

Juan Manuel Romero-Jerez

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Research Areas

My research interest is in the area of wireless communications and, more specifically: wireless communications performance analysis, multipath fading, wireless channel modeling, physical layer security, diversity systems, smart antennas, MIMO performance and interference management.

Education

- Doctor in Telecommunication Engineering. April 2001. University of Malaga, Spain
- Telecommunication Engineering (five-years program), September 1995, University of Malaga, Spain
- *Licenciado* in Mathematics (five-years program), July 2012, University of Malaga, Spain

Current and Previous Academic Positions

- Full Professor, Department of Electronic Technology, University of Malaga, Spain.
- Visiting Associate Professor. Department of Electrical Engineering, Stanford University, CA, September 2005 - February 2006, September 2007 - February 2008, February 2016.

University Assignments

- Vice-Chair of the Telecommunication Research Institute (TELMA), University of Malaga (2023-present)
- Secretary of the Telecommunication Research Institute (TELMA), University of Malaga (2021-2023)

- Coordinator of the Degree in Telecommunications Technology Engineering, University of Malaga, Spain, October 2017 - present

- Coordinator of PhD Program in Telecommunication Engineering, University of Malaga, Spain, October 2010 - 2015

Projects and contracts as principal investigator

- TEC2017-87913-R Energy efficiency in secure wireless communications systems for 5G

Funded by the Spanish Government and FEDER
2018-2020

- TEC2013-42711-R Energy efficiency in cognitive radios and low power networks for enabling a sustainable development

Funded by the Spanish Government and FEDER
2014-2017

- Optimization strategies and quality of service in mobile networks

Tartessos Technologies S.A./OPTIMI (now part of Ericsson)
2004-2008

Other Professional Activities and affiliations

- General Co-Chair of the 2022 IEEE Communication Theory Workshop, Marbella, Spain

- Editor IEEE Transactions on Wireless Communications (2015 - 2020)

- Senior Member of the IEEE (Institute of Electrical and Electronic Engineers)

- Reviewer for the following Journals:

- IEEE Communications Magazine (2008 - present)
- IEEE Communications Letters (2000 - present)
- IEEE Wireless Communications Letters (2013 - present)
- IEEE Transactions on Vehicular Technology (2004 - present)
- IEEE Transactions on Communications (2006 - present)
- IEEE Transactions on Wireless Communications (2006 - present)
- IEEE Transactions on Information Theory (2008 - present)
- IEEE Transactions on Signal Processing (2013 - present)
- IEEE Journal on Selected Areas in Communications (2009)
- IEE Proceedings Communications (2008 - present)
- International Journal of Communication Systems (2013 - present)
- International Journal of Antennas and Propagation (2014)
- IEEE Transactions on Cognitive Communications and Networking (2022)

- IEEE Transactions on Green Communications and Networking (2021)
- TPC/reviewer for the following conferences:
- 2023 IEEE International Conference on Communications
 - 2023 IEEE Vehicular Technology Conference - Spring
 - 2021 IEEE Vehicular Technology Conference - Spring
 - 2018 IEEE International Conference on Communications
 - 2016 IEEE Wireless Communications and Networking Conference
 - 2014 IEEE International Conference on Communications
 - 2013 IEEE International Conference on Communications
 - 2013 IEEE Wireless Communications and Networking Conference
 - 2009 IEEE Vehicular Technology Conference - Spring

Publications

Journal papers

- M. Olyaei, H. Hashemi, Juan M. Romero-Jerez, "A Tractable Statistical Representation of IFTR Fading with Applications", accepted for publication in IEEE Transactions on Communications, 2024.
- J. D. Vega Sánchez, F. J. Lopez-Martinez, J.F. Paris, J. M. Romero-Jerez, "The Multi-Cluster Fluctuating Two-Ray Fading Model," IEEE Transactions on Wireless Communications, vol. 23, no. 5, pp. 4199–4213, May 2024.
- M. Olyaei, M. Eslami, K. Navaie, J. M. Romero-Jerez, H. Hashemi, J. Haghghat, M. Bahmanpour, "The Effect of Sand and Dust Storms (SDSs) and Rain on the Performance of Cellular Networks in the Millimeter Wave Band", IEEE Access, vol. 11, pp. 69252–69262, Jul. 2023.
- M. Olyaei, J. A. Cortés, F. J. Lopez-Martinez, J. F. Paris, and J. M. Romero-Jerez, "The Fluctuating Two-Ray Fading Model with Independent Specular Components", IEEE Transactions on Vehicular Technology, vol. 72, no. 5, pp. 5533–5545, May 2023.
- M. Olyaei, Juan M. Romero-Jerez, F. Javier Lopez-Martinez, and Andrea J. Goldsmith, "Alternative Formulations for the Fluctuating Two-Ray Fading Model," IEEE Transactions on Wireless Communications, vol. 21, no. 11, pp. 9404–9416, Nov. 2022.
- J. M. Romero-Jerez, F.J. Lopez-Martinez, J. P. Peña-Martin and A. Abdi, "Stochastic Fading Channel Models with Multiple Dominant Specular Components", IEEE Transactions on Vehicular Technology, vol. 71, no. 3, pp. 2229–2239, Mar. 2022.
- J. López Fernández, P. Ramírez Espinosa, J. M. Romero-Jerez and F.J. Lopez-Martinez, "A Fluctuating Line-of-Sight Fading Model with Double-Rayleigh Diffuse Scattering", IEEE Transactions on Vehicular Technology, vol. 71, no. 1, pp. 1000 - 1003, Jan. 2022.

- U. Fernandez-Plazaola, L. Moreno-Pozas, F.J. Lopez-Martinez, J.F. Paris, E. Martos-Naya, J.M. Romero Jerez, "A Tractable Product Channel Model for Line-of-Sight Scenarios", *IEEE Transactions on Wireless Communications*, vol. 19, no. 3, pp. 2107–2121, Mar. 2020.
- S. K. Yoo, P. C. Sofotasios, S. L. Cotton, S. Muhaidat, F. J. Lopez-Martinez, J. M. Romero-Jerez, G. K. Karagiannidis, "A Comprehensive Analysis of the Achievable Channel Capacity in F Composite Fading Channels", *IEEE Access*, Vol. 7, pp. 34078–34094, Feb. 2019.
- J. P. Peña-Martin, J. M. Romero-Jerez and F. J. Lopez-Martinez, "Generalized MGF of the Two-Wave with Diffuse Power Fading Model with Applications", *IEEE Transactions on Vehicular Technology*, vol. 67, no. 6, pp. 5525–5529, Sep. 2018.
- J. P. Peña-Martin, J. M. Romero-Jerez and F. J. Lopez-Martinez, "Generalized MGF of Beckmann Fading with Applications to Wireless Communications Performance Analysis", *IEEE Transactions on Communications*, vol. 65, no. 9, pp. 3933–3943, Sep. 2017.
- C. Tellez-Labao, J. P. Peña-Martin and J. M. Romero-Jerez, "Analysis of Correlated MRC with Transmit Antenna Selection under η - μ Fading", *IEEE Transactions on Vehicular Technology*, vol. 66, no. 9, pp. 7653–7662, Sep. 2017.
- F. J. Lopez-Martinez, J. F. Paris and J. M. Romero-Jerez, "The κ - μ Shadowed Fading Model with Integer Fading Parameters", *IEEE Transactions on Vehicular Technology*, vol. 66, no. 9, pp. 8580–8584, Sep. 2017.
- J. M. Romero-Jerez, F. J. Lopez-Martinez, J. F. Paris and A. Goldsmith, "The Fluctuating Two-Ray Fading Model: Statistical Characterization and Performance Analysis", *IEEE Transactions on Wireless Communications*, vol. 16, no. 7, pp. 4420–4432, Jul. 2017.
- J. M. Romero-Jerez, F.J. Lopez-Martinez, "A New Framework for the Performance Analysis of Wireless Communications under Hoyt (Nakagami-q) Fading", *IEEE Transactions on Information Theory*, vol.63, no. 3, pp. 1693–1702, March 2017.
- F. J. Lopez-Martinez, J. M. Romero-Jerez and J. F. Paris, "On the Calculation of the Incomplete MGF with Applications to Wireless Communications", *IEEE Transactions on Communications*, vol.65, no. 1, pp. 458–469, January 2017.
- F. J. Lopez-Martinez, J. M. Romero-Jerez, "Asymptotically Exact Approximations for the Symmetric Difference of Generalized Marcum-Q Functions," *IEEE Transactions on Vehicular Technology*. vol. 64, no. 5, pp. 2154–2159, May 2015.

- J. P. Peña-Martin, J. M. Romero-Jerez, and C. Tellez-Labao, "Performance of Selection Combining Diversity in η - μ Fading Channels with Integer Values of μ ," IEEE Transactions on Vehicular Technology. vol. 64, no. 2, pp. 834–839, Feb. 2015.
- J. P. Peña-Martin, J. M. Romero-Jerez, "An Analytical Study of the Impact of Arbitrary Receive Antenna Correlation in TAS/MRC," International Journal of Antennas and Propagation. Volume 2014 (2014), Article ID 798015.
- J. P. Peña-Martin, J. M. Romero-Jerez, and C. Tellez-Labao, "Performance of TAS/MRC wireless systems under Hoyt fading channels," IEEE Transactions on Wireless Communications, vol. 12, no. 7, pp. 3350–3359, Jul. 2013.
- J. M. Romero-Jerez and J. P. Pena-Martin, "ASER of rectangular MQAM in noise-limited and interference-limited MIMO MRC systems," IEEE Wireless Communications Letters, vol. 1, no. 1, pp. 18–21, Feb. 2012.
- J. P. Peña-Martin, J. Romero-Jerez, G. Aguilera, and A. Goldsmith, "Performance comparison of MRC and IC under transmit diversity," IEEE Transactions on Wireless Communications, vol. 8, no. 5, pp. 2484–2493, May 2009.
- J. M. Romero-Jerez and A. Goldsmith, "Performance of multichannel reception with transmit antenna selection in arbitrarily distributed Nakagami fading channels," IEEE Transactions on Wireless Communications, vol. 8, no. 4, pp. 2006–2013, Apr. 2009.
- J. M. Romero-Jerez and A. J. Goldsmith, "Receive antenna array strategies in fading and interference: an outage probability comparison," IEEE Transactions on Wireless Communications, vol. 7, no. 3, pp. 920–932, Mar. 2008.
- J. M. Romero-Jerez, J. P. Peña-Martin, and A. J. Goldsmith, "Outage probability of MRC with arbitrary power cochannel interferers in Nakagami fading," IEEE Transactions on Communications, vol. 55, no. 7, pp. 1283–1286, Jul. 2007.
- J. P. Peña-Martin and J. M. Romero-Jerez, "Outage probability with MRC in presence of multiple interferers under Rayleigh fading channels," IEE Electron. Letters, vol. 40, no. 14, pp. 888–889, Jul. 2004.
- J. M. Romero-Jerez, C. Tellez-Labao and A. Diaz-Estrella, "Effect of Power Control Imperfections on the Reverse Link of Cellular CDMA Networks Under Multipath Fading," IEEE Transactions on Vehicular Technology, vol. 53 pp. 61–71, Jan. 2004.
- J. M. Romero-Jerez, M. Ruiz-Garcia, and A. Diaz-Estrella, "Interference Statistics of Cellular DS/CDMA Systems with Base Station Diversity under Multipath Fading," IEEE Transactions on Wireless Communications, vol. 2, pp. 1109–1113, Nov. 2003.

- M. Ruiz- Garcia, J. M. Romero-Jerez, C. Tellez-Labao and A. Diaz-Estrella, "Average Block Error Probability of Multicell CDMA Packet Networks with Fast Power Control under Multipath Fading," IEEE Communications Letters, vol. 6, pp. 538–540, Dec. 2002.
- C. Tellez-Labao, J. M. Romero-Jerez and A. Diaz-Estrella, "Capacity Estimation of a SIR-Based Power Controlled CDMA System with Base Station Diversity in a Multipath Fading Environment," IEEE Communications Letters, vol. 6, pp. 373–375, Sep. 2002.
- J. M. Romero-Jerez, M. Ruiz-Garcia and A. Diaz-Estrella, "Effect of Constrained Fast Power Control on Cellular DS-CDMA Systems with Base Station Diversity," IEE Electronics Letters, vol 38, pp. 385–387, Apr. 2002.
- M. Ruiz-Garcia, J. M. Romero-Jerez, and A. Diaz-Estrella, "Quality of Service Support of MAC Protocols for Multimedia Traffic in UTRA," IEE Electronics Letters, vol. 38 pp.139–141, Jan. 2002.
- J. M. Romero-Jerez, M. Ruiz Garcia, and A. Diaz Estrella, "Effects of multipath fading on BER statistics in cellular CDMA networks with fast power control," IEEE Communications Letters, vol. 11, no. 4, pp. 349–351, Nov. 2000.
- J. M. Romero-Jerez, M. Ruiz Garcia, and A. Diaz-Estrella, "Impact of Multipath Fading on Throughput in a Cellular Packet CDMA System", IEE Electronics Letters, vol. 36, pp. 256–258. Feb. 2000.

Conference papers

- M. Olyaei, J. M. Romero-Jerez, M. Eslami, H. Hashemi, "Effect of Sand and Dust Storms on the Coverage of Cellular Networks in the Millimeter Wave Band", Proc. IEEE International Mediterranean Conference on Communications and Networking (MeditCom), Dubrovnik, Croatia, Sep. 2023.
- M. Olyaei, José A. Cortés, F. Javier Lopez-Martinez, José F. Paris, Juan M. Romero-Jerez, "The IFTR Fading Model: Statistical Characterization and Empirical Validation", in Proc. IEEE International Conference in Communications (ICC 2023), Rome, Italy, May 2023.
- M. Olyaei, J. P. Peña-Martín, F. J. Lopez-Martinez, J. M. Romero-Jerez, "Statistical Characterization of the Multicenter Two-Wave Fading Model," in Proc. The 5th International Conference on Advanced Communication Technologies and Networking (CommNet), Dec. 2022.
- M. Olyaei, J. M. Romero-Jerez, F. J. Lopez-Martinez, and A. J. Goldsmith, "Composite IG/FTR channel performance in wireless communication systems," in Proc. IEEE 33rd Annu. Int. Symp. Pers., Indoor Mobile Radio Commun. (PIMRC), Sep. 2022.

- A. Tarrias-Munoz, J.M. Romero-Jerez, F.J. Lopez-Martinez, "On the Effect of Random Power Availability in Wireless Power Transfer Systems with Physical Layer Security", XXXIV URSI National Symposium 2019, Seville, Spain, Sep 2019.
- P. Sofotasios, S.K. Yoo, S. Muhaidat, S.L. Cotton, F.J. Lopez-Martinez, J.M. Romero-Jerez, G. Karagiannidis, "Effective Rate over F-Composite Fading Channels", 2019 IEEE Wireless Communications and Networking Conference (WCNC), Marrakech, Morocco, April 2019.
- F. J. López-Martínez; L. Moreno-Pozas; U. Fernández-Plazaola, José F. Paris, E. Martos-Naya; J. M. Romero-Jerez, "A Tractable Line-of-Sight Product Channel Model: Application to Wireless Powered Communications," 15th International Symposium on Wireless Communications Systems (ISWCS 2018), Lisbon, Portugal, Aug. 2018.
- J. P. Peña-Martin, J. M. Romero-Jerez and F.J. Lopez-Martinez, "Analysis of Energy Detection of Unknown Signals under Beckmann Fading Channels," Proc. IEEE 85th Vehicular Technology Conference: (VTC'2017-Spring), Sydney, Australia, June 2017.
- J. M. Romero-Jerez, F.J. Lopez-Martinez, J. F. Paris and Andrea Goldsmith, "The Fluctuating Two-Ray Fading Model for mmWave Communications," to appear in Proc. IEEE Globecom Workshops , Washington DC, Dec. 2016.
- J. M. Romero-Jerez and F.J. Lopez-Martinez, "Fundamental Capacity Limits of Spectrum-Sharing in Hoyt (Nakagami-q) Fading Channels," in Proc. IEEE 84th Vehicular Technology Conference (VTC'2016-Fall) , Montreal, Canada, Sep. 2016.
- J. P. Peña-Martin, C. Tellez-Labao and J. M. Romero-Jerez, "Impact of fading severity and receive antenna correlation on TAS/MRC under Nakagami fading," in Proc. 2016 International Conference on Computing, Networking and Communications (ICNC), Feb. 2016.
- J. M. Romero-Jerez and F.J. Lopez-Martinez, "On the Distribution of the Squared Norm of Non-Circular Complex Gaussian Random Variables with Applications," in Proc. IEEE International Symposium on Information Theory (ISIT 2015), Hong Kong, June 2015.
- J.M. Romero-Jerez, G. Gómez and F.J. Lopez-Martinez, "On the outage probability of secrecy capacity in arbitrarily-distributed fading channels ", in Proc. European Wireless 2002, Budapest, Hungary, May 2015.
- J. P. Peña-Martin, J. M. Romero-Jerez, and J. Arellano-Millner, "Capacity analysis of adaptive transmission with MRC in arbitrarily correlated Rayleigh fading," in Proc. IEEE 74th Vehicular Technology Conference (VTC'11-Fall), , San Francisco, CA, Sep. 2011.
- J. M. Romero-Jerez and J. P. Peña-Martin, "Closed-form ASER results of rectangular QAM in MIMO MRC with arbitrary number of antennas," in Proc. IEEE International Conference in Communications (ICC'10), Cape Town, South Africa, May 2010.

- J. M. Romero-Jerez, J. P. Peña-Martin, and A. J. Goldsmith, "Bit error rate analysis in MIMO channels with fading and interference," (invited) in Proc. IEEE 69th Vehicular Technology Conference (VTC'09-Spring), Barcelona, Spain, Apr. 2009.
- J. M. Romero-Jerez and A. J. Goldsmith, "Exact error rates of MRC with transmit antenna selection in nonidentically distributed Nakagami fading channels," in Proc. IEEE Global Communications Conference (GLOBECOM'08), New Orleans, LA., Dec. 2008.
- J. M. Romero-Jerez and A. J. Goldsmith, "Antenna array processing in fading and interference: An interference-cancellation vs. diversity performance comparison," in Proc. IEEE International Conference in Communications (ICC'07), Glasgow, U.K., Jun. 2007.
- J. M. Romero-Jerez, J. P. Peña-Martin, G. Aguilera, and A. J. Goldsmith, "Performance of MIMO MRC systems with co-channel interference," in Proc. IEEE International Conference on Communications (ICC'06), pp. 1343–1349. Istanbul, Turkey, Jun. 2006.
- J. M. Romero-Jerez, J. P. Peña-Martin, A. Porrás-Galvez, and M. Ruiz-García, "Outage probability of EGC under co-channel interferers with arbitrary powers in Rayleigh fading," in Proc. IEEE 39th Asilomar Conference on Signals, Systems and Computers, Oct. 2005.
- M. J. Rodríguez-Ortiz, Margarita Ruiz-García and J. M. Romero-Jerez, "Effects of Imperfect SIR-Based Power Control on the CDMA Cellular System Capacity," 9th WSEAS International Conference on Communications, Athens, Greece, Jul. 2005.
- M. Ruiz-García, J. M. Romero-Jerez and C. Tellez-Labao, "Analytical Capacity Evaluation of CDMA Networks with SIR-Based Power Control and Poisson Distributed Interference," 9th WSEAS International Conference on Communications, Athens, Greece, Jul. 2005.
- J. P. Peña-Martin and J. M. Romero-Jerez, "Outage probability with maximal ratio combining in the presence of multiple interferers under Rayleigh and Nakagami fading channels," in Proc. IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC'04), Barcelona, Spain, Sep. 2004.
- C. Tellez-Labao, J. M. Romero-Jerez and M. Ruiz-García, "Cellular multicode CDMA capacity with SIR-based power control in a multipath fading environment," in Proc. IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC'04), Barcelona, Spain, Sep. 2004.
- M. Ruiz García, J. M. Romero-Jerez, F. Bravo-Encinas and C. Tellez Labao, "Forward link capacity analysis of CDMA systems," in Proc. IEEE International Symposium on

Personal, Indoor and Mobile Radio Communications (PIMRC'04), Barcelona, Spain, Sep. 2004.

- J. M. Romero-Jerez, C. Tellez-Labao and M. Ruiz-Garcia, "Effects of Macrodiversity on Cellular CDMA Networks with Fast Power Control under Multipath Fading," in Proc. IEEE International Conference on Communications (ICC'04), Paris, France, Jun. 2004.

- C. Tellez-Labao, J. M. Romero-Jerez and A. Diaz-Estrella, "Capacity Analysis of SIR-Based Power Controlled CDMA Systems under Multipath Fading," in Proc. IEEE International Symposium on Personal, Indoor and Mobile Radio Communications (PIMRC'02), Lisbon, Portugal, Sep. 2002.

- J. M. Romero-Jerez, M. Ruiz-Garcia and C. Tellez-Labao and A. Diaz-Estrella, "Capacity Analysis of Multicell CDMA Networks with Fast Power Control under Multipath Fading", in Proc. European Wireless 2002, Florence, Italy, Feb 2002.

- M. Ruiz Garcia, J. M. Romero-Jerez and A. Diaz-Estrella, "Access Control Scheme for QoS Provisioning in UTRA," in Proc. European Wireless 2002, Florence, Italy, Feb. 2002.

- M. Ruiz-Garcia, C. Tellez-Labao, J. M. Romero-Jerez, J. E. Burgos-Lati and A. Diaz-Estrella "Performance of common channel access in UTRAN," in Proc. 10th Mediterranean Electrotechnical Conference (MELECON'2000). Cyprus, May 2000.

- M. Ruiz-Garcia, J. E. Burgos-Lati, J. M. Romero-Jerez and A. Diaz-Estrella, "Capacity analysis of Wideband CDMA systems", in Proc. International Switching Symposium (ISS'2000), Birmingham, U.K., May 2000.

- M. Ruiz-Garcia, J. E. Burgos-Lati, J. M. Romero-Jerez and A. Diaz-Estrella, "Capacity analysis of an integrated wideband CDMA system ", in Proc. IEEE/AFCEA EUROCOMM'2000, Munich, Germany, May 2000.

- M. Ruiz-Garcia, J. E. Burgos-Lati, J. M. Romero-Jerez and A. Diaz-Estrella, "Multiaccess strategies in an integrated UTRA system," in Proc. Fifth IEEE Symposium on Computer & Communications (ISCC'2000), Antibes, France, Jul. 2000.

- J. M. Romero-Jerez, M. Ruiz Garcia, and A. Diaz-Estrella, "Effects of Power Control Errors and Multipath Fading on BER in a Cellular CDMA System," in Proc. IEEE Vehicular Technology Conference (VTC'00 - Fall), Boston, MA, Oct. 2000.

- J. M. Romero-Jerez, M. Ruiz Garcia, and A. Diaz-Estrella, "Performance Analysis of a Cellular Slotted CDMA System with Imperfect Power Control over a Rayleigh Fading Channel", Multiaccess, Mobility and Teletraffic in Wireless Communications, E. Biglieri, L. Fratta, B. Jabbari Eds., pp. 253-262, Kluwer Academic Publishers, 1999.