

David Ramírez García

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Born in Santander, Spain, 28 May 1983

Education

Ph.D. in Telecommunication Engineering. Dissertation title: “Detection and Estimation of Time Series using a Multi-sensor Array”. *Summa cum laude* (with honors). Univ. de Cantabria. July 2011
B.Sc. & M.Sc. in Telecommunication Engineering. Univ. de Cantabria. July 2006

Academic employment

- Associate Professor (“Profesor Titular”). Univ. Carlos III de Madrid. Feb. 2019 – Present
- Assistant Professor (“Profesor Visitante”). Univ. Carlos III de Madrid. Sept. 2015 – Feb. 2019
- Tenured Assistant Professor (“Akademischer Rat”). Univ. Paderborn. Nov. 2013 – Aug. 2015
- Research Associate (“Wissenschaftlicher Mitarbeiter”). Univ. Paderborn. Sept. 2011 – Oct. 2013
- Research Assistant (FPU grant). Univ. de Cantabria. May 2007 – April 2011
- Contract Researcher. Univ. de Cantabria. Feb. 2007 – Mar. 2007
- Contract Researcher. Univ. de Cantabria. Nov. 2006 – Dec. 2006

Research interests

- Statistical signal processing: Detection and estimation
- Change-point management: Detection, classification, . . .
- Signal processing on graphs
- Signal processing for wireless communications

Prizes and awards

- 2012 Young Author Best Paper Award by the IEEE Signal Processing Society for the paper “Detection of Spatially Correlated Gaussian Time Series”, co-authored by D. Ramírez, J. Vía, I. Santamaría and L. L. Scharf and published by the IEEE Transactions on Signal Processing, vol. 59, issue 8, pp. 3764–3774, August 2010

- Certificate of Merit awarded by the IEEE Signal Processing Society “for outstanding editorial board service for the IEEE Transactions on Signal Processing”, 2020
- 2013 Extraordinary Ph.D. Award by the University of Cantabria for the Thesis “Detection and Estimation of Time Series using a Multi-sensor Array”

Teaching experience

Universidad Carlos III de Madrid

- Lectures and Tutorials for Digital Communications. 2015–2021
- Lectures and Tutorials for Statistical Signal Processing. 2019–2021
- Lectures and Tutorials for Signal Processing in Communications. 2015–2019
- Tutorials for Applications of Digital Signal Processing to Transmission. 2016–2019
- Tutorials for Advanced Techniques in Signal Processing and Communications. 2015–2016
- Supervision for one Bachelor’s Thesis

Universität Paderborn

- Tutorials for Statistical Signal Processing. 2011–2015
- Tutorials for Probability for Engineers. 2011–2015
- Students supervision in Topics in Signal Processing. 2011–2012 & 2013–2014
- Projects supervision. 2012–2015
- Supervision/Co-Supervision for one Bachelor’s Thesis and three Master’s Theses

Universidad de Cantabria

- Lectures (substituting I. Santamaría) for Digital Signal Processing. 2009–2011
- Digital Signal Processing Laboratory. 2009–2010
- Signals and Systems (laboratory). 2010–2011
- Co-supervision for two Master’s Theses

Current PhD students

- Stefanie Horstmann. Univ. of Paderborn. Since 2016
Advisor: Peter J. Schreier. Co-Advisor: David Ramírez.
- Pablo Bonilla. Univ. Carlos III de Madrid. Since 2018
Advisor: Antonio Artés. Co-Advisor: David Ramírez.
- Patricia Carretero. Univ. Carlos III de Madrid. Since 2019
Advisor: David Ramírez. Co-Advisor: Antonio Artés.

Visiting researcher

- Department of Mathematics of the Colorado State University, USA.
Dates: 7 – 13 November 2014. Topic: Detection of cyclostationary time series in multi-sensor arrays
- Department of Statistical Science of the University College London, United Kingdom.
Dates: 29 September – 3 October 2014. Topic: The localized monogenic signal
- Department of Statistical Science of the University College London, United Kingdom.
Dates: 8 – 12 April 2013. Topic: A localized measure of unidirectionality
- Department of Statistical Science of the University College London, United Kingdom.
Dates: 13 – 17 February 2012. Topic: A measure of unidirectionality
- Signal and System Theory group of the University of Paderborn, Germany.
Dates: 14 – 25 March 2011. Topic: The random monogenic signal
- Electronic Technology and Communications group of the University of Coruña, Spain.
Dates: 25 – 29 October 2010. Topic: Experimental evaluation of interference alignment under imperfect channel state information
- Electronic Technology and Communications group of the University of Coruña, Spain.
Dates: 30 June – 08 July 2010. Topic: Building a multiterminal MIMO platform and initial experiments on interference alignment
- Signal Processing in Communications group of the University of Vigo, Spain.
Dates: 31 May – 4 June 2010. Topic: Detection of multiple primary users in cognitive radio networks
- Signal Processing Microelectronics group of the University of Newcastle, Australia.
Dates: 13 October – 14 December 2009. Topic: New measures of linear correlation and mutual information in the frequency domain

Selected research projects

Public funding

- David Ramírez, Detection of behavioral changes and its application in psychiatry. Comunidad de Madrid. Feb. 2019 – Jan. 2022
- David Ramírez, Change-point management: Statistical approaches and manifold learning (CAIMAN). Ministry of Economy, Industry and Competitiveness of Spain. Jan. 2018 – Dec. 2020
- David Ramírez, Peter J. Schreier, A Unifying Framework for Detecting Cyclostationarity with Applications to Cognitive Radio. German Research Foundation. Nov. 2015 – Nov. 2017

Industry funding

- David Ramírez, Joaquín Míguez, Solución de atención médica automática y personalizada para enfermedades mentales. Evidence based behavior, S. L. Jan. 2019 – Oct. 2020
- David Ramírez, Joaquín Míguez, Servicios de asesoramiento en el área de soluciones de tratamiento de señal y aprendizaje automático en el ámbito de la salud. Evidence based behavior, S. L. Jan. 2018 – Dec. 2021

Collaboration in funded research projects

Public funding

- Computational psychiatry and comprehensive models of behavior (PRACTICO). Comunidad de Madrid. Jan. 2019 – Dec. 2021
- Microfoundations of behavior: An ICT-based approach to understanding human behavior and interaction (aMBITION). Ministry of Economy (Spain) and ERDF (European Commission). Jan. 2019 – Dec. 2020
- Advanced Bayesian computation methods for estimation, prediction and control in multi-sensor complex systems (ADVENTURE). Ministry of Economy (Spain) and ERDF (European Commission). Jan. 2016 – Dec. 2018
- Intelligent Systems: Concepts and Applications (CASI-CAM). Comunidad de Madrid. Oct. 2014 – Sep. 2018
- Overhead-Throughput-Optimal Signaling Schemes for Next-Generation Wireless Networks (OTO-SiS). Ministry of Economy (Spain). Jan. 2014 – Dec. 2016
- Radio Access Techniques for Heterogeneous Wireless Networks (RACHEL). Ministry of Economy (Spain). Jan. 2014 – Dec. 2016
- Signal Processing for Identifying Coupled Effects in High-Dimensional Data. German Research Foundation. Aug. 2014 – Aug. 2017
- Nonparametric Techniques for Analyzing Directional Structure in Space-Time Random Fields. German Research Foundation. Aug. 2013 – Aug. 2015
- Computational Inference in High Dimensional Random Complex Systems (COMPREHENSION). Ministry of Economy (Spain). Jan. 2013 – Dec. 2015
- Cooperative and cognitive strategies for interference management in wireless communication networks (COSIMA). Ministry of Science and Innovation (Spain). Jan. 2011 – Dec. 2013
- Foundations and Methodologies for Future Communication and Sensor Networks (COMONSENS). Ministry of Science and Innovation (Spain). Dec. 2008 – Dec. 2013
- Advanced MIMO systems for maximum reliability and performance (MIMAX). European Commission. Seventh Research Framework Program. Jan. 2008 – Dec. 2010
- MIMO technologies for multiterminal wireless networks (MultiMIMO). Ministry of Education and Science (Spain). Oct. 2007 – Sept. 2010

- Development and hardware demonstration of new transmission techniques for MIMO systems (MIMESIS). Ministry of Education and Science (Spain). Dec. 2004 – Dec. 2007

Industry funding

- Asesoramiento y Gestión para la industrialización del sistema de control y medida Sayme. Consultora y Software Innova S.L. Sept. 2007 – Dec. 2007
- Integration of Radio-Transceivers Multistandard in an SDR Plataform. Advanced Communication Research and Development (ACORDE). Jul. 2007 – Sept. 2007

Membership or activities in professional associations

- IEEE Senior Member
- Signal Processing Society Member

Invited talks

- Power-CCA: Maximizing the correlation coefficient between the power of projections, Department of Statistical Science of the University College London, United Kingdom. 12 April 2013
- Detection of Cyclostationary Time Series in Multi-Sensor Arrays, Department of Mathematics of the Colorado State University. 12 November 2014
- Detection of Cyclostationary Time Series in Multi-Sensor Arrays, Department Signal Theory and Communications of the University Carlos III of Madrid. 1 June 2015
- Detection of Cyclostationary Time Series in Multi-Sensor Arrays, Forty-Six Years (and counting) of Statistical Signal Processing: A workshop in recognition of the career contributions of Louis Scharf. 10 November 2015

Professional service

- Associate editor of the IEEE Transactions on Signal Processing (2018– 2022)
- Publications chair of the 2018 IEEE Workshop on Statistical Signal Processing (SSP 2018)
- Member of the IEEE Technical Committee on Signal Processing Theory and Methods (2017–2022)
- Member of the EURASIP Technical Area Committee on Theoretical and Methodological Trends in Signal Processing (2022–2024)
- Co-Organizer of the 4th EURASIP-IEEE Spanish Workshop on Signal Processing, Information Theory and Communications
- Co-Organizer and Co-Chair (with J. Vía and L. Scharf) of Special Session, ICASSP 2015 “Theory and Application of Coherence in Signal Processing”

- Technical program committee member of the 2012 Workshop on Cognitive Information Processing, 2012 IEEE International Workshop on Machine Learning for Signal Processing, 2014 IEEE Symposium on Wireless Technology and Applications, 2016 IEEE GlobalSIP Symposium on Signal and Information Processing Over Networks, 2016 IEEE Global Conference on Signal and Information Processing, 2017 IEEE Annual International Symposium on Personal, Indoor, and Mobile Radio Communications (MAC and Cross-Layer Design), 2017 IEEE GlobalSIP Symposium on Graph Signal Processing, 2018 IEEE Workshop on Statistical Signal Processing (SSP 2018), 26th European Signal Processing Conference (EUSIPCO 2018), 2020 IEEE Statistical Signal Processing Workshop (SSP 2020)
- Chair or co-chair of 7 sessions in the main signal processing conferences (ICASSP, Asilomar, SSP)
- External reviewer for tenure and promotion evaluation

I usually review/reviewed for:

- IEEE Transactions on Signal Processing, IEEE Transactions on Information Theory, IEEE Transactions on Audio, Speech and Language Processing, IEEE Transactions on Wireless Communications, IEEE Transactions on Communications, Transactions on Biomedical Engineering, IEEE Signal Processing Letters, EURASIP Journal on Wireless Communications and Networking, IET Electronic Letters, IET Signal Processing, IET Communications, Applied and Computational Harmonic Analysis, Transactions on Vehicular Technology, Wireless Networks, Journal of Visual Communication and Image Representation, Digital Signal Processing, IEEE Communications Letters, Signal Processing, IEEE Transactions on Intelligent Transportation Systems, Mobile Networks and Applications, The Annals of Statistics, IEEE Transactions on Green Communications and Networking
- First Wireless Euro-Mediterranean International Conference (WEMIC 2006), Mosharaka Multi-Conference on Communications, Networking and Information Technology (MM-CNIT 2007), IEEE 67th Vehicular Technology Conference (VTC 2008 Spring), 8th International Conference on Independent Component Analysis and Signal Separation (ICA 2009), IEEE Symposium on Personal, Indoor, Mobile and Radio Communications 2009 & 2010 (PIMRC), IEEE International Conference on Communications (ICC 2011), IEEE symposium on Computers and Communications (ISCC 2011), Third International Workshop on Cognitive Information Processing (CIP 2012), 19th International Conference on Systems, Signals and Image Processing (IWSSIP 2012), 2012 IEEE International Workshop on Machine Learning for Signal Processing (MLSP 2012), 21st International Symposium on Mathematical Theory of Networks and Systems (MTNS 2014), The Eighth IEEE Sensor Array And Multichannel Signal Processing Workshop (SAM 2014), 2014 European Signal Processing Conference (EUSIPCO 2014), 2014 International Telecommunications Symposium, the Eleventh International Symposium on Wireless Communication Systems (ISWCS 2014), 2015 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP 2015), the Twelfth International Symposium on Wireless Communication Systems (ISWCS 2015), The 2016 IEEE Workshop on Statistical Signal Processing (SSP 16), The Ninth IEEE Sensor Array and Multichannel Signal Processing Workshop (SAM 16), 2017 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP 2017), 2017 IEEE Global Conference on Signal and Information Processing (GLOBALSIP 2017), 2017 IEEE International Workshop on Computational Advances in Multi-Sensor Adaptive Processing (CAMSAP 2017), 2018 IEEE International Conference on

Acoustics, Speech and Signal Processing (ICASSP 2018), the 2018 IEEE Workshop on Statistical Signal Processing (SSP 18), 2018 IEEE Global Conference on Signal and Information Processing (GLOBALSIP 2018), 2019 IEEE Data Science Workshop (DSW 2019), 27th European Signal Processing Conference (EUSIPCO 2019), 2019 IEEE Global Conference on Signal and Information Processing (GLOBALSIP 2019), 2020 IEEE International Symposium on Information Theory (ISIT 2020), 28th European Signal Processing Conference (EUSIPCO 2020), 2021 Asilomar Conference on Signals, Systems, and Computers (Asilomar 2021)

University service

- Academic Secretary in the Department of Signal Theory and Communications of the Universidad Carlos III de Madrid (2019–Present)
- Member of the Appointments Committee of the Department of Signal Theory and Communications of the Universidad Carlos III de Madrid for non-tenured positions (2020–Present)
- I served on the following Ph.D. Committees:
 - Sadiq Ali, “Multi-sensor detection schemes using spatio-temporal models”, Ph.D. Dissertation, Department of Telecommunications and Systems Engineering, Universitat Autònoma de Barcelona.
 - Julio César Manco Vásquez, “Experimental evaluation of new detection techniques for cognitive radio”, Ph.D. Dissertation, Department of Communications Engineering, Universidad de Cantabria.
 - Javier Zazo Ruiz, “Nonconvex quadratic problems and games with separable constraints”, Ph.D. Dissertation, Department of Signals, Systems, and Radiocommunications, Universidad Politécnica de Madrid.
 - Grace Silvana Villacrés Estrada, “Capacity limits of bursty interference channels”, Ph.D. Dissertation, Department of Signal Theory and Communications, Universidad Carlos III de Madrid.
 - Jacobo Fanjul Fernández, “Analysis and experimental evaluation of flexible duplexing for multi-tier MIMO networks”, Ph.D. Dissertation, Department of Communications Engineering, Universidad de Cantabria.
 - Vaibhav Garg, “Subspace-based order estimation techniques in massive MIMO”, Ph.D. Dissertation, Department of Communications Engineering, Universidad de Cantabria.

Selected publications

International journals

J. Pérez, J. Vía, L. Vielva, and D. Ramírez. Online detection and SNR estimation in cooperative spectrum sensing. *IEEE Trans. Wireless Comm.* (To appear), 2021.

D. Ramírez, A. G. Marques, and S. Segarra. Graph-signal reconstruction and blind deconvolution for structured inputs. *Signal Process. (Special issue on Processing and Learning over Graphs)*, 188:108180, November 2021.

- P. Moreno-Muñoz, D. Ramírez, and A. Artés-Rodríguez. Change-point detection in hierarchical circadian models. *Pattern Recognition*, 113:107820, May 2021.
- P. Bonilla-Escribano, D. Ramírez, A. Porras-Segovia, and A. Artés-Rodríguez. Assessment of variability in irregularly sampled time series: Applications to mental healthcare. *Mathematics (Special issue on Recent Advances in Data Science)*, 9(1), 2021.
- I. Santamaría, L. L. Scharf, and D. Ramírez. Scale-invariant subspace detectors based on first- and second-order statistical models. *IEEE Trans. Signal Process.*, 68:6432–6443, 2020.
- S. Horstmann, D. Ramírez, and P. J. Schreier. Two-channel passive detection of cyclostationary signals. *IEEE Trans. Signal Process.*, 68:2340–2355, 2020.
- D. Ramírez, I. Santamaría, L. L. Scharf, and S. Van Vaerenbergh. Multi-channel factor analysis with common and unique factors. *IEEE Trans. Signal Process.*, 68:113–126, 2020.
- P. Bonilla-Escribano, D. Ramírez, A. Sedano-Capdevila, J. J. Campaña-Montes, E. Baca-García, P. Courtet, and A. Artés-Rodríguez. Assessment of e-social activity in psychiatric patients. *IEEE J. Biomedical and Health Informatics*, 23(6):2247–2256, November 2019.
- V. Garg, I. Santamaría, D. Ramírez, and L. L. Scharf. Subspace averaging and order determination for source enumeration. *IEEE Trans. Signal Process.*, 67(11):3028–3041, June 2019.
- A. Eguizabal, C. Lameiro, D. Ramírez, and P. J. Schreier. Source enumeration in the presence of colored noise. *IEEE Signal Process. Lett.*, 26(3):475–479, March 2019.
- S. Berrouiguet, D. Ramírez, M. L. Barrigón, P. Moreno-Muñoz, R. Carmona, E. Baca-García, and A. Artés-Rodríguez. Combining continuous smartphone native sensors data capture and unsupervised data mining techniques for behavioral changes detection: A case series of the Evidence-Based Behavior (eB2) study. *JMIR mHealth and uHealth (Special issue on Computing and Mental Health)*, 6(12):e197, December 2018.
- D. Ramírez, D. Romero, J. Vía, R. López-Valcarce, and I. Santamaría. Testing equality of multiple power spectral density matrices. *IEEE Trans. Signal Process.*, 66(23):6268–6280, December 2018.
- S. Horstmann, D. Ramírez, and P. J. Schreier. Joint detection of almost-cyclostationary signals and estimation of their cycle period. *IEEE Signal Process. Lett.*, 25(11):1695–1699, November 2018.
- A. Pries, D. Ramírez, and P. J. Schreier. LMPIT-inspired tests for detecting a cyclostationary signal in noise with spatio-temporal structure. *IEEE Trans. Wireless Comm.*, 17(9):6321–6334, September 2018.
- Y. Song, P. J. Schreier, D. Ramírez, and T. Hasija. Canonical correlation analysis of high-dimensional data with very small sample support. *Signal Process.*, 128:449–458, November 2016.
- D. Ramírez, P. J. Schreier, J. Vía, I. Santamaría, and L. L. Scharf. Detection of multivariate cyclostationarity. *IEEE Trans. Signal Process.*, 63(20):5395–5408, October 2015.
- S. Ali, D. Ramírez, M. Jansson, G. Seco-Granados, and J. A. López-Salcedo. Multi-antenna spectrum sensing by exploiting spatio-temporal correlation. *Eurasip J. Adv. Signal Process.*, 160, 2014.
- S. C. Olhede, D. Ramírez, and P. J. Schreier. Detecting directionality in random fields using the monogenic signal. *IEEE Trans. Inform. Theory*, 60(10):6491–6510, October 2014.
- S. Dähne, V. V. Nikulin, D. Ramírez, P. J. Schreier, K.-R. Müller, and S. Haufe. Finding brain oscillations with power dependencies in neuroimaging data. *NeuroImage*, 96:334–348, 2014.

J. Manco-Vásquez, M. Lázaro-Gredilla, D. Ramírez, J. Vía, and I. Santamaría. A Bayesian approach for adaptive multiantenna sensing in cognitive radio networks. *Signal Process.*, 96, Part B:228–240, March 2014.

D. Ramírez, P. J. Schreier, J. Vía, and I. Santamaría. Testing blind separability of complex Gaussian mixtures. *Signal Process.*, 95:49–57, February 2014.

D. Ramírez, J. Vía, I. Santamaría, and L. L. Scharf. Locally most powerful invariant tests for correlation and sphericity of Gaussian vectors. *IEEE Trans. Inform. Theory*, 59(4):2128–2141, April 2013.

V. Pichler, M. Homolák, W. Skierucha, M. Pichlerová, D. Ramírez, J. Gregor, and P. Jaloviar. Variability of moisture in coarse woody debris from several ecologically important tree species of the temperate zone of Europe. *Ecohydrology*, 5(4):424–434, July 2012.

D. Ramírez, G. Vazquez-Vilar, R. López-Valcarce, J. Vía, and I. Santamaría. Detection of rank- P signals in cognitive radio networks with uncalibrated multiple antennas. *IEEE Trans. Signal Process.*, 59(8):3764–3774, August 2011.

J. Gutiérrez, Ó. González, J. Pérez, D. Ramírez, L. Vielva, J. Ibáñez, and I. Santamaría. Frequency-domain methodology for measuring MIMO channels using a generic test bed. *IEEE Trans. Instrum. Meas.*, 60(3):827–838, April 2011.

D. Ramírez, J. Vía, I. Santamaría, and L. L. Scharf. Detection of spatially correlated Gaussian time series. *IEEE Trans. Signal Process.*, 58(10):5006–5015, October 2010.

J. Vía, D. Ramírez, and I. Santamaría. Properness and widely linear processing of quaternion random vectors. *IEEE Trans. Inform. Theory*, 56(7):3502–3515, July 2010.

D. Ramírez, I. Santamaría, J. Pérez, J. Vía, J. A. García-Naya, T. M. Fernández-Caramés, H. Pérez-Iglesias, M. González-López, L. Castedo, and J. M. Torres-Royo. A comparative study of STBC transmissions at 2.4 GHz over indoor channels using a 2×2 MIMO testbed. *Wireless Comm. and Mobile Computing*, 8(9):1149–1164, November 2008.

D. Ramírez and I. Santamaría. Regularised approach to detection of constant modulus signals in MIMO channels. *Electr. Lett.*, 42(3):184–186, February 2006.

International conferences

V. Garg, D. Ramírez, and I. Santamaría. Sparse subspace averaging for order estimation. In *Proc. IEEE Work. Stat. Signal Process.*, Rio de Janeiro, Brazil, July 2021.

P. Bonilla-Escribano, D. Ramírez, and A. Artés-Rodríguez. Modeling phone call durations via switching Poisson processes with applications in mental health. In *Proc. IEEE Int. Work. Machine Learning for Signal Process.*, September 2020.

P. Moreno-Muñoz, D. Ramírez, and A. Artés-Rodríguez. Continual learning for infinite hierarchical change-point detection. In *Proc. IEEE Int. Conf. Acoustics, Speech and Signal Process.*, Barcelona, Spain, May 2020.

Y.-H. Xiao, D. Ramírez, and P. J. Schreier. A general test for the linear structure of covariance matrices of Gaussian populations. In *Proc. IEEE Int. Conf. Acoustics, Speech and Signal Process.*, Barcelona, Spain, May 2020.

P. Bonilla-Escribano, D. Ramírez, and A. Artés-Rodríguez. Mixtures of heterogeneous Poisson processes for the assessment of e-social activity in mental health. In *NeurIPS Workshop on Learning with Temporal Point Processes*, December 2019.

S. Horstmann, D. Ramírez, and P. J. Schreier. Two-channel passive detection of cyclostationary signals in noise with spatio-temporal structure. In *Asilomar Conf. Signals, Syst. and Computers*, Pacific Grove, USA, November 2019.

S. Horstmann, D. Ramírez, and P. J. Schreier. Two-channel passive detection exploiting cyclostationarity. In *Proc. Eur. Signal Process. Conf.*, A Coruña, Spain, September 2019.

D. Ramírez, I. Santamaría, S. Van Vaerenbergh, and L. L. Scharf. An alternating optimization algorithm for two-channel factor analysis with common and uncommon factors. In *Proc. Asilomar Conf. Signals, Syst. and Computers*, Pacific Grove, USA, October 2018.

A. Eguizabal, P. J. Schreier, and D. Ramírez. Model-order selection in statistical shape models. In *Proc. IEEE Int. Work. Machine Learning for Signal Process.*, Aalborg, Denmark, September 2018.

I. Santamaría, D. Ramírez, and L. L. Scharf. Subspace averaging for source enumeration in large arrays. In *Proc. IEEE Work. Stat. Signal Process.*, Freiburg, Germany, June 2018.

F. J. Iglesias, S. Segarra, S. Rey-Escudero, A. G. Marques, and D. Ramírez. Demixing and blind deconvolution of graph-diffused sparse signals. In *Proc. IEEE Int. Conf. Acoustics, Speech and Signal Process.*, Calgary, Canada, April 2018.

D. Ramírez, D. Romero, J. Vía, R. López-Valcarce, and I. Santamaría. Locally optimal invariant detector for testing equality of two power spectral densities. In *Proc. IEEE Int. Conf. Acoustics, Speech and Signal Process.*, Calgary, Canada, April 2018.

S. Horstmann, D. Ramírez, and P. J. Schreier. Detection of almost-cyclostationarity: An approach based on a multiple hypothesis test. In *Proc. Asilomar Conf. Signals, Syst. and Computers*, Pacific Grove, USA, October 2017.

D. Ramírez, A. G. Marques, and S. Segarra. Graph-signal reconstruction and blind deconvolution for diffused sparse inputs. In *Proc. IEEE Int. Conf. Acoustics, Speech and Signal Process.*, New Orleans, USA, March 2017.

T. Hasija, Y. Song, P. J. Schreier, and D. Ramírez. Bootstrap-based detection of the number of signals correlated across multiple data sets. In *Proc. Asilomar Conf. Signals, Syst. and Computers*, Pacific Grove, USA, November 2016.

Y. Song, T. Hasija, P. J. Schreier, and D. Ramírez. Determining the number of signals correlated across multiple data sets for small sample support. In *Proc. Eur. Signal Process. Conf.*, Budapest, Hungary, August 2016.

T. Hasija, Y. Song, P. J. Schreier, and D. Ramírez. Detecting the dimension of the subspace correlated across multiple data sets in the sample poor regime. In *Proc. IEEE Work. Stat. Signal Process.*, Majorca, Spain, June 2016.

A. Pries, D. Ramírez, and P. J. Schreier. Detection of cyclostationarity in the presence of temporal or spatial structure with applications to cognitive radio. In *Proc. IEEE Int. Conf. Acoustics, Speech and Signal Process.*, Shanghai, China, March 2016.

D. Ramírez, P. J. Schreier, J. Vía, I. Santamaría, and L. L. Scharf. An asymptotic LMPI test for cyclostationarity detection with application to cognitive radio (invited paper). In *Proc. IEEE Int. Conf. Acoustics, Speech and Signal Process.*, Brisbane, Australia, April 2015.

- D. Ramírez, P. J. Schreier, J. Vía, I. Santamaría, and L. L. Scharf. A regularized maximum likelihood estimator for the period of a cyclostationary process. In *Proc. Asilomar Conf. Signals, Syst. and Computers*, Pacific Grove, USA, November 2014.
- S. Dähne, V. V. Nikulin, D. Ramírez, P. J. Schreier, K.-R. Müller, and S. Haufe. Optimizing spatial filters for the extraction of envelope-coupled neural oscillations. In *Proc. Int. Work. Pattern Recognition In Neuroimaging*, Tübingen, Germany, June 2014.
- D. Ramírez, L. L. Scharf, J. Vía, I. Santamaría, and P. J. Schreier. An asymptotic GLRT for the detection of cyclostationary signals. In *Proc. IEEE Int. Conf. Acoustics, Speech and Signal Process.*, Florence, Italy, May 2014.
- D. Ramírez, P. J. Schreier, J. Vía, and V. V. Nikulin. Power-CCA: Maximizing the correlation coefficient between the power of projections. In *Proc. IEEE Int. Conf. Acoustics, Speech and Signal Process.*, Vancouver, Canada, May 2013.
- D. Ramírez, P. J. Schreier, J. Vía, and I. Santamaría. GLRT for testing separability of a complex-valued mixture based on the strong uncorrelating transform. In *Proc. IEEE Int. Work. Machine Learning for Signal Process.*, Santander, Spain, September 2012.
- S. C. Olhede, D. Ramírez, and P. J. Schreier. The random monogenic signal. In *Proc. IEEE Int. Conf. Image Process.*, Orlando, Florida, USA, September 2012.
- D. Ramírez, J. Iscar, J. Vía, I. Santamaría, and L. L. Scharf. The locally most powerful invariant test for detecting a rank- P Gaussian signal in white noise. In *Proc. IEEE Sensor Array and Multichannel Signal Process. Work.*, Hoboken, NJ, USA, June 2012.
- J. Manco-Vásquez, M. Lazaro-Gredilla, D. Ramírez, J. Vía, and I. Santamaría. Bayesian multiantenna sensing for cognitive radio. In *Proc. IEEE Sensor Array and Multichannel Signal Process. Work.*, Hoboken, NJ, USA, June 2012.
- D. Ramírez, J. Vía, and I. Santamaría. The locally most powerful test for multiantenna spectrum sensing with uncalibrated receivers. In *Proc. IEEE Int. Conf. Acoustics, Speech and Signal Process.*, Kyoto, Japan, March 2012.
- G. Vazquez-Vilar, D. Ramírez, R. López-Valcarce, J. Vía, and I. Santamaría. Spatial rank estimation in cognitive radio networks with uncalibrated multiple antennas (invited paper). In *Proc. Int. Conf. on Cognitive Radio and Advanced Spectrum Management*, Barcelona, Spain, October 2011.
- G. Vazquez-Vilar, D. Romero, R. López-Valcarce, D. Ramírez, J. Vía, I. Santamaría, and J. Sala. Recent advances in multiantenna spectrum sensing: complexity, noise uncertainty, and signal rank issues. In *Int. Work. COST Action IC0902*, Barcelona, Spain, October 2011. Extended abstract.
- J. A. García-Naya, L. Castedo, Ó. González, D. Ramírez, and I. Santamaría. Experimental evaluation of Interference Alignment under imperfect channel state information. In *Proc. Eur. Signal Process. Conf.*, Barcelona, Spain, September 2011.
- D. Ramírez, J. Vía, I. Santamaría, and L. L. Scharf. Multi-sensor beamsteering based on the asymptotic likelihood for colored signals. In *Proc. IEEE Work. Stat. Signal Process.*, Nice, France, June 2011.
- D. Ramírez, G. Vazquez-Vilar, R. López-Valcarce, J. Vía, and I. Santamaría. Multiantenna detection under noise uncertainty and primary user's spatial structure. In *Proc. IEEE Int. Conf. Acoustics, Speech and Signal Process.*, Prague, Czech Republic, May 2011.

D. Ramírez, J. Vía, I. Santamaría, and L. L. Scharf. Multiple-channel detection of a Gaussian time series over frequency-flat channels. In *Proc. IEEE Int. Conf. Acoustics, Speech and Signal Process.*, Prague, Czech Republic, May 2011.

Ó. González, D. Ramírez, I. Santamaría, J. A. García-Naya, and L. Castedo. Experimental validation of Interference Alignment techniques using a multiuser MIMO testbed. In *Proc. Int. ITG Work. on Smart Antennas*, Aachen, Germany, February 2011.

D. Ramírez, J. Vía, and I. Santamaría. Multiantenna spectrum sensing: The case of wideband rank-one primary signals. In *Proc. IEEE Sensor Array and Multichannel Signal Process. Work.*, Israel, October 2010.

J. Vía, D. Ramírez, I. Santamaría, and L. Vielva. Improperness measures for quaternion random vectors. In *Proc. IEEE Int. Work. Machine Learning for Signal Process.*, Finland, August 2010.

D. Ramírez, J. Vía, I. Santamaría, R. López-Valcarce, and L. L. Scharf. Multiantenna spectrum sensing: Detection of spatial correlation among time-series with unknown spectra. In *Proc. IEEE Int. Conf. Acoustics, Speech and Signal Process.*, Dallas, USA, March 2010.

J. Vía, D. Ramírez, I. Santamaría, and L. Vielva. Widely and semi-widely linear processing of quaternion vectors. In *Proc. IEEE Int. Conf. Acoustics, Speech and Signal Process.*, Dallas, USA, March 2010.

D. Ramírez, J. Vía, and I. Santamaría. Coherent fusion of information for optimal detection in sensor networks. In *Proc. IEEE Work. Stat. Signal Process.*, Cardiff, UK, September 2009.

D. Ramírez, J. Vía, I. Santamaría, and P. Crespo. Entropy and Kullback-Leibler divergence estimation based on Szegő's theorem. In *Proc. Eur. Signal Process. Conf.*, Glasgow, Scotland, August 2009.

I. Santamaría, V. Elvira, J. Vía, D. Ramírez, J. Pérez, J. Ibáñez, R. Eickhoff, and F. Ellinger. Optimal MIMO transmission schemes with adaptive antenna combining in the RF path. In *Proc. Eur. Signal Process. Conf.*, Lausanne, Switzerland, August 2008.

D. Ramírez, J. Vía, and I. Santamaría. Multiple-channel signal detection using the generalized coherence spectrum. In *Proc. IAPR Work. Cognitive Information Process.*, Santorini, Greece, June 2008.

D. Ramírez, J. Vía, and I. Santamaría. A generalization of the magnitude squared coherence spectrum for more than two signals: Definition, properties and estimation. In *Proc. IEEE Int. Conf. Acoustics, Speech and Signal Process.*, Las Vegas, USA, April 2008.

J. A. García-Naya, T. M. Fernández-Caramés, H. J. Pérez-Iglesias, M. González-López, L. Castedo, D. Ramírez, I. Santamaría, J. Pérez, J. Vía, and J. M. Torres-Royo. Performance of STBC transmissions with real data. In *Proc. IST Mobile & Wireless Comms. Summit*, Budapest, Hungary, July 2007.

D. Ramírez, I. Santamaría, J. Pérez, J. Vía, A. Tazón, J. A. García-Naya, T. M. Fernández-Caramés, M. González-López, H. J. Pérez-Iglesias, and L. Castedo. A flexible testbed for the rapid prototyping of MIMO baseband modules. In *Proc. Int. Symp. on Wireless Comm. Systems*, Valencia, Spain, September 2006.

J. Vía, I. Santamaría, J. Pérez, and D. Ramírez. Blind decoding of MISO-OSTBC systems based on principal component analysis. In *Proc. IEEE Int. Conf. Acoustics, Speech and Signal Process.*, Toulouse, France, May 2006.