CISS)*, Baltimore, MD, March 19-21, 1997.
74. Variable-Rate Coding Schemes with Convolutional Codes and Generalized Concatenation, (coauthor: H. Imai), *Proc. 12th International Symposium on Algebra, Algebraic Algorithms and Error-Correcting Codes (AAECC-12)*, Toulouse, France, June 23-27, 1997.
75. Multilevel Block Coded Modulation with Unequal Error Protection, (coauthors: M.P.C. Fossorier, S. Lin and H. Imai), *Proc. 1997 IEEE International Symposium on Information Theory (ISIT'97)*, p. 441, Ulm, Germany, June 29-July 4, 1997.
76. Binary Convolutional Codes with Two Levels of Error Protection, (coauthor: H. Imai), *Proceedings of the 1996 Symposium on Information Theory and Its Applications (SITA'96)*, pp. 213-216, Hakone, Japan, December 1996.
77. Bandwidth Efficient Multilevel Block Coding Schemes with Two Levels of Protection for 8-PSK Modulation over the AWGN Channel, (coauthors: M.P.C. Fossorier, H. Imai and S. Lin), *Proceedings of the 1996 Symposium on Information Theory and Its Applications (SITA'96)*, pp. 217-220, Hakone, Japan, December 1996.
78. Coded Modulation for Satellite Broadcasting, (coauthors: O.Y. Takeshita, H. Imai, M.P.C. Fossorier and S. Lin), *Communication Theory Mini-Conference Record (GLOBECOM'96)*, pp. 31-35, London, U.K., November 19-21, 1996.
79. Some Results on Three-level BCH Coded 8-PSK Modulations for Unequal Error Protection, (coauthors: M.P.C. Fossorier, S. Lin and H. Imai), *Technical Report of IEICE*, vol. 96, no. 311, pp. 25-30, IEICE, October 1996.
80. A Variable-Rate Coding Scheme based on Multilevel Convolutional Codes, (coauthor: H. Imai), *Proceedings of the Japan-Canada International Workshop on Multimedia Wireless Communications and Computing (WMWCC'96)*, pp. 15-16, Victoria, B.C., Canada, September 17, 1996.
81. Multilevel Convolutional Codes based on a Generalized Concatenation Approach, (coauthor: H. Imai), *Proceedings of the 1996 International Symposium on Information Theory and Its Applications (ISITA'96)*, pp. 815-818, Victoria, B.C., Canada, September 17-20, 1996.
82. Constructions of Generalized Concatenated Codes and Their Trellis-Based Decoding Complexity, (coauthors: T. Fujiwara, T. Kasami, and S. Lin), *Proceedings of the 1996 International Symposium on Information Theory and Its Applications (ISITA'96)*, pp. 286-289, Victoria, B.C. Canada, September 17-20, 1996.
83. Multilevel Constructions of Convolutional Codes using a Generalized Concatenated Approach, (coauthor: H. Imai), *Technical Report of IEICE*, vol. 95, no. 590, pp. 43-48, IEICE, April 1996.
84. Coded Modulation Techniques for Satellite Broadcasting of Digital High Definition TV, (coauthors: O.Y. Takeshita and H. Imai), presented at the *Mediterranean Workshop on Coding and Information Integrity*, Palma de Mallorca, Spain, February 29, 1996.
85. New Coded Modulations for Satellite Video Broadcasting, (coauthors: H. Imai and O.Y. Takeshita), *Proceedings of the 18th Symposium on Information Theory and Its Applications (SITA '95)*, pp. 195-198, Hanamaki, Japan, October 24-27, 1995.

86. Error Performance Analysis of Multilevel Block Coded 8-PSK Modulations Using Unequal Error Protection Codes for the Rayleigh Fading Channel, (coauthors: N. Uetsuki, T. Takata, T. Kasami and S. Lin), *Proceedings of the 18th Symposium on Information Theory and Its Applications (SITA '95)*, pp. 191-194, Hanamaki, Japan, October 24-27, 1995.
87. Multilevel Block Coded 8-PSK Modulations Using Unequal Error Protection Codes for the Rayleigh Fading Channel, (coauthors: T. Kasami and S. Lin), *Proceedings of the 1995 Sixth IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC '95)*, vol. 2, pp. 486-490, Toronto, Canada, September 27-29, 1995.
88. Multilevel Block Coded 8-PSK Modulation Using Unequal Error Protection Codes for Rayleigh Fading Channels, (coauthors: T. Kasami and S. Lin), *Proceedings of the 1995 IEEE International Symposium on Information Theory (ISIT '95)*, p. 154, Whistler, B.C., Canada, September 17-22, 1995.
89. New Methods for Computing the Weight Distribution of a Linear Block Code Based on Its Trellis Structure, (coauthors: T. Fujiwara, T. Kasami and Y. Desaki), *Proceedings of the 1994 International Symposium on Information Theory and Its Applications (ISITA'94)*, Vol. 1, pp. 25-28, Sydney, Australia, Nov. 20-25, 1994.
90. Block QPSK Modulation Codes with Two Levels of Error Protection, (coauthor: S. Lin), *Proceedings of the Fifth IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC'94)*, Vol. II, pp. 548-552, The Hague, The Netherlands, September 18-22, 1994.
91. Unequal Error Protection Capabilities of Some Binary Primitive BCH Codes, (coauthor: S. Lin), *Proceedings 1994 IEEE International Symposium on Information Theory (ISIT'94)*, p. 501, Trondheim, Norway, June 27-July 1, 1994.
92. The State Complexity of Trellis Diagrams for a Class of Generalized Concatenated Codes, (coauthors: T. Fujiwara, T. Kasami, and S. Lin), *Proceedings 1994 IEEE International Symposium on Information Theory (ISIT'94)*, p. 471, Trondheim, Norway, June 27-July 1, 1994.
93. Primitive BCH Codes with Unequal Error Protection Capabilities, (coauthor: S. Lin), *Proceedings of the 1993 International Symposium on Communications (ISC'93)*, Vol. 2, pp. 20-5-8, Taiwan, ROC, December 7-10, 1993.
94. The State Complexity of Trellis Diagram for a Class of Generalized Concatenated Codes, (coauthors: T. Fujiwara, T. Kasami and S. Lin), *Proceedings of the 16th Symposium on Information Theory and Its Applications (SITA'93)*, pp. 21-24, Kanazawa, Japan, October 19-22, 1993.
95. On Trellis Structure of LUEP Block Codes and A Class of UEP QPSK Block Modulation Codes, *Proceedings of the 16th Symposium on Information Theory and Its Applications (SITA'93)*, pp. 283-286, Kanazawa, Japan, October 19-22, 1993.
96. QPSK Modulation Codes for Unequal Error Protection, (coauthor: S. Lin), *Proceedings of the 1993 IEEE International Symposium on Information Theory (ISIT'93)*, p. 184, San Antonio, Texas, Jan. 17-22, 1993.
97. Unequal Error Protection QPSK Modulation Codes, (coauthor: S. Lin), *Proceedings of the 1992 International Symposium on Information Theory and Its Applications (ISITA'92)*, pp. 1121-1125, Singapore, November 16-20, 1992.
98. Binary Two-Level Error Correcting Codes and Their Decoding, (coauthor: S. Lin), *The 26th Annual Conference on Information Sciences and Systems (1992 CISS)*, Princeton University, March 18-20, 1992.
99. Some Results on Linear Unequal-Error-Protection Codes, (coauthor: S. Lin), *Proceedings of the 7th International Conference AAECC-7*, New Orleans, LA, October 7-10, 1991, published in *Lectures Notes in Computer Science*, Vol. 539, pp. 259-268, Springer-Verlag, Berlin, Germany, 1991.

100. On a Class of Optimal Nonbinary Linear Unequal-Error-Protection Codes for Two Sets of Messages, (coauthor: S. Lin), *Proceedings of the 1990 International Symposium on Information Theory and Its Applications (ISITA'90)*, Vol. 1, pp. 35-38, Honolulu, Hawaii, November 27-30, 1990.
101. Package for simulation of error correcting codes (coauthor: F.J. Garcia-Ugalde), *Presente, Pasado y Futuro de las Ciencias de la Computacion en Mexico*, 1988, UNAM, pp. 150-154.
102. Design of a Viterbi Decoder with Microprocessor-Based Serial Implementation, (coauthor: F.J. Garcia-Ugalde), *Proceedings of the 4th International Conference AAECC-4*, Karlsruhe, FRG, September 1986, published in *Lecture Notes in Computer Science*, Vol. 307, pp. 58-67, Springer-Verlag, April-May 1988.
103. Incorrect decoding and non detection probabilities for Reed-Solomon codes, (coauthors: F.J. Garcia-Ugalde, I. Magana-Mendoza), *Conferencia de la Academia Nacional de Ingenieria*, September 1985, San Luis Potosi, Mexico, pp. 267-271.

Patents

1. *Universal platform for software defined radio*, (coauthors: R. Kohno, M. Abe, N. Sasho, S. Haruyama, F. Swarts, P. Van Rooyen, Y. Sanada, L. Michael, H. Amir-Alikhani and V. Brankovic), European patent EP1224742, May 18, 2011.
2. *Method and Apparatus for Loss Correction and Limited Reception in Streaming Data, and Data Communication Apparatus*, (coauthor: M. Mihajevic), Japanese patent JP3918578, May 23, 2007.
3. *System for Transmitting Encoded Signals Using Multiple Block Lengths*, (coauthor: F. Swarts), U.S. patent No. 7,003,042, February 21, 2006.
4. *Transmitter, The Method of the Same and Communication System*, (coauthor: M. Ghavami), U.S. patent No. 7,065,149, June 20, 2006.
5. *Integrated Circuit, Method of Circuit Configuration and Program Thereof*, (coauthors: R. Kohno, K. Akai, M. Lachlan and Y. Sanada), U.S. patent No. 6,768,337, July 27, 2004.
6. *Universal Platform for Software Defined Radio*, (coauthors: R. Kohno et al.), U.S. patent No. 6,823,181, November 23, 2004.
7. *Hybrid State Machine for Frame Synchronization*, (coauthors: R. Juluri and C. Xiao), U.S. patent No. 6,741,613, May 25, 2004.
8. *Modulation format identification device and method of same*, U.S. patent No. 6,804,309, October 12, 2004.
9. *Decoder for Iterative Decoding of Binary Cyclic Codes*, U.S. patent No. 6,751,770, June 15, 2004.
10. *Method and apparatus for multi-level coding of digital signals*, (coauthors: S. Lin and M.P.C. Fossorier), U.S. Patent No. 6,643,332, Nov. 2003.
11. *Reed-Solomon decoder*, U.S. Patent No. 6,487,692, Nov. 26, 2002.
12. *System for improving the performance at low signal-to-noise ratios of receivers with Viterbi decoders*, (coauthor: A. Mogre), U.S. Patent No. 6,141,391, Oct. 31, 2000.
13. *Decoding trellis coded modulated data with a conventional Viterbi decoder*, (coauthors: A. Mogre, C. Qiang and R. Juluri), U.S. Patent No. 6,138,265, Oct. 24, 2000.
14. *Encoding and decoding rate-1/n convolutional codes and their punctured versions*, (coauthor: A. Mogre), U.S. Patent No. 6,134,696, Oct. 17, 2000.
15. *Method for choosing coding schemes, mappings, and puncturing rates for modulations/encoding systems*, (coauthor: A. Mogre), U.S. Patent No. 6,101,626, Aug. 8, 2000.
16. *Method and apparatus for fast decoding of a Reed-Solomon code*, U.S. Patent No. 6,081,920, June 27, 2000.