ENDER AYANOGLU

CURRENT POSITION

Professor

ELECTRONIC MAIL

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ADDRESS AND PHONE NUMBER

Engineering Hall 4221, UC Irvine, CA 92697-2625. (949) 824-1341

EDUCATION

Ph.D. 1986, Stanford University
M.S. 1982, Stanford University
B.S. 1980, Middle East Technical University

PROFESSIONAL INTERESTS

Communication Theory, Communication Systems, Communication Networks

ACADEMIC APPOINTMENTS

Co-Director, UCI Graduate Program in Networked Systems, July 2023-Present
Associate Chair, UCI Department of EECS, July 2020-June 2021
Director, UCI Graduate Program in Networked Systems, July 2017-June 2019
Associate Chair, UCI Department of EECS, November 2013-November 2016
Co-Director, UCI Graduate Program in Networked Systems, July 2012-June 2013
Director, UCI Center for Pervasive Communications and Computing, January 2003-April 2010
Conexant-Broadcom Endowed Chair, January 2003-April 2010
Interim Director, UCI Center for Pervasive Communications, September 2002-December 2002
Professor, UCI EECS, July 2002-Present
Visiting Professor, Bilkent University, November 1992-December 1992
Visiting Professor, Bilkent University, September 1990-June 1991
Teaching Fellow, Stanford University, April 1985-June 1985

AWARDS, HONORS, AND BIOGRAPHICAL LISTINGS

IEEE Communications Society Distinguished Lecturer, 2022-2023
IEEE Comm. Society Communication Theory Technical Committee Outstanding Service Award, 2014.
IEEE Fellow, 1998
IEEE Communications Society Best Tutorial Paper Award, 1997
IEEE Communications Society Stephen O. Rice Best Original Paper Award, 1995
NATO Science Fellow (1981-1984)
Fulbright Scholar, 1980 (Declined)

PROFESSIONAL ASSOCIATION MEMBERSHIPS

IEEE Communications Society
IEEE Information Theory Society

PROFESSIONAL SERVICE AND ACTIVITIES

1. Chair, Search for the Steering Committee Chair, *IEEE Networking Letters*, June 2021.

2. Member, Steering Committee, *IEEE Networking Letters,* June 2021-Present.

3. Member, Steering Committee, *IEEE Transactions on Green Communications and Networking,* August 2020-Present.

4. Co-Chair, *IEEE Communications Society Technical Committee on Green Communications and Computing Seminar Series: AI for Green 6G,* Virtual Seminar, 2020.

5. Guest Editor, *IEEE Internet of Things Journal, Special Issue on IoT on the Move: Enabling Technologies and Driving Applications for Internet of Intelligent Vehicles (IoIV),* February 2019.

6. Technical Program Committee Co-Chair, *Signal Processing for Intelligent Vehicular Communications Symposium* and *Green Communications and Networking Symposium; IEEE Global Signal and Information Processing Conference (GlobalSIP),* Anaheim, CA, 2018.

7. Co-Editor, *Best Readings in Green Communications,* October 2018. [Online.] Available: http://www.comsoc.org/publications/best-readings/green-communications

8. Technical Program Committee Co-Chair, Communication Theory Symposium, *IEEE International Conference on Communications (ICC) 2017*, Paris, France.

9. Founding Editor-in-Chief, *IEEE Transactions on Green Communications and Networking*, June 2016-August 2020.

10. Editor-in-Chief, *IEEE Journal on Selected Areas in Communications – Series on Green Communications and Networking,* January 2015-December 2016.

11. Member, Best Paper Awards Committee, *IEEE ICC,* 2016.

12. Member, Best Paper Awards Committee, *International Conference on Computing, Networking, and Communications (ICNC),* 2015, 2016.

13. Panel Co-Organizer and Co-Moderator, *IEEE Communication Theory Workshop 2015*.

14. Reviewer, *CINECA Consortium,* Italy; Italian Evaluation of Research Quality (Reviewed 5 research activities in 2012-2013).

15. Reviewer for *Funded Research, AAAS Research Competitiveness Program* (2 times during 2009-2010 and 2 times during 2012-2013).

16. Senior Editor, *IEEE Transactions on Communications*, December 2012-Present.

17. Co-Chair, Technical Program Committee, *IEEE ICC 2006 Communication Theory Symposium.*

18. Member, Awards Committee, *IEEE Communications Society Communication Theory Technical Committee,* November 2005-2010.

19. Editor-in-Chief, *IEEE Transactions on Communications,* January 2004-December 2007.

20. Editor (Communication Theory and Coding Applications), *IEEE Transactions on Communications,* January 1993-November 2012.

21. Editor, *Elsevier Computer Networks Journal*, January 2000-December 2001.

22. Guest Editor, *IEEE Journal on Selected Areas in Communications, Special Issue on Multi-Media Network Radios,* May 1999.

23. Chair, *IEEE Communications Society Communication Theory Technical Committee,* January 1999-December 2001.

24. Vice Chair, *IEEE Communications Society Communication Theory Technical Committee,* January 1996-December 1998.

25. Secretary, *IEEE Communications Society Communication Theory Technical Committee,* January 1990-December 1995.

26. Chair, *IEEE ISTO (Industry Standards and Technology Organization) Broadband Wireless Internet Forum* (and its *VOFDM Technology Task Group*), August 2000-December 2001.

27. Member, Executive Committee, *IEEE INFOCOM 1994.*

28. Member, Technical Program Committee, *IEEE INFOCOM 1990-1998, IEEE ICUPC 1997, ICT 1996-1998, IEEE GLOBECOM 1989-1990, 1999, IEEE VTC 1999, IEEE VTC Fall 1999, IEEE GLOBECOM 2007 Wireless Communications Symposium, IEEE WCNC 2010 Physical Layer Track, IEEE PIMRC 2011 Wide Area Cellular Communications Track, IEEE ICC 2011 Next Generation Networking Infrastructure Symposium, ICT 2016, IEEE WCNC 2015, 2016, IEEE SustainCom 2016, IEEE GLOBECOM 2023 Special Areas in Communications - Machine Learning for Communications Symposium.*

29. Co-organizer, *Calit2 Irvine Division Workshop on Biological and Computing/Communication Systems, 2010.*

30. Session Chair, *IEEE INFOCOM 1994-1995, IEEE GLOBECOM 1995, IEEE ATM Workshop 1995, IEEE ICC 1996, IEEE GLOBECOM 2005, IEEE ICC 2010, ITA 2016.*

31. Panelist, NSF Proposal, CAREER, IGERT Pre-Proposal Panels, Committee of Visitors, NSF CISE and Engineering Directorates (20 times during 1997, 2003-2023).

32. Panelist, NSF Workshop on Wireless and Mobile Communications and Networking, 1997.

33. Reviewer, UC MICRO Proposals (2003, 2007).

34. Reviewer for *IEEE Transactions on Communications, IEEE Transactions on Wireless Communications, IEEE Transactions on Information Theory, IEEE Transactions on Signal Processing, IEEE/ACM Transactions on Networking* and other major journals and conferences in communications, information theory, signal processing, and networking.

PH.D. ADVISEES

GRADUATES

1. Yue Zhao, *Parameter Analysis on Variants of Kernel Regression over Graphs, February 2023.*

2. Sadjad Sedighi, *Bit-Interleaved Coded Multiple Beamforming in Millimeter-Wave Massive MIMO Systems,* June 2021.

3. Nader Beigiparast, *Effect of Spatial Correlation in Massive MIMO Transmission,* January 2020.

4. Cemil Can Coskun, *Energy and Spectral Efficiency in Wireless Heterogeneous Networks,* June 2017.

5. Kemal Davaslioglu, Energy *Efficiency and Load Balancing in Next-Generation Wireless Cellular Networks,* December 2015.

6. Serhat Nazim Avci, Optimal *Near-Hitless Network Failure Recovery Using Diversity Coding,* Ph.D. December 2013.

7. Boyu Li, *Full Diversity Full Multiplexing Beamforming Techniques for Multiple-Input Multiple-Output Wireless Communication Systems,* December 2012.

8. Hong Ju Park, *An Analysis of MIMO Channel Eigenvalues with Applications to Multiple Beamforming,* December 2009.

9. Luay Azzam, *Reduction of Decoding Complexity for MIMO Sphere Decoding, QOSTBC, and OSTBC Systems,* June 2008.

10. Feyza Keceli, *Fair and Efficient Access Provisioning in Wireless Local Area Networks,* June 2008.

11. Inanc Inan, *Quality-of-Service (QoS) Provisioning in Wireless Local Area Networks,* September 2007.

12. Ersin Sengul, Beamforming *Techniques for MIMO Wireless Systems,* June 2007.

13. Enis Akay, *Multi-Input Multi-Output Wireless Systems with Maximum Diversity and Spatial Multiplexing,* June 2006.

14. Nihat Cem Oguz, *Two-Level Forward Error Correction for Lost Cell Recovery in ATM Networks,* July 1995.

CURRENT STUDENTS

1. Dogan Kutay Pekcan

M.S. ADVISEES

GRADUATES

1. Wenyu Zhu, *Performance Comparison of Three Channel Charting Algorithms with Three Dimensionality Reduction Techniques in Quadriga Channels,* June 2022.

2. Yue Zhao, *Performance of Reduced Rank Adaptive Estimation for Joint Spatial Division and Multiplexing,* March 2019.

3. Jyotica Yadav, *Traffic Offloading in HetNets Using Power Biasing Considering Different Path Loss Exponent,* January 2019.

4. Nader Beigiparast, *Millimeter Waves in Single-Carrier Massive MIMO Transmissions,* January 2017.

5. Sadjad Sedighi, *Channel Estimation Methods by Using Prebeamforming Technique in Massive MIMO,* January 2017.

6. Ecehan Uludag, *Constant-Envelope OFDM and Constant-Envelope SC-FDMA,* June 2016.

7. Nistha Tandiya, *Constant-Envelope Modulation Schemes with Turbo Coding,* June 2015.

8. Nannan Li, *User Equipment Throughput and Fairness Comparison for Frequency Division Duplex and Time Division Duplex LTE Networks,* December 2013.

9. Serhat Nazim Avci, *Coding Based Link Failure Recovery Applications,* December 2011.

10. Xiaoyu Sun, Loss *Recovery via Erasure Coding in Packet Networks,* June 2010.

11. Wenjun Zhao, Diversity and Error Path Analysis for Bit-Interleaved Coded Multiple Beamforming Systems, June 2009.

12. Kayla Nguyen, *Reduction of Computational Complexity for the Decoding of M x N Orthogonal and Quasi-Orthogonal Space-Time Block Codes,* June 2008.

13. Shraboni Jana, *Limited Feedback for MIMO Systems,* March 2007.

14. Konstantinos Aretos, *Low Density Parity Check Codes for OFDM-SVD-MIMO Systems,* December 2006.

15. Yuan-Ning Hsu, Low *Density Parity Check Codes for 802.11 Wireless LAN,* December 2004.

16. Ercan Engin Kuruoglu, *The Design of Finite-State Machines for Quantization Using Simulated Annealing,* August 1993.

CURRENT STUDENTS

1. Gal Ben Itzhak

REFEREED JOURNAL ARTICLES

J65. K. Davaslioglu, S. Boztas, M. C. Ertem, Y. E. Sagduyu and E. Ayanoglu, "Self-Supervised RF Signal Representation Learning for NextG Signal Classification With Deep Learning," *IEEE Wireless Communications,* Letters, Vol. 12, pp. 65-69, January 2023.

J64. E. Ayanoglu, F. Capolino and A. L. Swindlehurst, "Wave-Controlled Metasurface-Based Reconfigurable Intelligent Surfaces," *IEEE Wireless Communications,* Vol. 29, pp. 86-92, August 2022.

J63. Y. Zhao and E. Ayanoglu, "Gaussian Kernel Variance for an Adaptive Learning Method on Signals Over Graphs," *IEEE Signal and Information Processing over Networks,* Vol. 8, pp. 389-403, 2022.

J62. E. Ayanoglu, K. Davaslioglu, and Y. Sagduyu, "Machine Learning in NextG Networks via Generative Adversarial Networks," *IEEE Transactions on Cognitive Communications and Networking,* Vol. 8, pp. 480-501, June 2022.

J61. T. Ketseoglou, M. Valenti, and E. Ayanoglu, "Millimeter Wave Massive MIMO Downlink Per-Group Communications with Hybrid Linear Precoding," *IEEE Transactions on Vehicular Technology* Vol. 70, pp. 6841-6854, July 2021.

J60. S. Sedighi and E. Ayanoglu, "Bit-Interleaved Coded Multiple Beamforming with Perfect Coding in Millimeter-Wave MIMO Systems," *IEEE Wireless Communications Letters,* Vol. 10, pp. 644-648, March 2021.

J59. S. Sedighi and E. Ayanoglu, "Bit-Interleaved Coded Multiple Beamforming in Millimeter-Wave Massive MIMO Systems," *IEEE Transactions on Communications,* Vol. 68, pp. 6174-6185, October 2020.

J58. S. Zhang, S. Xu, G. Y. Li, and E. Ayanoglu, "First 20 Years of Green Radios," *IEEE Transactions on Green Communications and Networking,* Vol. 4, pp. 1-15, March 2020.

J57. T. Ketseoglou and E. Ayanoglu, "Zero-Forcing Per-Group Precoding (ZF-PGP) for Robust Optimized Downlink Massive MIMO Performance," *IEEE Transactions on Communications,* Vol. 67, pp. 6816-6828, October 2019.

J56. M. L. Tran, S. Kim, T. Ketseoglou, and E. Ayanoglu, "LED Selection and MAP Detection for Generalized LED Index Modulation," *IEEE Photonics Technology Letters,* Vol. 30, pp. 1695-1698, October 2018.

J55. T. Ketseoglou and E. Ayanoglu, "Downlink Precoding for Massive MIMO Systems Exploiting Virtual Channel Sparsity," *IEEE Transactions on Communications,* Vol. 66, pp. 1925-1939, May 2018.

J54. C. C. Coskun and E. Ayanoglu, "Energy- and Spectral-Efficient Resource Allocation Algorithm for Heterogeneous Networks," *IEEE Transactions on Vehicular Technology,* Vol. 67, pp. 590-603, January 2018.

J53. C. C. Coskun, K. Davaslioglu, and E. Ayanoglu, "Three-Stage Resource Allocation for Energy-Efficient Heterogeneous Networks," *IEEE Transactions on Vehicular Technology,* Vol. 66, pp. 6942-6957, August 2017.

J52. T. Ketseoglou and E. Ayanoglu, "Linear Precoding Gain for Large MIMO Configurations with QAM and Reduced Complexity," *IEEE Transactions on Communications,* Vol. 64, pp. 4196-4208, October 2016.

J51. K. Davaslioglu, C. C. Coskun, and E. Ayanoglu, "Energy-Efficient Resource Allocation for Fractional Frequency Reuse in Heterogeneous Networks," *IEEE Transactions on Wireless Communications,* Vol. 14, pp. 5484-5497, October 2015.

J50. F. Keceli, I. Inan, and E. Ayanoglu, "Fair and Efficient TCP Access in the IEEE 802.11 Infrastructure Basic Service Set," *Wiley Wireless Communications and Mobile Computing Journal,* Vol. 15, pp. 1376-1390, June 2015.

J49. S. N. Avci and E. Ayanoglu, "Link Failure Recovery over Large Arbitrary Networks: The Case of Coding," *IEEE Transactions on Communications,* Vol. 63, pp. 1726-1740, May 2015.

J48. T. Ketseoglou and E. Ayanoglu, "Linear Precoding for MIMO with LDPC Coding and Reduced Complexity," *IEEE Transactions on Wireless Communications,* Vol. 14, pp. 2192-2204, April 2015.

J47. K. Davaslioglu and E. Ayanoglu, "Quantifying Potential Energy Efficiency Gain in Green Cellular Wireless Networks," *IEEE Communications Surveys and Tutorials,* Vol. 16, pp. 2065-2091, Fourth Quarter 2014.

J46. C. C. Coskun and E. Ayanoglu, "Energy-Efficient Base Station Deployment in Heterogeneous Networks,"*IEEE Wireless Communications Letters,* Vol. 3, pp. 593-596, December 2014.

J45. A. L. Swindlehurst, E. Ayanoglu, P. Heydari, and F. Capolino, "Millimeter-Wave Massive MIMO: The Next Wireless Revolution?," *IEEE Communications Magazine,* Vol. 52, pp. 56-62, September 2014.

J44. K. Davaslioglu and E. Ayanoglu, "Efficiency and Fairness Tradeoffs in SC-FDMA Schedulers," *IEEE Transactions on Wireless Communications,* Vol. 13, pp. 2991-3002, June 2014.

J43. S. N. Avci and E. Ayanoglu , "Coded Path Protection: Efficient Conversion of Sharing to Coding," *IEEE Transactions on Communications,* Vol. 61, pp. 4294-4309, October 2013.

J42. B. Li and E. Ayanoglu, "Diversity Analysis of Bit-Interleaved Coded Multiple Beamforming with Orthogonal Frequency Division Multiplexing," *IEEE Transactions on Communications,* Vol. 61, pp. 3794-3805, September 2013.

J41. S. N. Avci and E. Ayanoglu, "Optimal Algorithms for Near-Hitless Network Restoration via Diversity Coding," *IEEE Transactions on Communications*, Vol. 61, pp. 3878-3893, September 2013.

J40. B. Li and E. Ayanoglu, "Full-Diversity Precoding Design of Bit-Interleaved Coded Multiple Beamforming with Orthogonal Frequency Division Multiplexing," *IEEE Transactions on Communications,* Vol. 61, pp. 2432-2445, June 2013.

J39. B. Li and E. Ayanoglu, "Multiple Beamforming with Perfect Coding," *IEEE Transactions on Communications,* Vol. 60, pp. 1575-1586, June 2012.

J38. B. Li and E. Ayanoglu, "Reduced Complexity Sphere Decoding," *Wiley Wireless Communications and Mobile Computing Journal,* Vol. 11, pp. 1518-1527, December 2011. (Invited Paper)

J37. H. J. Park, B. Li, and E. Ayanoglu, "Constellation Precoded Multiple Beamforming," *IEEE Transactions on Communications,* Vol. 59, pp. 1275-1286, May 2011.

J36. E. Ayanoglu, E. G. Larsson, and E. Karipidis, "Computational Complexity of Decoding Orthogonal Space-Time Block Codes," *IEEE Transactions on Communications,* Vol. 59, pp. 936-941, April 2011.

J35. H. J. Park and E. Ayanoglu, "Diversity Analysis of Bit-Interleaved Coded Multiple Beamforming," *IEEE Transactions on Communications,* Vol. 58, pp. 2457-2463, August 2010.

J34. I. Inan, F. Keceli, and E. Ayanoglu, "A Capacity Analysis Framework for the IEEE 802.11e Contention-based Infrastructure Basic Service Set," *IEEE Transactions on Communications,* Vol. 57, pp. 3433-3445, November 2009.

J33. L. Azzam and E. Ayanoglu, "Reduced Complexity Sphere Decoding via a Reordered Lattice Representation," *IEEE Transactions on Communications,* Vol. 57, pp. 2564-2569, September 2009.

J32. L. Azzam and E. Ayanoglu, "Real-Valued Maximum Likelihood Decoder for Quasi-Orthogonal Space-Time Block-Codes," *IEEE Transactions on Communications,* Vol. 57, pp. 2260-2263, August 2009.

J31. I. Inan, F. Keceli, and E. Ayanoglu, "Analysis of the 802.11e Enhanced Distributed Channel Access Function," *IEEE Transactions on Communications,* Vol. 57, pp. 1753-1764, June 2009.

J30. E. Sengul, H. J. Park, and E. Ayanoglu, "Bit-Interleaved Coded Multiple Beamforming with Imperfect CSIT," *IEEE Transactions on Communications,* Vol. 57, pp. 1505-1513, May 2009.

J29. L. Azzam and E. Ayanoglu, "A Novel Maximum Likelihood Decoding Algorithm for Orthogonal Space-Time Block Codes," *IEEE Transactions on Communications,* Vol. 57, pp. 606-609, March 2009.

J28. E. Akay, E. Sengul, and E. Ayanoglu, "Bit Interleaved Coded Multiple Beamforming," *IEEE Transactions on Communications,* Vol. 55, pp. 1802-1811, September 2007.

J27. E. Akay and E. Ayanoglu, "Achieving Full Frequency and Space Diversity in Wireless Systems via BICM, OFDM, STBC, and Viterbi Decoding," *IEEE Transactions on Communications,* Vol. 54, pp. 2164-2172, December 2006.

J26. B. A. Cetiner, E. Sengul, E. Akay, and E. Ayanoglu, "A MIMO System with Multifunctional Reconfigurable Antennas," *IEEE Antennas and Wireless Propagation Letters,* Vol. 5, pp. 463-466, December 2006.

J25. E. Sengul, E. Akay, and E. Ayanoglu, "Diversity Analysis of Single and Multiple Beamforming," *IEEE Transactions on Communications,* Vol. 54, pp. 990-993, June 2006.

J24. M. Alanyali and E. Ayanoglu, "A Provisioning Algorithm for WDM Optical Networks," *IEEE/ACM Transactions on Networking,* Vol. 7, pp. 767-778, October 1999.

J23. E. Ayanoglu, "Wireless Broadband and ATM Systems," *Computer Networks and ISDN Systems Journal,* Vol. 31, pp. 395-410, February 1999. (Invited Paper)

J22. E. Karasan and E. Ayanoglu, "Performance of WDM Transport Networks," *IEEE Journal on Special Areas in Communication*s, Vol. 16, pp. 1081-1096, September 1998.

J21. E. Ayanoglu, N. R. Dagdeviren, G. D. Golden, and J. E. Mazo, "An Equalizer Design Technique for the PCM Modem: A New Modem for the Digital Public Switched Telephone Network," *IEEE Transactions on Communications,* Vol. 46, pp. 763-774, June 1998.

J20. E. Karasan and E. Ayanoglu, "Effects of Wavelength Routing and Selection Algorithms on Wavelength Conversion Gain in WDM Optical Networks," *IEEE/ACM Transactions on Networking,* Vol. 6, pp. 186-196, April 1998.

J19. E. Ayanoglu, "Data Transmission When the Sampling Frequency Exceeds the Nyquist Rate," *IEEE Communications Letters,* Vol. 1, pp. 157-159, November 1997.

J18. E. Ayanoglu, P. Pancha, A. Reibman, and S. Talwar, "Forward Error Control for MPEG-2 Video Transport in a Wireless LAN," *ACM/Baltzer Mobile Networks and Applications Journal,* Vol. 1, pp. 235-244, December 1996.

J17. E. Ayanoglu, K. Y. Eng, M. J. Karol, Z. Liu, P. Pancha, M. Veeraraghavan, and C. B. Woodworth, "Mobile Information Infrastructure," *Bell Labs Technical Journal,* Vol. 1, pp. 143-164, November 1996.

J16. E. Ayanoglu, K. Y. Eng, and M. J. Karol, "Wireless ATM: Limits, Challenges, and Proposals," *IEEE Personal Communications Magazine,* Vol. 3, pp. 18-34, August 1996. **IEEE Communications Society 1997 Best Tutorial Paper Award** (for the best tutorial paper published in IEEE Communications Society publications in 1996). (Invited Paper)

J15. E. Ayanoglu and R. D. Gitlin, "Broadband Network Restoration," *IEEE Communications Magazine,* Vol. 34, pp. 110-119, July 1996.

J14. K. Y. Eng, M. Karol, M. Veeraraghavan, E. Ayanoglu, C. Woodworth, and R. A. Valenzuela, "A Wireless Broadband Ad-Hoc ATM Local-Area Network," *ACM/Baltzer Wireless Networks Journal,* Vol. 1, pp. 161-174, May 1995.

J13. E. Ayanoglu, S. Paul, T. F. La Porta, K. K. Sabnani, and R. D. Gitlin, "AIRMAIL: A Link-Layer Protocol for Wireless Networks," *ACM/Baltzer Wireless Networks Journal,* Vol. 1, pp. 47-60, February 1995.

J12. T. F. LaPorta, M. Veeraraghavan, E. Ayanoglu, M. Karol, and R.D. Gitlin, "Broadband Integrated Services Digital Networks: A Technological Discontinuity," *IEEE Communications Magazine,* Vol. 32, pp. 84-97, October 1994.

J11. E. Ayanoglu, C.-L. I, R. D. Gitlin, and I. Bar-David, "Analog Diversity Coding to Provide Transparent Self-Healing Communication Networks," *IEEE Transactions on Communications,* Vol. COM-42, pp. 110-118, January 1994. **IEEE Communications Society 1995 Stephen O. Rice Prize Paper Award** (for the best original paper published in *IEEE Transactions on Communications* in 1994).

J10. E. Ayanoglu, C.-L. I, R. D. Gitlin, and J. E. Mazo, "Diversity Coding for Self-Healing and Fault-Tolerant Communication Networks," *IEEE Transactions on Communications,* Vol. COM-41, pp. 1677-1686, November 1993.

J9. E. Ayanoglu, R. D. Gitlin, and N. C. Oguz, "Performance Improvement in Broadband Networks Using Forward Error Correction for Lost Packet Recovery," *Journal of High-Speed Networks,* Vol. 2, pp. 287-304, 1993.

J8. E. Ayanoglu and R. J. Caballero, "Path Enumeration and Hot-Potato Routeing Analysis in Multihop Networks," *International Journal of Digital and Analog Communication Systems,* Vol. 5, pp. 217-223, November 1992.

J7. E. Ayanoglu, "Robust and Fast Failure Detection and Prediction for Fault-Tolerant Communication Network," *Electronics Letters,* Vol. 28, pp. 940-941, May 1992.

J6. E. Ayanoglu and R.D. Gitlin, "Tandem Transcoding Without Distortion Accumulation for Vector Quantization," *IEEE Transactions on Communications,* Vol. COM-40, pp. 397-403, February 1992.

J5. J. H. Winters, E. Ayanoglu, I. Bar-David, R. D. Gitlin, and C.-L. I, "Ghost Cancellation of Analog TV Signals with Applications to IDTV, EDTV, and HDTV," *IEEE Transactions on Circuits and Systems for Video Technology,* Vol. CSVT-1, pp. 136-146, March 1991.

J4. E. Ayanoglu, "On Optimal Quantization of Noisy Sources," *IEEE Transactions on Information Theory,* Vol. IT-36, pp. 1450-1452, November 1990.

J3. J.-D. Wang and E. Ayanoglu, "Priority Statistical Multiplexer Design for SNA/SDLC Access to a Virtual Circuit Packet Network," *AT&T Technical Journal,* Vol. 67, pp. 69-86, November 1988.

J2. E. Ayanoglu and R. M. Gray, "The Design of Joint Source and Channel Trellis Waveform Coders," *IEEE Transactions on Information Theory,* Vol. IT-33, pp. 855-865, November 1987.

J1. E. Ayanoglu and R. M. Gray, "The Design of Predictive Trellis Waveform Coders Using the Generalized Lloyd Algorithm," *IEEE Transactions on Communications,* Vol. COM-34, pp. 1073-1080, November 1986.

BOOK CHAPTERS AND ARTICLES

B6. E. Ayanoglu and N. Akar, "B-ISDN (Broadband Integrated Services Digital Network)," Wi*ley Encyclopedia of Telecommunications,* J. Proakis (Ed.), Wiley, December 2002. (Invited Contribution)

B5. E. Ayanoglu, K. Y. Eng, and M. J. Karol, `Limits and Challenges for Wireless ATM," *Mobile Multimedia Communications,* D. J. Goodman and D. Raychaudhuri (Eds), Plenum Press, New York, 1997.

B4. E. Ayanoglu, "Wireless Packet and Wireless ATM Systems," *Wireless Communications, TDMA versus CDMA,* S. G. Glisic and P. A. Leppanen (Eds), Kluwer Academic Publishers, Dordrecht, The Netherlands, 1997.

B3. E. Ayanoglu, P. Pancha, A. Reibman, and S. Talwar, "Combined Source and Channel Coding for Wireless ATM LANs," *Signal Processing in Telecommunications,* E. Biglieri and M. Luise (Eds), Springer, London, 1996.

B2. E. Ayanoglu, "Signal Flow Graphs for Path Enumeration and Deflection Routing Analysis in Multihop Networks," in Performance Evaluation of High-Speed Switching Fabrics and Networks: ATM, Broadband ISDN, and MAN Technology, T. Robertazzi (Ed.), IEEE Press, Piscataway, New Jersey, 1993.

B1. E. E. Kuruoglu and E. Ayanoglu, "The Design of Finite-State Machines for Quantization Using Simulated Annealing," in *Coding and Quantization: DIMACS/IEEE Workshop Proceedings,* October 19-21, 1992, R. Calderbank, D. G. Forney, Jr., N. Moayeri (Eds.), American Mathematical Society, Providence, RI, 1993.

CRITICALLY AND ANONYMOUSLY REFEREED ARCHIVAL CONFERENCE PAPERS

C97. A. Aly and E. Ayanoglu, "Channel Charting: Model-Based Approaches," *IEEE International Conference on Communicatoins, (ICC)*, pp. 1066-1072, Rome, Italy, June 2023.

C96. A. Aly and E. Ayanoglu, "Estimation of User Coordinates via Channel Charting and MUSIC," *2023 International Conference on Computing, Networking and Communications (ICNC)*, pp. 343-347, Honolulu, HI, Feb. 2023.

C95. N. Beigiparast and E. Ayanoglu, "Precoders and Equalizers for Spatially Correlated Antennas in Single-Carrier Massive MIMO Transmission," *2020 International Conference on Computing, Networking and Communications (ICNC)*, pp. 35-40, Hawaii, HI, Feb. 2020.

C94. T. Ketseoglou, M. C. Valenti and E. Ayanoglu, "Millimeter Wave Massive MIMO Downlink Per-Group Communications with Hybrid Linear Precoding," *53rd Asilomar Conference on Signals, Systems, and Computers*, Asilomar Grounds, CA, pp. 973-977, Nov. 2019.

C93. S. Sedighi and E. Ayanoglu, "Bit-Interleaved Coded Multiple Beamforming in Millimeter-Wave Massive MIMO Systems," *IEEE International Conference on Communications (ICC)*, Shanghai, China, pp. 1-6, May 2019.

C92. T. Ketseoglou and E. Ayanoglu, "Downlink Precoding for Massive MIMO Systems Exploiting Virtual Channel Model Sparsity," *2018 IEEE International Conference on Communications (ICC)*, pp. 1-6, Kansas City, MO, May 2018.

C91. N. Beigiparast, G. M. Guvensen and E. Ayanoglu, "The Effect of Antenna Correlation in Single-Carrier Massive MIMO Transmission," *2018 IEEE 87th Vehicular Technology Conference (VTC Spring)*, pp. 1-7, Porto, Portugal, May 2018.

C90. C. C. Coskun and E. Ayanoglu, "Energy-Spectral Efficiency Tradeoff for Heterogeneous Networks with QoS Constraints," *Proc. IEEE ICC 2017,* pp. 1-7, Paris, France, May 2017.

C89. G. M. Guvensen and E. Ayanoglu, "Beamspace Aware Adaptive Channel Estimation for Single-Carrier Time-varying Massive MIMO Channels," *Proc. IEEE ICC 2017,* pp. 1-7, Paris, France, May 2017.

C88. G. M. Guvensen and E. Ayanoglu, "A Generalized Framework on Beamformer Design and CSI Acquisition for Single-Carrier Massive MIMO Systems in Millimeter Wave Channels," *Proc. IEEE GLOBECOM 2016 Workshops Emerging Technologies for 5G Wireless Cellular Networks,* pp. 1-7, Washington, DC, December 2016.

C87. T. Ketseoglou and E. Ayanoglu, "Linear Precoding Gain for Large MIMO Configurations and Reduced Complexity," *Proc. IEEE GLOBECOM 2016,* pp. 1-7, Washington, D.C., December 2016.

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R8. L. Azzam and E. Ayanoglu, "Reduction of ML Decoding Complexity for MIMO Sphere Decoding, QOSTBC, and OSTBC," *Proc. Information Theory and Applications Workshop (ITA),* La Jolla, CA, January 2008. **Invited Presentation**

R7. E. Akay, E. Sengul, and E. Ayanoglu, "MIMO BICM-OFDM Beamforming with Full and Partial CSIT," *Proc. Information Theory and Applications Workshop (ITA),* La Jolla, CA, January 2007. **Invited Presentation**

R6. E. Akay, E. Sengul, and E. Ayanoglu, "Performance of MIMO Techniques to Achieve Full Diversity and Maximum Spatial Multiplexing," *Proc. UCSD Information Theory and Applications Workshop (ITA)*, La Jolla, CA, February 2006. **Invited Presentation**

R5. E. Ayanoglu, B. L. Douglas, O. Gurbuz, E. Perahia, and K. Toussi, "BWIF - Bringing Broadband Wireless Access Indoors, " *IEEE-ISTO Broadband Wireless Internet Forum White Paper,* Document WP-4/TG-1, September 2001.

R4.   E. Ayanoglu, M. Burgess, M. Pollack, and A. Zamanian, "Frequency Division Duplexing and Time Division Duplexing for Broadband Wireless Applications," *IEEE-ISTO Broadband Wireless Internet Forum White Paper,* Document WP-3/TG-1, February 2001.

R3.   E. Ayanoglu, VK Jones, G. G. Raleigh, J. Gardner, D. Gerlach, and K. Toussi, "VOFDM Broadband Wireless Transmission and Its Advantages over Single Carrier Modulation," *IEEE-ISTO Broadband Wireless Internet Forum White Paper,* Document WP-1/TG-1, December 2000.

R2.   E. Ayanoglu, "Media Access Protocols: Circuit Switching to DOCSIS," *IEEE-ISTO Broadband Wireless Internet Forum White Paper,* Document WP-2/TG-1, December 2000.

R1.   E. Ayanoglu, White Paper Contribution, *Research Priorities in Wireless and Mobile Communications and Networking,* J. Bannister and J. Modestino (Eds), Report of NSF Workshop Held March 24-26, 1997, Airlie House, VA.

PUBLIC LECTURES

L96. E. Ayanoglu, "Wave-Controlled Metasurface-Based Reconfigurable Intelligent Surfaces," National Science Foundation Spectrum and Wireless Innovation enabled by Future Technologies (SWIFT) Principal Investigator Meeting, Washington, D.C., April 2023. **Invited Presentation**

L95. E. Ayanoglu, "Generative Adversarial Networks for Spectrum Sharing," Information, Communication, Technology and Society Conference (ICTAS), Durban University of Technology, South Africa, March 2023. **Keynote Speaker**

L94. E. Ayanoglu, "Machine Learning in NextG Networks via Generative Adversarial Networks," International Conference on Computing, Networking, and Communications (ICNC), Honolulu, HI, Feb. 2023. **Invited Talk**

L93. D. K. Pekcan, E. Ayanoglu, and T. Ketseoglou, "Received Power Maximization with Reconfigurable Intelligent Surfaces," Information Theory and Applications Workshop, San Diego, CA, February 2023. **Invited Presentation**

L92. E. Ayanoglu, "Wave-Controlled Metasurface-Based Reconfigurable Intelligent Surfaces," IEEE Communications Society and Information Theory Society Joint Chapter, Finland, January 2023. **Virtual Distinguished Lecture**

L91. E. Ayanoglu, "Wave-Controlled Metasurface-Based Reconfigurable Intelligent Surfaces," IEEE Communications Society and Vehicular Technology Society Chapters, Portugal, January 2023. **Virtual Distinguished Lecture**

L90. E. Ayanoglu, "Energy- and Spectral-Efficient Resource Allocation Algorithm for Heterogeneous Networks," IEEE Communications Society and Vehicular Technology Society Chapters, Portugal, November 2022. **Virtual Distinguished Lecture**

L89. E. Ayanoglu, "Generative Adversarial Networks for Spectrum Sharing," IEEE Communications Chapter, Atlanta, GA, November 2022. **Virtual Distinguished Lecture**

L88. E. Ayanoglu, "Generative Adversarial Networks for Spectrum Sharing," Bilkent University Electrical and Electronics Engineering Distinguished Seminar Series, October 2022. **Distinguished Seminar**

L87. E. Ayanoglu, "What Should/Would/Will 6G Be (and What Not?)," IEEE Communications Society Communication Theory Technical Committee Workshop, October 2022. **Panelist**

L86. E. Ayanoglu, "Machine Learning in NextG Networks via Generative Adversarial Networks (GANs)," Information Theory and Applications Workshop, San Diego, CA, May 2022. **Invited Presentation**

L85. E. Ayanoglu, "Massive MIMO with Spatially Correlated Antennas," International Conference on Computing, Networking, and Communications (ICNC), Big Island, HI, Feb. 2020. **Invited Talk**

L84. E. Ayanoglu, "Energy and Spectral Efficiency in Next-Generation Cellular Networks," Tongji University, Shanghai, China, May 2019.

L83. E. Ayanoglu, "Energy and Spectral Efficiency in Next-Generation Cellular Networks," Fudan University, Shanghai, China, May 2019.

L82. G. Miao, Z. Niu, E. Ayanoglu, "Energy and Spectral Efficiency Tradeoffs in Future Communication Networks" International Conference on Communications (ICC), Shanghai, China, May 2019. **Tutorial**

L81. E. Ayanoglu, "Energy and Spectral Efficiency in Next-Generation Cellular Networks," UC Riverside ECE Department Seminar Series Seminar, Riverside, CA, Apr. 2019. **Distinguished Seminar Speaker**

L80. N. Beigiparast, R. M. Guvensen, E. Ayanoglu, "Performance of Single-Carrier Massive MIMO with Spatially Correlated Antennas," Information Theory and Applications Workshop, San Diego, CA, February 2019. **Invited Presentation**

L79. E. Ayanoglu, "Spatial Correlation in Single-Carrier Massive MIMO," International Conference on Computing, Networking, and Communications (ICNC), Honolulu, HI, Feb. 2019. **Invited Talk**

L78. E. Ayanoglu, "Why Energy Efficiency is Very Important and Its Relation with Spectral Efficiency in Next-Generation Wireless Networks," IEEE Green Energy and Small Systems Conference (IGESSC), Long Beach, CA, Oct. 2018. **Keynote Speaker**

L77. G. Miao, G. Li, and E. Ayanoglu, "Spectrum and Energy Efficiency in 5G Mobile Data Networks," International Conference on Communications (ICC), Kansas City, MO, May 2018. **Tutorial**

L76. E. Ayanoglu, "Energy-Spectral Efficiency Tradeoff for Heterogeneous Networks with QoS Constraints," International Conference on Computing, Networking, and Communications (ICNC), Maui, HI, March 2018. **Invited Talk**

L75. E. Ayanoglu, Emerging Wireless Technologies Panel, DASpedia Wireless with Woz Conference , Irvine, CA, Feb. 2018. **Invited Panelist**

L74. E. Ayanoglu, "Adaptive Channel Estimators with Hybrid Beamforming for Single-Carrier Massive MIMO" IEEE International Conference on Microwaves, Communications, Antennas, and Electronic Systems (IEEE COMCAS 2017), Tel Aviv, Israel, November 2017. **Invited Talk**

L73. E. Ayanoglu, "Next-Generation (5G) Cellular Wireless: What, Why, How, and When?" IEEE International Conference on Microwaves, Communications, Antennas, and Electronic Systems (IEEE COMCAS 2017), Tel Aviv, Israel, November 2017. **Plenary Speaker**

L72. E. Ayanoglu, "Fifth Generation Cellular Wireless: Goals, Schedules, and Implementation" Second Wireless Silk Road International Academic Symposium, Beijing Jiaotong University, Beijing, China, July 2017. **Keynote Speaker**

L71. E. Ayanoglu, "What is Achievable in Energy Efficiency for Cellular Wireless Communications?," Grande École d'Ingénieurs Généraliste Électronique, Informatique et Télécommunications (ENSEA), Cergy-Pontoise, France, May 2017.

L70. E. Ayanoglu, "What Can be Achieved in Energy Efficiency for Cellular Wireless Communications?," Laboratory of Information, Networking and Communication Sciences (LINCS), Paris, France, May 2017.

L69. E. Ayanoglu, "Energy-Spectral Efficiency Tradeoff for Heterogeneous Networks with QoS Constraints," IEEE International Conference on Communications (ICC), Paris, France, May 2017. **Invited Presentation**

L68. E. Ayanoglu, "Beamformer Design for Massive MIMO Systems in Millimeter-Wave Channels," International Conference on Computing, Networking, and Communications (ICNC), Santa Clara, CA, February 2017. **Invited Talk**

L67. E. Ayanoglu, "Fifth Generation (5G) Cellular Wireless: Vision, Goals, and Challenges ," International Performance Computing and Communications Conference, Las Vegas, NV, December 2016. **Keynote Speaker**

L66. E. Ayanoglu, "Introduction to Electrical Engineering and Computer Engineering: Communications and Digital Signal Processing," EECS1 Seminar, UC Irvine, CA, May 2016.

L65. E. Ayanoglu, "Green Cellular Communications: What Are the Potential Gains and How to Achieve Them?" Muroran Institute of Technology, Japan, March 2016. **Invited Presentation**

L64. E. Ayanoglu, "5G Today: Modulation Technique Alternatives," Muroran Institute of Technology, Japan, March 2016. **Invited Presentation**

L63. E. Ayanoglu, "Introduction to Electrical Engineering and Computer Engineering: Communications and Digital Signal Processing," EECS 1 Seminar, UC Irvine, CA, May 2015.

L62. E. Ayanoglu, "Green Cellular Communications: What Are the Potential Gains and How to Achieve Them?" International Conference on Sustainable Computing and Communications (SustainCom), Chengdu, China, December 2015. **Keynote Presentation**

L61. E. Ayanoglu, "Green Cellular Communications: What Are the Potential Gains and How to Achieve Them?," IEEE Wireless Communications and Networking Conference (WCNC), New Orleans, LA, March 2015. **Tutorial**

L60. E. Ayanoglu, "Green Cellular Communications: What Are the Potential Gains and How to Achieve Them?," International Conference on Computing, Networking, and Communications, (ICNC), Anaheim, CA, February 2015. **Distinguished Lecture**

L59. E. Ayanoglu, "Energy-Efficient Fractional Frequency Reuse Techniques for Cellular Wireless Systems," Information Theory and Applications Workshop, La Jolla, CA, February 2015. **Invited Presentation**

L58. E. Ayanoglu, "State and Future of Wireless Communications and Networking," UC Riverside Department of Electrical and Computer Engineering Seminar, Riverside, CA, November 2013. **Invited Talk**

L57. E. Ayanoglu, "State and Future of Wireless Communications and Networking," UCI EECS Colloquium, Irvine, CA, November 2012. **Invited Presentation**

L56. E. Ayanoglu, "State and Future of Wireless Communications and Networking," UCI EECS Colloquium, Irvine, CA, November 2011. **Invited Presentation**

L55. E. Ayanoglu, "State and Future of Wireless Communications and Networking," UCI EECS Colloquium, Irvine, CA, November 2010. **Invited Presentation**

L54. E. Ayanoglu, "State and Future of Wireless Communications and Networking," UCI EECS Colloquium, Irvine, CA, November 2009. **Invited Presentation**

L53. E. Ayanoglu, "Bit-Interleaved Coded Multiple Beamforming with Constellation Precoding," Department of Electrical Engineering Seminar, UC Riverside, Riverside, CA, October 2009. **Invited Talk**

L52. E. Ayanoglu, "Engineering Optimization and Nature," Calit2 Irvine Division Workshop on Biological and Computing/Communication Systems, Irvine, CA, July 2009.

L51. E. Ayanoglu, "Wireless Communications Research," Calit2 Irvine Division Wireless Workshop, Irvine, CA, March 2009.

L50. E. Ayanoglu, "State and Future of Wireless Communications and Networking," UCI EECS Colloquium, Irvine, CA, November 2008. **Invited Presentation**

L49. E. Ayanoglu, "Current State and Future of Communications and Networking," UCI EECS Colloquium, Irvine, CA, November 2007. **Invited Presentation**

L48. R. Halim, P. Voois, A. Dickinson, and E. Ayanoglu, "Semiconductors in High-Speed Communications," Southern California Summit on Semiconductors and Communications, Newport Beach, CA, June 2007. **Invited Panelist**

L47. E. Ayanoglu, "Bit-Interleaved Coded Multiple Beamforming to Achieve Full Diversity and Maximum Spatial Multiplexing," IEEE Radio and Wireless Symposium 2007, Long Beach, CA, January 2007. **Invited Talk**

L46. E. Ayanoglu, "Opportunities and Challenges in Communications over the Next Decade," UCI EECS Colloquium, Irvine, CA, November 2006. **Invited Presentation**

L45. E. Ayanoglu, "Opportunities and Challenges in Communications over the Next Decade," UCI EECS Colloquium, Irvine, CA, November 2005. **Invited Presentation**

L44. E. Ayanoglu, "Opportunities and Challenges in Communications over the Next Decade," UCI EECS Colloquium, Irvine, CA, November 2004. **Invited Presentation**

L43. E. Ayanoglu, "UCI Center for Pervasive Communications and Computing," Cal-$(IT)^2$ All Hands Meeting, La Jolla, CA, April 2004. **Invited Presentation**

L42. E. Ayanoglu, "Unique Technical Functional Capabilities and the New Kinds of Research They Will Enable: Networking (UCI)," Cal-$(IT)^2$ All Hands Meeting, La Jolla, CA, April 2004. **Invited Presentation**

L41. E. Ayanoglu, "Opportunities and Challenges in Communications Over the Next Decade," UCI EECS Colloquium, Irvine, CA, November 2003. **Invited Presentation**

L40. E. Ayanoglu, "The Failure of Fixed Broadband Wireless," IEEE Topical Conference on Wireless Technology and NSF Wireless Grantees Workshop, Los Angeles, CA, October 2003. **Invited Presentation**

L39. E. Ayanoglu, "Advanced Coding for IEEE 802.11a: Modified SINR Metric," International Conference on Computational and Experimental Engineering and Sciences, Corfu, Greece, July 2003.

L38. E. Ayanoglu, "Pervasive Communications and Computing Research at UC Irvine," IEEE Conference on Electronic Commerce, Irvine, CA, June 2003. **Keynote Speaker**

L37. E. Ayanoglu, "The Failure of Fixed Broadband Wireless: Where Do We Go From Here?" UCLA EE Department Colloquium, Los Angeles, CA, April 2003. **Invited Talk**

L36. E. Ayanoglu, "The Failure of Fixed Broadband Wireless: Where Do We Go From Here?" UCI HSSoE Research Review, Irvine, CA, March 2003. **Invited Presentation**

L35. E. Ayanoglu, "Technological Challenges in Communications," UCI EECS Colloquium, Irvine, CA, February 2003. **Invited Presentation**

L34. E. Ayanoglu, "Center for Pervasive Communications at UCI," Cal-$(IT)^2$ UCI Layer Leaders Meeting, La Jolla, CA, December 2002. **Invited Presentation**

L33. E. Ayanoglu, "Towards Pervasive Communications: State and Future of Fixed Wireless and Wireless LANs," Cal-(IT)[2] UCSD Division Talk, La Jolla, CA, December 2002. **Invited Talk**

L32. E. Ayanoglu, "Center for Pervasive Communications at UCI," UCI Engineering Advisory Board Meeting, Irvine, CA, October 2002. **Invited Presentation**

L31. E. Ayanoglu, S. Fisher, J. Frederick, A. Klinkert, and H. Zaghloul, "Setting Requirements and Standards for Multi-Vendor Interoperability," *Wireless Communications International 14th Annual Convention,* Boston, MA, June 2001. **Invited Panelist**

L30. E. Ayanoglu and B. Kiernan, "Standards and Industry Specifications," *Supercomm 2001,* Atlanta, GA, June 2001. **Invited Panelist**

L29. E. Ayanoglu, R. Krishnamoorthy, R. Muse, and H. Zaghloul, "Contrasting Non Line of Sight Technology Approaches," *Broadband Wireless World Forum,* San Francisco, CA, February 2001. **Invited Panelist**

L28. E. Ayanoglu, V. Hayes, D. Kostas, D. Satapathy, and H. Zaghloul, "BWA Standards for License Exempt: What Do the Options Deliver and What Are the Service Options," *Wireless Communications Association 7th Annual Technical Symposium, San Jose,* CA, January 2001. **Invited Panelist**

L27. E. Ayanoglu, E. A. Hervatic, and M. Shahar, "Layer 2 Alternatives for Broadband Wireless Access," Panel, *Supernet 2001,* San Jose, CA, January 2001. **Invited Panelist**

L26. E. Ayanoglu, "OFDM and Single Carrier Amplitude Modulation for Fixed Broadband Wireless Access," UCLA Electrical Engineering Department Seminar, Los Angeles, CA, November 2000. **Invited Talk**

L25. E. Ayanoglu, J. M. Costa, K. Krechmer, R. Marks, and R. McAllister, "Fixed Broadband Wireless Access: Technologies and Standards," Panel, *International Symposium on Advanced Radio Technologies,* Boulder, CO, September 2000. **Invited Panelist**

L24. E. Ayanoglu, D. Hendricks, A. Paulraj, R. Petroff, and H. Zaghloul, "Wireless Internet Services and Technology," Panel, *Hot Interconnects: A Symposium on High Performance Interconnect*s, Stanford, CA, August 2000. **Invited Panelist**

L23. E. Ayanoglu, "Broadband Wireless Multimedia Networking," *Wireless '99,* Calgary, Canada, July 1999. **Invited Tutorial**

L22. E. Ayanoglu, "Broadband Wireless Packet Communications," *IEEE International Communications Conference, ICC '99,* Vancouver, Canada, June 1999. **Tutorial**

L21. E. Ayanoglu, "Wireless Packet and Wireless ATM Systems," *The 8th IEEE International Symposium on Personal, Indoor, and Mobile Radio Communications,* Helsinki, Finland, September 1997. **Invited Presentation**

L20. E. Ayanoglu, "Broadband Wireless Packet Communications and Wireless ATM," *IEEE Global Communications Conference, GLOBECOM '98,* Sydney, Australia, November 1998. **Tutorial**

L19. E. Ayanoglu, "Wireless ATM," *IEEE Global Communications Conference, GLOBECOM '97,* Phoenix, AZ, November 1997. **Tutorial**

L18. E. Ayanoglu, "Wireless Packet," *IEEE International Conference on Universal and Personal Communications, ICUPC '97,* San Diego, CA, October 1997. **Tutorial**

L17. E. Karasan and E. Ayanoglu, "Performance Comparison of Reconfigurable Wavelength Selective and Wavelength Interchanging Cross-Connects in WDM Transport Networks," *ICC '97 Workshop on WDM Network Management and Control,* Montreal, Canada, June 1997.

L16. M. Alanyali and E. Ayanoglu, "Fast Wavelength Assignment in WDM Networks," *ICC '97 Workshop on WDM Network Management and Control,* Montreal, Canada, June 1997.

L15. E. Ayanoglu, "Wireless ATM," *International Conference on Mobile and Wireless Communications Networks,* Paris, France, May 1997. **Invited Tutorial**

L14. E. Ayanoglu, "Data Transmission When Sampling Frequency is More Than the Nyquist Rate," *26th IEEE Communications Society Communication Theory Committee Workshop,* Tucson, AZ, April 1997.

L13. E. Ayanoglu, "Wireless ATM: Limits, Challenges, and Proposals," *North Jersey Chapter of the IEEE Communications Society, NJIT Center for Communications and Signal Processing Research, New Jersey Center for Multimedia Research,* Newark, NJ, December 1996. **Invited Talk**

L12. E. Ayanoglu, K. Y. Eng, and M. J. Karol, "Wireless ATM: Limits, Challenges, and Proposals," *7th Maryland Workshop on Very High Speed Networks,* Baltimore, MD, November 1996. **Invited Talk**

L11. E. Ayanoglu, "Is Wavelength Conversion in WDM Networks Viable?" *7th Maryland Workshop on Very High Speed Networks,* Baltimore, MD, November 1996. **Invited Talk**

L10. E. Ayanoglu, R. Jain, S, Lam, K. K. Sabnani, H. Schulzrinne, "Are Real-Time Services on the Internet Realistic?" *IEEE International Conference on Network Protocols,* Columbus, OH, November 1996. **Invited Panelist**

L9.   E. Ayanoglu, K. Y. Eng, and M. J. Karol, "Wireless ATM: Limits, Challenges, and Proposals," *3rd International Workshop on Mobile Multimedia Communications,* Princeton, NJ, September 1996.

L8.   E. Ayanoglu, P. Pancha, A. R. Reibman, and S. Talwar, "Forward Error Control for MPEG-2 Video Transport in a Wireless ATM LAN," *3rd International Workshop on Mobile Multimedia Communications,* Princeton, NJ, September 1996.

L7. E. Karasan and E. Ayanoglu, "Wavelength Routing and Selection Algorithms for WDM Optical Networks," *ICC '96 Workshop on WDM Network Management and Control,* Dallas, TX, June 1996.

L6. E. Ayanoglu, K. Y. Eng, M. J. Karol, P. Pancha, R. A. Valenzuela, M. Veeraraghavan, C. B. Woodworth, "The BAHAMA Wireless ATM LAN," *IEEE ATM Workshop,* Washington, DC, October 1995.

L5. E. Ayanoglu, "Source and Channel Coding for Networks," *1995 IEEE Information Theory Workshop on Information Theory, Multiple Access and Queuing*, St. Louis, MO, April 1995.

L4. E. Ayanoglu, "Broadband Network Technological Discontinuity: Error, Loss, and Failure Recovery" *IEEE PCJS Communications and Consumer Electronics Societies and the Jersey Coast Sections of CAS/SP and Computer/Instrumentation Societies,* March 1995. **Invited Talk**

L3. E. Ayanoglu and M. Veeraraghavan, "Advanced Topics in Broadband ATM Networks," Tutorial, *IEEE INFOCOM '94,* Toronto, Canada, June 1994. **Tutorial**

L2. E. Ayanoglu, "Broadband Network Restoration," *Columbia Workshop on Telecommunications,* Columbia University, New York, NY, September 1992.

L1. E. Ayanoglu, "Signal Flow Graphs for Path Enumeration and Deflection Routing Analysis in Multihop Networks," *20th IEEE Communications Society Communication Theory Committee Workshop,* Rhodes, Greece, June 1991.